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P. Cargini, **F. Ritenuti**, E. Costabile, T. Bourelaki, T. Cutilli

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Growth pattern of oral cancer trauma related: histopathological observations

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Nicotinamide N-Methyltransferase as effective diagnostic tool and promising therapeutic target for oral cancer

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Peculiar Chromosomal Instability in Oral Verrucous Carcinoma

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Prevention and treatment of BRONJ in osteoporotic patients with oral bisphosphonate therapy

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Sapphire plus lesion detection system: a new diagnostic instrument for the prevention of malignant tumors in the oral cavity

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Spontaneous and multifocal ONJ risedronate-linked in patient with corticosteroids-induced osteoporosis: case report

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Tongue dysplasia by induced dental trauma: proposal of a morpho-protective device to prevent the progression oral cancer

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Vanilloid and cannabinoid receptors in tongue of burning mouth syndrome patients

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A Literature Review about the management of postoperative pain in patients undergoing surgical extraction: drugs compared

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Ablative Erbium laser: treatment of difficult surgical approach keratosis

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Akt and Aromatase polymorphisms predict the risk of bisphosphonate-related osteonecrosis of the jaws in patients

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Assessing the relation between the inferior alveolar nerve and the third inferior molar: report of two cases

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Dental extractions in bisphosphonates therapy patients associated with LLLT: a protocol for the prevention of BRONJ

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Effectiveness of an ozonized essential oil (Oleozone) as adjunctive in non surgical periodontal therapy. A pilot study

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R. Mercantini, F. Musto, A. Beretta, G. Ferretti, R. Roncucci, R. Grimaldi

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Valutazione del sigillo marginale degli adesivi Self-etch:effetti delle variazioni di pH

I. Giannantoni, H. Ghasri, F. Mezzacapo, R. Smin Minasi, N. Pljevljak, G. Giacobelli, M. Galli

Visual and instrumental assessment of the efficacy of an "in office" whitening system

M. Tocchi, A. Vichi, S. Grandini, M. Ferrari

CLINICAL CASES

Abnormal development and including ectopia: two case reports

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Aim. Presentation of 2 clinical cases with coronal anomaly and anomaly location.

Methods. We report 2 cases that developed as a result of facial trauma between 2 and 3 years of age. A P. 14 years of age reported at the age of 34-month a facial trauma with edema of the third medium. When observed, 6.3 had no signs of root resorption, it was clear the ectopia of 2.3 horizontally above the palatal floor. The second P. reported at the age of 25 months a facial trauma with intrusive displacement of 6.1. The 2.1 has surfaced one year after the 1.1 and presents structural abnormality of the crown and of the root.

Results. The different stages of the trauma led to two different effects: inclusion with ectopia and partial inclusion with structural alteration.

Conclusions. A first diagnostic indication may be made by 5 years with rx. It would allow a more accurate medical-legal assessment. The beginning of the curative/compensatory treatment may still be late and requires further investigation.

Visualization of biofilm colonization in parotid gland hypofunction

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Aim. to investigate the bacterial colonization of the biofilm on enamel, dentin and restorative materials in patients with Parotid gland hypofunction.

Methods. Bovine slabs were treated with the following dental materials: Universal Dentin Sealant; Protect Bond self etching system; Teethmate F-1; Vertise flow. Untreated dentin and enamel were used as controls. Slabs were mounted buccally on individual splints and carried in situ by six subjects with parotids gland hypofunction for 120 min, in comparison to a healthy group; then, slabs were rinsed, and adherent bacteria were investigated under TEM, and cultural methods.

Results. Independently by the hypo-salivation and the materials used, bacteria were detected on biofilm formed at the slab surface of the molars teeth areas. Mean number of adherent bacteria was in the range of $< 10^3$.

Conclusions. Data suggest that neither the Parotid gland hypofunction nor restorative materials have influence in the initial microflora colonization, suggesting that other factors may justified the high incidence of decay during hypo-salivation diseases. This study was supported by Fondazione Banco di Sardegna.

DENTAL MATERIALS

3D-Microtomography evaluation of marginal sealing on composite restorations using five different adhesive systems

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Aim. In restored dental cavity it's possible to predict the presence of gaps due to polymerization shrinkage. This work has been proposed to reveal by 3D images and measure by microCT analysis the gaps generate after polymerization during dental restoration procedures/practice. Five adhesive systems for dental restoration have been studied by in-vitro analysis and their performance evaluation is done by means of 3D microtomography technique (3D microCT).

Methods. In this experimental work have been selected five sound human crown teeth, from patients ranging 30 to 50 years old, all restored with the same composite material, using five different adhesive systems (TECO (DMG, Germany), Adper Scotchbond SE (3M ESPE, USA), CONTAX (DMG, Germany), Adper Scotchbond 1 XT (3M ESPE, USA), Bond - 1 SF PENTRON CLINICAL All-in-one (Pentron Clinical Technologies LLC, USA). After about 48 hours each tooth has been acquired by means of Skyscan mod.1072 microCT instrument and successively processed by 3D reconstruction and microCT analyser software to display and evaluate gaps obtained after polymerization shrinkage.

Results. In table 1 have been showed the obtained values of the tooth plus material volumes (V_{tot}), the only material volumes (V_m) and the gap volumes (V_g).

Table 1: microCT analysis results.

Materials	V_{tot} (mm ³)	V_m (mm ³)	V_g (mm ³)
TECO	406,94 + 0,01	42,43 + 0,01	0,80 + 0,01
AdperScotchbondSE	641,44 + 0,01	88,24 + 0,01	0,27 + 0,01
CONTAX	414,34 + 0,01	55,32 + 0,01	2,67 + 0,01
AdperScotchbond1XT	499,55 + 0,01	96,59 + 0,01	1,00 + 0,01
Bond - 1 SF	490,06 + 0,01	67,91 + 0,01	0,02 + 0,01

Two adhesive systems have showed by 3D microCT images and analysis not as much gaps as expected, with a very little extent (sample 5 and 2).

Conclusions. This proposal of microtomography evaluation for restoration interface gaps seem to be an innovative and very useful technique that can substitute the traditional SEM investigations used until now, even if the tooth sample cutting and treatment for SEM observations surely causes alterations like gaps or creeps on the same sample. Further in-vitro 3D microCT analysis on several samples is needed to validate the proposed gap evaluation method by statistical evaluation.

Assessment of the e-learning sustainability by analysis of educational process of students coming to the admission test to the faculty of Dentistry and Medicine

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Aim. Our study wanted to assess the actual sustainability and effective dissemination of e-learning on a significant target of users to affirm if this method of learning is considered valid and effective.

Methods. We analyzed a sample of 350 high school students (220 females and 130 males between 18 and 20 years) in Brescia (high school science) oriented to take the admission test to Dentistry and Medicine faculties. We submitted a questionnaire to the sample in order to investigate the use of PC for training and the order of importance in the use of technological means such as video, power point presentation, sharing through platforms (social networks), audio, Skype. We then calculated the percentage of use of the means employed.

Results. The entire sample responded positively to the use of PC for learning. 23% of subjects reported using Skype or other media to exchange information. 82% of subjects usually uses social networks to information exchange, but not for learning in the strict sense. Learning itself is given to media such as books, video and audio files as well as websites dedicated to specific topics.

Conclusions. We can say the use of technology and especially the web for learning is common in people coming to university. We believe this justifies the development of platforms and web-assisted realities for the improvement of online content. We hope existing data on e-learning help to develop the quality of an area where demand appears to be increasing.

Bond strength of etch & rinse adhesive on sclerotic dentin: micro-shear bond strength test

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Aim. Literature does not yet provide clear information regarding the appropriate etching time of sclerotic dentin before the application of primer agents. The aim of this study was to measure the bond strength of an etch & rinse adhesive when applied to sclerotic dentin after different etching times.

Methods. 10 extracted human molars with sound dentin and 10 extracted human molars with loss of occlusal enamel and exposed sclerotic dentin surface due to abrasion were selected. Teeth were transversally sectioned to obtain a coronal dentin surface. Etching gel (Etching Gel, 3M ESPE) was applied to a randomly selected half part of each dentin surface for 15s and to the other half part for 30s. A 2-step etch & rinse adhesive system (Scotchbond 1XT, 3M ESPE) was then applied to the surface following the manufacturer's instructions. Composite build-ups (Tetric Flow, Ivoclar-Vivadent) were constructed (n=6 for each dentin surface) by means a custom made device. After thermo-cycling μ SBS test was performed. Data were subjected to statistical analysis.

Results. Bond strength to sound dentin was higher after etching for 15s ($16,1 \pm 7,2$ Mpa) than after etching for 30s ($9,1 \pm 6,8$ Mpa). Bond strength to sclerotic dentin was lower after etching for 15s ($11,0 \pm 6,0$ Mpa) than after etching for 30s ($17,5 \pm 14,4$ Mpa).

Conclusions. Bonding to sclerotic dentin requires a longer etching time than bonding to sound dentin when using the etch & rinse technique.

Bone regeneration in sinus augmentation procedures with calcium sulfate evaluated under scanning, fluorescence and circularly polarized light microscopy. A human study

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Aim. Calcium sulphate (CaS) is an alloplastic material that, after resorption, leaves behind a calcium phosphate lattice which promotes bone regeneration. The aim of this study was a histological and an ultrastructural evaluation of the bone formed in human sinus augmentation procedures with CaS.

Methods. Twenty specimens retrieved from the sinus after a healing period of 6 months were investigated. SEM and energy dispersive X-ray spectroscopy (EDS) was used to evaluate the relationship between CaS and newly-formed bone. Birefringence was used to evaluate the bone structure around the CaS particles by polarized light microscopy (CPLM). Unstained sections were also investigated using the fluorescence (FM) in reflected UV light to evaluate the interface between CaS and newly-formed bone.

Results. EDS analysis of 6 specimens showed that very little sulphur remained and residual particles appear to have transformed into calcium phosphate. Under CPLM a few biomaterial remnants were present in some areas and covered by mature bone. The collagen fibers inside both mineralized bone matrix and osteoid adjacent to the particles appeared mostly randomly oriented. Under FM it was possible to observe the relationship between residual particles and bone.

Conclusions. The present results confirm the high biocompatibility, rapid resorption rate, and the mechanism of transformation of CaS to calcium phosphate.

Characterization of metal-ceramic and zirconia-ceramic prosthetic systems: microhardness at the interfaces

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Aim. mechanical properties of (1) metallic frameworks (ISO 9693:1999) in metal-ceramic systems and (2) yttria-stabilized tetragonal zirconia cores (Y-TZP, ISO 13356:2008) in "all ceramic" systems are well known as far as the feldspatic or heat-pressed veneering ceramics (ISO 6878:2008). But there is a lack of knowledge about the changes of the different materials interfaces as the result of the dental technician laboratory production procedures. Even if some studies are already available in the literature, further microhardness based studies are still required for improving the understanding of the actual clinical failure modes. The aim of this study was to apply the microhardness analysis to the interfaces of a metal-ceramic Vs. two zirconia-ceramic systems.

Methods. Plate samples (4x4x3 mm) of the three different prosthetic systems¹⁻³ were prepared in the dental lab following the manufacturer instructions, where metal-ceramic was the result of a ceramic veneering (porcelain-fused-to-metal) and the two zirconia-ceramic systems were produced by the dedicated CAD-CAM procedures of the zirconia cores (both with final sintering) and then veneered by layered or heat pressed ceramics. Knoop and Vickers microhardness (ASTM E348) indentations were performed and FEG-SEM (5KV) micrographs (1000-50000X) were acquired. Data were collected and a statistical analysis was performed (ANOVA test on average values).

Results. Despite the presence of many voids in all the ceramic layers, it was possible to measure a large number of indentations in all the materials interfaces. As an example, the average values of the different materials interfaces are reported in Tab. 1. Tab. 1 Vickers Knoop HV0,n (GPa, #) HK 100gf (GPa) IPS e.max[®] ZirCAD 11,60 ± 0,23 IPS e.max[®] ZirPRESS 5,33 ± 0,30 Will-Ceram[®] ZTM Zirconia 'K' Blocks 12,47 ± 0,22 Ceramic Avanté[®] ZTM 5,06 ± 0,08 Alloy VE[®] - 8853 - Ceramic Avanté[®] 4,43 ± 0,12 ("–": it was not possible to measure the knoop microhardness of the alloy at the alloy-ceramic interface. An explanation is referred into the text).

Conclusions. The microhardness characterization of the interfaces is useful in the definition of (1) the grain structures of the metallic and zirconia substrates and (2) the thin oxide layer at the metal-ceramic interface and its interactions with the first ceramic layer (wash technique). By the limits of this in vitro study, microhardness analysis of metal-ceramic and zirconia-ceramic systems seems to be useful in the characterization of the interfaces improving the knowledge about the interpretation of failures.

References

1. Alloy VE[®] - 8853 S.p.A. (Pero, MI, Italy) and Ceramic Avanté[®] - Pentron Ceramics Inc. (Somerset, NJ, USA).
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Cytotoxicity of light cured dental adhesives- An in vitro study

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Aim. Polymerized dental adhesives release residual monomers that may affect the vitality of pulp cells. The purpose of this study was to evaluate the cytotoxic effect of four dental adhesives (S3 Bond, DC Bond, SE Bond and Optibond Solo Plus) applied to cell cultures.

Methods. The experiments were performed on the mouse fibroblast cell line NIH-3T3. Samples of the adhesives were light-cured and placed directly in contact to cells for 24 or 48 hours. Alternatively, to obtain extracts, the adhesive samples were topped with cell culture medium for 24 hours and cells were cultivated in the extract-containing medium up to 96 hours. Cytotoxicity was evaluated by measuring: apoptosis by flow cytometry (FACS); cell proliferation by proliferation curves analysis; morphological changes by optical microscopy analysis.

Results. All the adhesive materials tested caused a decrease of cell survival by both increasing apoptosis and reducing cell proliferation. However, the apoptotic effect of Optibond Solo Plus was significantly more pronounced. Morphological alteration of treated cells was also evident, particularly in the Optibond Solo Plus treated cells. Significance. Different types of dental adhesives showed different cytotoxic effects on cells in vitro. Optibond Solo Plus was the adhesive material that showed the highest cytotoxicity against the best results of S3 Bond, probably due to their different composition. The different cytotoxic effects of dental adhesives should be considered to select an appropriate adhesive for operative restorations.

Class V resin-composite restorations using two different adhesives: prospective RCT

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Aim. To prospectively evaluate, and in vitro analyse, an etch & rinse/two-steps (E&R) adhesive and a self-etch/one-step (SE) adhesive in class V composite restorations.

Methods. 52 teeth with cervical lesions were selected from 14 patients and randomly divided in two groups: A assigned to a beginner operator, B to a dentist with 15 years experience. Groups were then randomly divided in two subgroups: E&R adhesive was used in subgroups A1 and B1 (Gluma Comfort Bond, Heraeus Kulzer), while SE in A2 and B2 (iBond, Heraeus Kulzer). Cavity margins were placed on both enamel and cement. All restorations were performed using the same composite and evaluated at baseline and 24-month (Hickel's criteria). Micro-tensile laboratory tests were performed to test the bond strength of the two adhesives, comparing in vitro Vs in vivo.

Results. No statistical difference between the clinical performance of the adhesives and the two operators. There was a statistically significant difference between baseline and 24-month follow-up, in both groups, for polishing procedure, post-op sensitivity and marginal adaptation. Under laboratory conditions, the E&R adhesive gave better results than the SE adhesive, even if statistically significant differences could only be found in terms of adhesion on enamel.

Conclusions. This study suggests that both E&R and SE adhesives can be recommended for clinical use in class V composite restorations, either for a beginner operator than for an expert one.

Comparison of three cryopreservation methods for human Dental Pulp Stem Cells and their tissues of origin for banking

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Aim. Dental Pulp Stem Cells (DPSCs) could be used for therapeutic purposes to the same patient donor, often in paediatric age. We now report results of optimized methods for cryopreservation DPSCs and their respective tissues of origin for banking and to allow further study of the potential therapeutic uses of these cells.

Methods. Once extracted and placed in antibiotic solution, 15 teeth were equally divided for testing three cryopreservation protocols: whole teeth (5 teeth), whole dental pulp tissue (5 teeth) and enzymatically digested dental pulp tissue as a cell suspension (5 teeth). Lastly, we evaluated the growth and surface markers (CD73, CD90, CD105, CD29, CD105, CD71, CD14, CD34, HLADR) properties of DPSC obtained from intact teeth, digested dental pulp tissue and whole dental tissue frozen and thawed using the optimized procedures.

Results. Cryopreservation of whole teeth with the goal of isolating DPSCs which can be expanded and used clinically is not reliable or repeatable. We also found that performing the pulp tissue digest and then cryopreserve the initial cell suspension did not provide suitable results. The optimized results with the least manipulation were achieved by isolating and cryopreserving the tooth pulp tissues, with digestion and culture performed post-thaw.

Conclusions. The optimal results with the least manipulation were achieved by isolating and cryopreserving the tooth pulp tissues, with digestion and culture performed post-thaw.

Cytotoxicity of dental cements

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Aim. A growing number of studies has shown that restorative dental materials may affect pulp cells. The aim of this study was to evaluate the cytotoxicity of dental cements AH Plus Jet (Dentsply, Germany), Sicura-Seal (Dentalica, Italy), and Aureoseal (Ogna, Italy) on the mouse fibroblast cell line NIH3T3.

Methods. NIH-3T3 cells were treated for 24 or 48 hours with a conditioned medium obtained by incubating the prepared cement samples in a DMEM culture medium in the absence and presence of serum for 24 hours. Samples were prepared according to manufacturer recommendations and placed in contact to cells. Cytotoxicity was then evaluated by analyzing cell morphology, apoptosis by staining of cells with Annexin V-FITC and flow cytometry analysis DAKO and cell proliferation determined by counting the cells for 5 consecutive days using a standard counting chamber Neubauer. Data were analysed with Statview software (Abacus-concepts) by one-factor analysis of variance and p values of less than 0.05 were considered statistically significant.

Results. All the dental cements tested exerted cytotoxic effects on NIH-3T3 cells as shown by the changes of cell morphology, the inhibition of cell proliferation and the increase of apoptosis. However, among the different cements tested, AH Plus Jet showed significant lower cytotoxicity.

Conclusions. The tested materials have a potential risk to modify the metabolism of cells when they get in physical contact because of the release some components.

Degree of conversion and depth of cure of three different flowable composites using a micro-Raman spectroscopy

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Aim. This in vitro study evaluated the degree of conversion (DC) at selected depths (top surface, 2, and 4 mm) of a range of different flowable resin-composites.

Methods. Three commercially available flowable composites were selected: SDR - Smart Dentin Replacement (Dentsply) (SDR), Tetric EvoFlow (Ivoclar-Vivadent) (TET), Vertise Flow (Kerr) (VER). Ten cylindrical composite specimens for each different thicknesses (2 and 4 mm) were prepared for each tested materials. Specimens were light-polymerized for 20 s (L.E. Demetron I, 1,200-mW/cm² output). The 2-mm specimens were then examined at top and bottom surfaces using a Labram-Dilor spectrometer (Jobin-Yvon), to evaluate the polymer conversion degree. The 4-mm specimens were analyzed in their down surfaces. Data were statistically analyzed with two-way ANOVA and Tukey's test ($\alpha = 0.05$).

Results. For all analyzed materials, no significant differences in DC values between top (SDR: 57.7 (3.4); TET: 65.3 (5.0); VER: 60.2 (4.5)) and bottom (SDR: 52.6 (2.8); TET: 60.8 (3.2); VER: 55.9 (4.1)) surfaces were found when 2 mm thick specimens were evaluated. On the contrary, significant differences within and between groups were found when the DC was evaluated at the bottom of 4 mm thick specimens (SDR: 48.6 (2.8); TET: 27.6 (2.3); VER: 38.6 (2.6)).

Conclusions. The degree of conversion is clearly dependent from depth of cure and flowable composite chosen. The SDR showed the highest conversion values at 4 mm depth.

Different origin BGMs associated to MSC: a Tissue Engineering Approach to GBR

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Aim. To evaluate the effect of different bone substitutes (BGM) on mesenchymal stem cells (MSC) differentiation in vitro and in vivo models.

Methods. Human MSCs were cultured in vitro in contact with BGMs of different origins (animal, synthetic and mixed). Cellular adhesion on BGMs was analyzed by SEM. Alkaline Phosphatase (ALP) gene expression was evaluated by real time PCR and ALP activity was determined at 7, 14 and 28 days of culture. In vivo osteogenic differentiation of implanted tissue constructs (BGM+MSC) was investigated by evaluating ectopic bone formation in immunodeficient mice and analyzed by histology.

Results. A good cell adhesion to all BGMs was observed already after 6 hours from plating and cells were successfully cultured for 28 days. ALP gene expression and enzymatic activity was detectable after 14 days of culture. MSCs cultured with BGMs derived from natural bone (BioGen, Bio-Oss) presented a steady increase of ALP expression reaching a significantly higher level at 28 days compared to the other BGMs. Cells cultured in the presence of BGMs of synthetic origin (Bonit, Skelite), presented the maximum level of ALP gene expression at day 14 with a subsequent stabilization in the expression. Cells cultured in presence of mixed origin BGMs (Pepgen P-15) presented a peak in ALP gene expression at day 7. The in vivo osteogenic test showed a good bone formation at the periphery of all BGMs particles seeded with BMSCs. Neo-formed bone progressively filled the gap between the particles bridging them after 8 weeks, maintaining a peripheral vasculature.

Conclusions. All tested BGMs implemented bone formation in Guided Bone Regeneration. BGMs of animal origin showed greater ALP expression at 28 days.

Enamel and dentin bond strength of new simplified adhesive systems with and without preliminary acid-etching

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Aim. To assess shear bond strength (SBS) to enamel (E) and dentin (D) of a self-adhering flowable composite, tested in comparison with an etch&rinse adhesive (ERA) and a new self-etch adhesive (SEA) used in combination with proprietary flowable composite; to determine the effect of preliminary etching of E and D on SBS of simplified adhesive systems.

Methods. SBS was assessed on flat buccal enamel (group E) and mid-coronal dentin (group D). Teeth from both groups were assigned to 5 subgroups (n=10): 1. (FL): ERA OptiBond FL/Premise flowable (Kerr, Orange, USA); 2. (XTR): 2 step SEA OptiBond XTR (Kerr, Orange, USA)/Premise flowable; 3. (eXTR): phosphoric acid (PA)/OptiBond XTR/Premise flowable; 4. (VF): self-adhering flowable composite Vertise Flow (Kerr, Orange, USA); 5. (eVF): PA/Vertise Flow. Specimens were stressed in shear until failure. Failure modes were evaluated under a stereomicroscope. Data were analyzed by two-way ANOVA and Fisher's exact test ($p < .05$).

Results. Dental substrate, material and between-factor interaction significantly influenced SBS. FL had significantly higher SBS to E than the other four groups, which did not differ among each other. On dentin FL performed similarly to XTR and eXTR; VF recorded significantly lower SBS. Failure modes within groups differed significantly.

Conclusions. The self-adhering composite measured low SBS on dentin. The new SEA performed better on D than on E. Preliminary etching did not significantly influence SBS.

Factors Influencing Depth of Cure of NanoHybrid Composite: Micro F-TIR Analysis

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Aim. The aim of this in vitro study was to evaluate the depth of cure of a nanohybrid resin composite irradiated with an halogen lamp with different irradiation time and energy densities and composite's temperature.

Methods. A commercially available nanohybrid resin composite (Venus Diamond, Heraeus Kultzer, Hanau, Germany) was selected for this study. The resin composite was bulk placed inside a metal device which allowed the depth of cure examination. Semicircular samples 10 mm depth were obtained, with a later flat surface parallel to the curing light direction. A total of 48 samples were prepared and divided in different groups which differed for: pre-heated composite (20° or 50°), energy density (400mW/cm²; 2000mW/cm²) and curing time (10 sec; 40 sec). The curing device employed in this study was a halogen light (Swiss Master Light, EMS, Switzerland). The degree of conversion (DC) was accomplished by Micro Attenuated Total Reflection Fourier Transform Infrared (ATR F-TIR) analysis 24 hours after the polymerization. DC was get every 0,25mm along the lateral surface of the sample. Sufficient depth of cure was considered at the level where DC was 80% of the maximum DC of each sample. Differences among groups were analyzed with the non-parametric Mann-Whitney U test (p<0,05).

Results. The descriptive analysis showed that ISO 4049 revealed a mean depth of cure of 3480 microns, while DC evaluation evidenced that 80% value of maximum DC obtained was placed at 1965 microns from the surface exposed to curing light.

Conclusions. Within the limits of this in vitro study the depth of cure was not influenced by the temperature of the composite (p=0,725). Energy density and curing time are both important in obtaining sufficient curing depth. The increase of light energy density and curing time could give high values of depth of cure, which could clinically allow to increase the thickness of composite layers during restorations.

Influence of 2% Chlorhexidine on the Bond Strength of a Self-adhesive Cement

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Aim. The aim of this study was to evaluate the effect of CHX pre-treatment on bond strength a self-adhesive cement used to lute fiber posts to intra-radicular dentin. The hypothesis tested was that CHX pre-treatment does not affect bond strength after aging.

Methods. Rebilda Post (VOCO) were luted with a self-adhesive cement (Bifix SE, VOCO) into human incisor roots, with or without pre-treatment of the intra-radicular dentin with 2% CHX applied for 1 min and carefully air-dried before self-adhesive cement application. Bonded specimens were sectioned in 1 mm-thick slabs and either immediately submitted to push-out bond strength test or stored in artificial saliva at 37C° for 1 year prior testing. Data were statistically analyzed with Kruskaal-Wallis test ($p=0.05$).

Results. Bond strength values were significantly reduced after one year in both groups ($p<0.05$); CHX pre-treatment did not affect push-out bond strength of luted specimens, both immediately and after aging in artificial saliva for 1 year. Means and standard deviations of push-out bond strength expressed as MPa:

Time	0	1 year
Bifix SE without CHX	7.2(3.3)a	5.8(2.3)b
Bifix SE with CHX	6.9(3.5)a	5.2(1.9)b

Different superscript letters indicate statistical differences ($p<0.05$).

Conclusions. The results confirmed the tested hypothesis since CHX used as a therapeutic primer did not influence the bond strength values of fiber posts luted with Bifix SE after aging.

Influence of preliminary phosphoric acid etching on microleakage of a self-etch adhesive and of a self-adhesive flowable composite

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Aim. To evaluate in vitro the influence of a preliminary etching step on microleakage of a self-adhesive flowable composite and of a self-etch adhesive using the scanning electron microscope (SEM).

Methods. Twenty sound human molars were collected for the study. Standard class V cavities were prepared on the buccal side of each tooth. Cavities were about 1,5mm deep, 4 mm in diameter, with the center positioned at the cement-enamel junction. Specimens were randomly divided into 5 groups according to the tested materials. Group 1: Gel Etchant (E) /Optibond FL/Premise Flowable (P); Group 2: Vertise Flow (V); Group 3: E/V; Group 4: Optibond XTR (X)/P; Group 5: E/X/P. Sealing ability the materials was evaluated by dye penetration (50% weight silver-nitrate aqueous solution) and SEM analysis. Each tooth was sectioned at 3 levels in the mesiodistal direction. On each section, the degree of dye penetration along the margins of the restoration was assessed using a score, and the between-material differences in the leakage at either the enamel or the dentin interface were evaluated for statistical significance (Kruskal-Wallis ANOVA, Mann-Whitney U test, $p < 0.05$).

Results. At the enamel interface, no significant differences were found among the materials. On dentin E/V had the highest leakage scores and the difference was statistically significant.

Conclusions. A preliminary acid etching step negatively influenced the dentin sealing ability of a self-adhesive flowable composite.

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Results. At the enamel interface, no significant differences were found among the materials. On dentin E/V had the highest leakage scores and the difference was statistically significant.

Conclusions. A preliminary acid etching step negatively influenced the dentin sealing ability of a self-adhesive flowable composite.

Isotopic analysis of teeth for forensic medicine

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Aim. To determine the place of birth and growth of an individual studying the molecular structure of one of his teeth extracted.

Aim. Tooth enamel, the hardest substance in our body has a durable cover for softer dentine underneath. Both materials consist mainly of calcium phosphate, but differ in how they are formed. The enamel is mineralized just before the eruption of the tooth; the dentin and bone, however, re-formed continuously throughout life. Thus, in times and places where food and water are supplied locally, the tooth enamel of individuals bearing the isotopic marking of the place of birth and early life. The isotopes in bone and dentin instead reflect the latest features from the house.

Methods. The isotopes studied were lead, strontium-87, barium and oxygen. The element of interest is extracted, purified and then introduced into a mass spectrometer. For measurements of O18 / O16, it's sufficient just a mass spectrometer for isotope standard. Instead, determine the $^{87}\text{Sr}/^{86}\text{Sr}$ requires the use of mass spectrometer of Fullagar.

Results and conclusions. The natural variations in the rates of the isotopes are detectable in the tooth enamel and can indicate where a person spent the first years of his life, comparing the results with the values of the reference groups. Investigations based on the isotopes within the dental tissues are a great useful tool for investigations in forensic medicine.

Mechanical characterization of zirconia

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Aim. The aim of the present study is to analyze how surface roughness and staining affect the mechanical strength of zirconia-based ceramic materials, which are used to produce fixed dental prostheses utilizing CAD/CAM technologies. The type of failure of eight commercially available ceramics for aesthetic coating of zirconia structures was compared by mechanical testing of bi-material samples (zirconia/coating). Finally, hardness variation of zirconia and ceramics was evaluated after 120 days in a simulated physiological environment.

Methods. The mechanical strength of a commercially available zirconia-based ceramic material (Bio ZS Blank, Kavo Everest[®]) was evaluated using a three-point bending test (ISO 6872). Besides, the mechanical properties of eight types of "aesthetic coating" ceramics were analyzed by three-point bending test of zirconia/coating samples and by Vickers microhardness measurements. These measurements were repeated after maintaining the materials under simulated physiological conditions, such as artificial saliva (Oralbalance[®], Laclade) at 37° C, with the aim of evaluating the evolution of surface hardness after implantation into the oral cavity.

Results and conclusions. We achieved interesting results, which suggested that surface roughness of zirconia samples has significant effects on their mechanical strength, while the staining procedure does not produce significant variations in strength. Consequently, ceramic dental prostheses should be manufactured very carefully, to obtain surfaces with low values of roughness and without defects. Zirconia/coating samples underwent the mechanical test, which showed different types of failure among the selected ceramics. The main causes of these failures were the different levels of adhesion between zirconia and coating ceramics. Finally, a general hardness decrease was noticed after the first 30-day exposure to the simulated physiological environment, even though variations were within 10%. No significant variations were noticed 30 and 120 days after exposure.

NiCl₂ alters cytokine secretion of RAW 264.7 macrophages

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Aim. Ni-alloy corrosion has been extensively documented and several studies have shown that nickel ions can be released during corrosion. The aim of this study was to evaluate the effect of nickel ions on the secretion of cytokines by macrophages.

Methods. RAW 264.7 macrophages were exposed to NiCl₂ (0-2 mM) for 6, 24 and 48h, and cell survival was determined by a crystal violet assay. To analyze the production of cytokines, cells were exposed to NiCl₂ (0.1, 0.25 and 0.5 mM) in the presence and absence of the bacterial endotoxin lipopolysaccharide LPS (0.1, 10 or 25 µg/ml). The production of interleukin-1β (IL-1β), interleukin-6 (IL-6), interleukin-10 (IL-10) and tumor necrosis factor-α (TNF-α) was determined using ELISA kits. Data from at least four independent experiments were statistically analyzed (Mann-Whitney U-test, p<0.05).

Results. LPS concentrations caused a time- and dose-dependent increase of cytokines secretion with a wide variation depending on the cytokine. NiCl₂ alone up-regulated IL-6 and TNF-α between 20 and 40 fold, while, in cells stimulated by LPS, NiCl₂ was effective only on IL-1β. Moreover, NiCl₂ inhibited the LPS-induced expression of all cytokines except for IL-1β.

Conclusions. Our results show that nickel chloride is able to induce cytokines secretion, but a high concentration may selectively impair cytokines production of macrophages stimulated by LPS.

Selective Laser Melting (SLM). Multicenter evaluation of dimensional stability of 4-unit posterior metal-ceramic bridges and ceramic-metal bonding

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Aim. S. 1) Evaluation of dimensional stability of metal substructures of 4-unit posterior metal-ceramic bridges. 2) Evaluation of thermal compatibility between alloy and ceramic. 3) Evaluation of ceramic-metal bonding. Evaluation involved 5 different dental laboratories. MATERIALS AND

Methods. Metal substructures and specimens were made by 3D fast Company of Padova (Italy), via Selective Laser Melting of cobalt-chromium alloy SP2 (EOS, Germany). Each laboratory was provided with: a) a metal substructure for a 4-unit posterior bridge whose marginal fit had been assessed on metal and stone models of reference; b) two metal substructures for 4-unit posterior bridges; c) 5 metal specimens to test ceramic-metal bonding. Each laboratory completed the bridges and specimens using currently employed ceramic material. Dimensional stability was assessed under the stereomicroscope by measuring the extent of marginal gaps of bridges before and after the application of ceramics. Thermal compatibility was assessed by letting two bridges undergo ten thermal cycles for firing ceramics. Adhesion was assessed as indicated by the UNI EN ISO 9693 standard.

Results. In all tests performed, dimensional stability and thermal compatibility proved to be very satisfactory and ceramic-metal bonding was well above the minimum required by standard.

Conclusions. Selective Laser Melting procedures can produce 4-unit posterior metal-ceramic bridges which are clinically satisfactory with regard to dimensional stability, thermal compatibility and ceramic-metal bonding.

Shear Bond Strength Test of different materials and surface treatments for ceramic repair

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Aim. To evaluate the shear bond strength (SBS) of 4 different composite systems in combination with 3 different surface treatments for adhesion to CAD/CAM ceramic blocks.

Methods. 10 CAD/CAM ceramic Triluxe Blocks (Vita, D) were selected. Combinations of surface treatments (Sandblasting 100 μ m/ 4ATM [S] and Hydrofluoric acid Etching 9% [H]) and Composite materials (Vertise Flow (Kerr,USA) [VF], Optibond Solo Plus + Premise Flow (Kerr,USA) [OPF], Premise Flow (Kerr,USA) [PF]) were tested. Porcelain Repair Kit (Ultradent, USA) [PRK] was used as control. 5 sample were prepared for each group using a mold fixed on the ceramic block surface. SBS test was performed and values were calculated in MPa.

Results. Group 1: H/VF=19,28 \pm 2,78; Group 2: S-H/VF=17,60 \pm 1,77; Group 3: S/VF=5,35 \pm 3,94; Group 4: H/OPF=13,99 \pm 2,48; Group 5: S-H/OPF=14,70 \pm 3,38; Group 6: S/OPF=5,35 \pm 2,04; Group 7: H/PF=12,96 \pm 2,56; Group 8: S-H/PF=14,20 \pm 2,67; Group 9: S/PF=2,32 \pm 1,84; Group 10 S-H/PRK=8,59 \pm 3,27. Statistical significance was assessed with a two-way ANOVA and post hoc Tukey's test ($p = 0,001$). Significance for the surface treatments was: H[A]>S-H[A]>S[B] and for the composite systems was: VF[a]>OPF[ab]>PF[b]>PRK[c].

Conclusions. The adhesion method based on the use of Hydrofluoric acid etch and Vertise Flow showed statistically significant higher bond strength values than all the other combination tested. This could be pivotal for repairing procedures of the CAD/CAM ceramic material tested.

Shear bond strength to enamel and flexural strength of different fiber reinforced composites

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Aim. The aim of this study was to assess enamel shear bond strength (ESBS) and flexural strength (FS) of different reinforcing fibers used in combination with a flowable resin composite as splinting materials.

Methods. 90 molars were randomly divided into 9 groups (n=10) based on the reinforcing fiber tested (Table 1). After enamel etching, Optibond FL adhesive and Premise Flowable composite were applied. The reinforcing fiber was then placed in a mould and overlaid by another layer of resin composite. After 24 hours, the shear bond strength test was performed. For assessment of FS, 10 bar-shaped specimens were prepared for each group, using the same fibers tested for ESBS and a three-point bending test was performed.

Results. Data were analyzed with one-way ANOVA and Tukey test (p 0,05). The results are shown in Table 1. Values are means in MPa. Different superscripts letters label statistically significant differences.

Conclusions. ESBS and FS are improved by using reinforcing fibers in combination with resin composite. Fiber composition and pattern significantly influence ESBS and FS.

Groups: fibers tested	Shear Strength	Flexural Strength
1:Control(no fiber)	12,85 ab	87.75 a
2:Everstick Perio	4,6 a	285.35 bcd
3:Connect	14,38 bc	223,80 bc
4:RTD EXP	14,98 bcd	441,77 ef
5:Construct/Construct resin	16,01 bcd	287,62 bcd
6:Ribbond Triaxial	16,74 cd	314,41 cd
7:RTD EXP/Quartz splint resin	17,08 de	472,69 f
8:Ribbond-THM	18,59 ef	186,89 ab
9:EverStick C&B	23,24 f	370,46 de

Shear-Bond Strength of a New Restorative Material to Primary Enamel

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Aim. Shear bond strength (SBS) to deciduous enamel of a new self-adhesive flowable resin composite was compared with SBS of a conventional glass-ionomer cement (GIC) and of a flowable composite in combination with an etch-and-rinse adhesive.

Methods. A flat enamel substrate was obtained on buccal surface of 40 primary teeth by grinding with wet abrasive paper. Teeth were divided into 4 groups (n=10): OFL. Phosphoric Acid [PA]/Optibond FL/Premise Flow (Kerr); IX. Polyacrylic Acid/Fuji IX (GC); V. Vertise Flow (Kerr); PV. PA/Vertise Flow. Using rubber moulds of 3mm in diameter cylinders of restorative material were built-up over the enamel surface. A shear load (1 mm/min crosshead speed) was applied with a steel blade parallel to the bonded interface until failure. Failure mode (FM) was assessed using stereomicroscope. SBS and FM data were statistically analyzed. For SBS data One-Way ANOVA was applied followed by Tukey test ($p < 0,05$). Differences in FM distribution were assessed with chi-square test ($p < 0,05$).

Results. SBS of V was similar to that of GIC. Following PA etching the SBS of V increased significantly up to the level of OFL ($p < 0,001$). FMs did not significantly differ ($p = 0,083$).

Conclusions. PA etching preliminarily to the use of V is advisable for improved SBS to deciduous enamel.

Stress of polymerization of a new self-adhesive vs a conventional dual-cured cement

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Aim. The aim of the study was to evaluate the contraction stress of a self-adhesive vs a dual-cured cement at different intervals after polymerization initiation.

Methods. Materials tested were: Clearfil SA Cement (Kuraray) and Duolink (Bisco Inc.). Cements (N=5) were placed between two stainless steel cylinders (h=2mm) fixed to a universal testing machine (Sun 500, Galdabini) to assess shrinkage stress. Specimens were polymerized with a LED curing unit (Bluephase, Ivoclar Vivadent, 1200 mW/cm²) for 40s. The contraction force (N) generated during polymerization was continuously recorded for 6h. Contraction stress (MPa) was calculated at 10 and 30min, 1, 2 and 6h. Data were statistically analyzed by two-way ANOVA and Tukey's post-hoc test ($\alpha=0.05$).

Results. Duolink showed higher stress values than Clearfil SA Cement ($p<0.05$). Both materials reached a stress plateau after 4h.

Table 1. Value of contraction stress (in MPa) are expressed as mean \pm SD.

Stress value (MPa)	10 min	30 min	1 h	2 h	6 h
Clearfil SA Cement	1.0 \pm 0.1a	1.1 \pm 0.0a	1.2 \pm 0.0b	1.3 \pm 0.1b,c	1.4 \pm 0.1c
Duolink	3.6 \pm 0.4d	3.9 \pm 0.4d,e	4.4 \pm 0.3e	5.1 \pm 0.4e,f	5.7 \pm 0.6f

Different superscript letters indicate statistical differences ($p<0.05$)

Conclusions. Clearfil SA Cement exhibited lower stress values compared to Duolink under the tested conditions. Further investigations are needed to clarify if the self-adhesive materials may be effective in reducing the development of stress at the tooth-restoration interface.

Temperature Rise During Composites Polymerisation Using Two LED Curing Lights

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Aim. The purpose of this in vitro study was to evaluate thermal changes on of the tooth structures induced by two different light emitting diode-curing units (LED) with and or without resin polymerization.

Methods. Human first molar were randomly selected. Four thermocouples were positioned according to a Hannig & Bott modified method. Two LED lamps were tested: A: VALO (Ultradent), tested at light intensity of 1000 (20 s) or 3200 (3 s) mW/cm²; B: Starlight PRO (Mectron) tested at light intensity of 1000mW/cm² (20 s). Maximum temperature rises among the two LED light tested were analyzed using one-way analysis of variance (ANOVA).

Results. Means and standard deviations of maximum temperature increase (expressed in °C) measured at different site of tooth during composite polymerization with VALO or Starlight PRO are reported below:

Pre-curing:

1000mW/cm²

A) VALO 21,59±5,28 Starlight PRO 17,23±3,48

C) VALO 3,48±0,84 Starlight PRO 2,26±0,49

D) VALO 2,69±0,46 -Starlight PRO 1,79±0,50

E) VALO 2,47±0,94 Starlight PRO 1,22±0,40

3200mW/cm²

A) VALO 33,38 ± 7.72

C) VALO 1,01±0,08

D) VALO 1.71±1,48

E) VALO 1.52±0,79

Intra-curing:

1000mW/cm²

B) VALO 19,54±4,53 Starlight PRO 15,14±3,39

C) VALO 4,24±2,03 Starlight PRO 2,37±0,71

D) VALO 2,77±0,42 Starlight PRO 1,68±0,40

E) VALO 23.66±1.24 Starlight PRO 2.10±0.75

3200mW/cm²

B) VALO 21,68±5,63

C) VALO 2,45±1,58

D) VALO 1.05±0.43

E) VALO 1.47±0,88

Conclusions. VALO tested at light intensity of 1000mW/cm² (20 s) induced a significant increase of the pulp chamber temperature increase more compared significant respect to with VALO at light intensity of 3200 mW/cm² for 3 s.

The fragile fracture procedure on teeth extracted for orthodontic reasons as source of stem cells

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Aim. to create a protocol for the fragile fracture of teeth extracted for orthodontic reasons in order to obtain dental pulp stem cells (DPSC's) without any thermal, bacterial or physical injury and to develop a procedure which can be applied on every tooth extracted for orthodontic reason (without any sign of decay lesion).

Methods. after the selection of the tooth to be extracted it was applied a dedicated protocol of disinfection before the extraction. After the extraction the elements were transported preserving them up to 96 hours, without any relevant changing in the number and quality of the stem cells. After a morphological tooth exam we created two dedicated incisions (notch) in its enamel, in order to easily and safely apply a numerical controlled load thanks to the Instron 5848 Testing Machine. This procedure allows to obtain the fragile fracture of the tooth and to extract the pulp tissue from it without any thermal and physical injury. The so obtained tissue is ready to be analyzed and processed to extract living DPSC's.

Results. The described procedure has been applied to 18 (12 permanent and 6 exfoliated) teeth extracted for orthodontic reasons. It has been possible the extraction and cultivation of DPSC's from each element and to separate the root cells from the crown ones for a deeper analysis.

Conclusions. The described technique is a safe and efficient method to obtain vital cells from the pulp of teeth extracted for orthodontic reasons.

Thermal analysis of laser-softened gutta-percha

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Aim. A variety of gutta-percha obturation techniques exists, but different studies have shown that plasticized gutta-percha can easily be moved into canal irregularities, thus replicating the intricacies of the root canal system. It is supposed that the pink-orange colour of gutta-percha points is a target of the 980 nm diode laser (G laser-25 Galbiati); in this way the energy is mainly absorbed and converted into heat, and gutta percha softens. The aim of this work was to compare guttapercha points thermal behaviour in the commercial form (Group Control) and when they are irradiated by a 980 nm diode laser (Group Test).

Methods. All the samples were analysed by a thermogravimetric/differential thermal analyser (TG/DTA).

Results. When samples of group Test were thermally analysed, two endothermic peaks occurred; the first between 42 and 49 °C and the second between 53 and 59°C. On the contrary, during the analysis of Control samples only one endothermic peak between 53 and 59°C occurred. DISCUSSION: Both groups present the peak between 53 and 59°C which accompanies the conversion of the α -phase into amorphous gutta-percha. On the contrary the peak between 42 and 49 °C, characterizing only Group Test, corresponds to the transformation from β -gutta-percha to the α -gutta-percha.

Conclusions. The diode laser is able to heat gutta percha and this is demonstrated by the variation of its thermal properties. These results indicate that the diode laser could be used for gutta-percha softening during the endodontic obturation.

Use of disilicate of lithium in prosthetic loading of dental implants

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Aim. Prosthesis requires nowadays materials even more refined, for the esthetical point of view, but with physical properties of hardness and transparency. Such characteristics are possessed only by few materials, such as Zirconium, Aluminium oxide and Litium Disilicate (LD). The aim of this study was to test the use of LD in highly aesthetic and functional dental prostheses, demonstrating that LD possesses mechanical characteristics allowing us to use it also in posterior sectors.

Methods. 140 prosthesis elements have been manufactured by Ivoclar (Narnano, BZ, Italy), by using LD and Max Press with press fusion and implant support (50 incisors, 49 premolars, 16 canines, 25 molars) and applied in 50 different subjects. Either prostheses or supports have been clinically and radiologically checked 7, 15, 30, 180 and 365 days after implantation. Up to now we did not observe any sign of sufferance or fracture.

Conclusions. LD possesses 400 MPa of hardness and allow to make prosthesis where the distance between supports and the missing element is not higher than 9mm. Mechanical properties obtained by different tests showed a high elasticity and transparency with no toxicity. Based on our experience, LD is superior to Zirconium due to the presence of higher aesthetical properties and elasticity; moreover, thanks to the press fusion technology, is possible to obtain a more accurate marginal closure. Furthermore, there is the possibility to modify the manufacture whenever necessary, without provoking mechanic torsions or micro-fracture.

ENDODONTICS

An in vitro evaluation of the percentage of guttapercha-filled area of two endodontic techniques of shaping and filling the root canal system

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Aim. The purpose of this study was to evaluate, through the analysis of PGFA (percentage of gutta-percha filled area), the filling ability of two combined systems of shaping and filling the root canal systems. Forty monoradicular extracted teeth were selected and divided into four groups. MTwo (Sweden & Martina) and ProTaper (Maillefer) NiTi rotary instruments were used to shape the root canal system of the teeth. The filling was performed with two different obturation techniques: continuous wave of condensation or carrier based gutta-percha technique. For each tooth 4 abrasions of 1 mm thickness each were performed, starting from the apex. The 160 sections were then observed in 50x optical magnification and analyzed to obtain their PGFA. The carrier based gutta-percha technique showed higher percentage of filled area as compared to the continuous wave of condensation, but with values of peripheral seal dependent for a considerable percentage on the plastic carrier itself. For the statistical analysis test T-student was used. The purpose of this study was to evaluate in vitro the filling ability of two combined systems of shaping and filling the root canal system. Forty monoradicular extracted teeth were selected and divided into 4 groups. MTwo (Sweden & Martina) and ProTaper (Maillefer) NiTi rotary instruments were used to shape the root canal system of the teeth. The filling was performed with two different obturation techniques: continuous wave of gutta-percha condensation or carrier based guttapercha technique. This study was conducted evaluating the analysis of PGFA (percentage of gutta-percha filled area) of 4 different sections on the apical third of the root canal.

Methods. Forty monoradicular healthy teeth, extracted for orthodontic or periodontal reasons, were selected. Teeth showing - after shaping - apical diameter greater than 0.25 mm were excluded from the study. Teeth were randomly divided into 4 groups. Groups 1 and 2 were shaped with Mtwo (Sweden & Martina) Niti rotary instruments to 25/.06, groups 3 and 4 with ProTaper rotating tools (Maillefer) to the F2 instrument. Groups 1 and 3 were filled with dedicated cones and continuous wave of condensation technique with a standard quantity of sealer. Groups 2 and 4 were filled with thermoplastic carrier based technique, with the same quantity of sealer. For each element 4 abrasions of 1 mm thickness were performed, starting from the apex by a water cooling drill. The water cooling avoided the heating of guttapercha and the production of artifacts during the microscopic evaluation. The 160 sections were observed in 50x optical magnification and analyzed by calculating the PGFA to assess the percentage of the guttapercha filled area of root canals. The results obtained were processed by Student t-test to evaluate the statistically significant difference between the groups. Moreover, in group 2 and 4 the perimeter of each section of canals was calculated; it was also assessed which percentage was occupied by guttapercha or plastic carrier, in order to establish the effective sealing of the material in the carrier based guttapercha technique.

Results. Groups 1 and 2 showed PGFA respectively average values of 70% and 92%. Groups 3 and 4 presented respectively PGFA average values of 77% and 94%. There is a statistically significant difference with $p < 0.01$ between group 1 and group 2 ($P = 0.00451$) and between group 3 and group 4 ($P = 0.000008742$). There is no statistically significant difference between groups 1 and 3 and between groups 2 and 4. Analysing individually the single millimeter, the average PGFA of the 4 groups, in the first apical millimeter, is respectively 75%, 76%, 75% and 89%. There is no statistically significant difference in the 4 groups. In the second section the average of the groups is 69%, 96%, 79% and 96% with no statistically significant difference with $p < 0.01$ between group 1 and 2 ($P = 0.003346$) and between groups 3 and 4 ($P = 0.004417821$). In the third millimeter, the average of the groups is respectively 65%, 97%, 76% and 95% with no statistically significant difference with $p < 0.01$ between groups 1 and 2 ($P = 0.000948$) and group 3 and 4 ($P = 0.000827992$). In the fourth section the average of groups is respectively 73%, 99%, 79% and 96% and there is a statistically significant difference with $p < 0.001$ between groups 1 and 2 ($P = 0.008209$) and between group 3 and 4 ($P = 0.000531897$). The analysis of the perimeters of the canals shows that the total average of the perimeters covered with guttapercha in relation to the total perimeter of the canal in groups 2 and 4 is respectively 50.35% and 41.71%. There is a statistically significant difference between the two groups.

Discussion. Using the PGFA as an evaluation parameter, the carrier based guttapercha technique is able to reach higher filling values in all sections except for the first millimeter, where it is comparable to the continuous wave of condensation technique. Between the two groups, there is a statistically significant difference in all the 4 mm which were analyzed, except for the apical millimeter. Instead, as far as the three most coronal millimeters are concerned, the guttapercha shows a peripheral sealing made of bigger percentage by the plastic carrier. This compromises an effective sealing ability – as shown by the analysis of perimeters. There is no significant difference in using a NiTi rotary instrumentation or another.

Conclusions. The technique of thermoplasticized carrier based guttapercha has shown higher values of filling the root canal system as compared to those obtained from the continuous wave of condensation technique, but with values of peripheral seal assigned in considerable percentage to the plastic carrier. For this reason it is necessary to test alternative protocols in order to avoid the contact of the plastic carrier with the canal walls, which compromises the proper seal of guttapercha.

Assessment of adaptation of gutta-percha in two different obturation techniques

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Aim. The purpose of this study was to evaluate two root canal obturation techniques: Microseal vs System B.

Methods. Were collected forty premolars extracted for orthodontic reasons. The specimens were instrumented with rotary Ni-Ti instruments M-two. In the first group, the root canals were filled using the system Microseal. The size of the master cone was adjusted until it had an adequate "tug-back." In the second group, the root canals were filled using System B / Obturate II. The teeth of the two sample groups were sectioned at 2, 4 and 6 mm from working length, taking care that the sections were perpendicular to the long axis of the central channel. The electron microscope FEI Quanta 200 F is equipped with a microanalysis system that can be used to obtain quantitative and qualitative analysis to spot the materials observed. The images were then transferred to a digital optical media, imported on a 24-inch iMac and analyzed with Adobe Photoshop CS4. The pixel count of each area representative of gutta-percha, sealer or void was expressed as a percentage of the total area of the channel. Data were collected and analyzed using the Student t-test and Mann-Whitney U-test ($p < 0.05$).

Results. The sections at 2 mm from working length, both techniques have reached a high percentage of gutta-percha filling mixed with cement and empty with no results are not statistically significant (0538). In sections 4 mm from working length Microseal technique has a less uniform filling small voids and the values obtained are statistically significant (0011).

Conclusions. In light of our present research and other literature, although both are two valid methods, the method System B / obturate II seems to now be less messy for the features already mentioned in relation to technical Microseal, while leaving the operator choice of technique more acceptable to him.

Bactericidal effect in infected root canals of a new laser technique using endodontic irrigants and Er:Yag laser with subablative settings and a newly designed tip: an in vitro study

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Aim. The aim of this in vitro study was to assess the antibacterial effectiveness of a new laser technique (using an Er:YAG laser equipped with newly designed stripped and tapered tips and low energy output and pulse duration) in extracted and infected root canals.

Methods. 148 single-rooted human teeth extracted for periodontal reasons were prepared with Mtwo nichel – titanium instruments (Sweden&Martina, DueCarrare-Pd,Italy) by “simultaneous technique” up to 25.06. The apical preparation was then completed to a master apical file, Mtwo Apical 2. After preparation all canals flooded with 17% E.D.T.A., 5% sodium hypochlorite (E.D.T.A. 17% and Niclor 5, OGNA Laboratory, Muggiò - Milan, Italy) and sterile bidistilled water than were dried, autoclaved at 134°C for 17 minutes and stored until use. Ten teeth were not infected as negative control group. All the other 138 teeth were contaminated in its root canal by a pure culture of *Enterococcus faecalis* producer of biofilm (American Type Culture Collection [ATCC] 29212, Oxoid Limited, Basingstoke, Hampshire, United Kingdom) grown in brain heart infusion broth (BHI) with a concentration of 10⁸. After inoculation, all teeth were incubated at 37 °C in a CO₂ for 48 hours. After incubation time, Ten teeth were not treated and formed the positive control group, while the remaining 128 teeth were randomly divided into four experimental groups, composed of 32 teeth each treated with different irrigation and laser methods for 20 seconds.

Results. After treatment teeth exhibited bacterial growth were: 9 for group A (28,12%), 4 for group B (12,5%), 16 for group C (50%), 4 for group D (12,5%). The CFUs were compared using a Kruskal-Wallis test and Dunn's multiple comparison test. CFU count was significantly less in group A,B and D than in group C (P<0.05). However no statistical significant differences were found for comparisons between groups: A vs B; A vs D and B vs D (P>0.05).

Conclusions. In the conditions of our study, all the laser methods resulted strongly effective in decontaminate the infected root canals, without causing unfavorable temperature rises at the settings used. This subablative laser technique with a new tip may be considered a valuable tool for root canal treatment.

Biocompatibility of a New Antibiotic based Endodontic Irrigant

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Aim. Recently, endodontic irrigants based on antibiotics have been suggested to achieve a complete disinfection of root canals system. Since a root-canal irrigant should have antibacterial properties and minimal cytotoxic effects on the host tissues, the aim of this study was to compare the biocompatibility of currently used intracanal irrigants.

Methods. Mouse embryonic fibroblasts BALB 3T3 were grown in Dulbecco's minimal essential medium and exposed to increasing dilutions of 5% and 2,5% sodium hypochlorite (NaClO), 0.2% chlorhexidine and 0-5 mg/ml Tetraclean (Ogna Laboratori Farmaceutici, Italy). After 24 hours, cell viability was evaluated by MTT test. The results were expressed as the percentage of untreated cells and statistical analysis was performed by ANOVA ($p < 0.05$).

Results. All the irrigants decreased cell viability in dose related manner. Cytotoxicity based on concentrations which caused 50% inhibition of cell proliferation (ID50) were ranked as follows: 5% NaOCl (1.1 mg/ml) > 0.2% Clorexidine (1.4 mg/ml) > 2.5% NaOCl (2.0 mg/ml) > Tetraclean (2.3 mg/ml).

Conclusions. Since root-canal irrigants might reach periradicular tissues, in addition to a good antibacterial ability, they also should be biocompatible. Our results demonstrated that between the irrigants tested the antibiotic-based Tetraclean was the less cytotoxic.

Case report with a new Ni-Ti single file for the preparation of the root canal space

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Aim of this case series was to clinically evaluate the shaping ability and the clinical handling of a new Ni-Ti instrument (Reciproc, Dentsply, Italy). This systematic requires the use of only one instrument for shaping the entire root canal (R25, R40 or R50), and this instrument, being disposable, can only be used for a single patient.

Methods. 100 teeth from 82 patients needing endodontic treatment were selected for this study. All teeth were shaped with Reciproc files. In 84 cases R25 was used, in 11 cases R40 was used, in 5 cases R50 was used. The decision was based on the x-ray and clinical analysis of the dimension of the root canal before starting the endodontic procedure. If the whole canal, or part of it, was not visible, R25 was selected. If the canal was visible on the x-ray 3 different scenarios were possible. If a k-file #30 passively reached the working length (WL), R50 was selected. If the k-file #30 couldn't reach the WL, but a k-file #20 could, R40 was selected. If the k-file #20 couldn't reach the WL, R25 was selected. All cases were irrigated with 5% NaOCl and EDTA, and obturated using the "continuous wave" technique.

Results. No file separated during the case report, and in all cases a good shaping of the root canal was achieved; all cases had control X-ray after 3 months, showing signs of healing.

Conclusions. Reciproc file seem to be able to shape the root canal correctly, reducing the number of files used for a single patient.

Clinical and radiographic evaluation of three different root canal sealers

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Clinical and radiographic evaluation of three different root canal sealers.

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Aim. To evaluate from a clinical point of view the new calcium silicate cements proposed for endodontic application as root canal sealers associated with gutta-percha orthograde obturation techniques.

Methods. 105 adult patients who presented a mandibular molar to be treated endodontically, were separated in 3 groups, each group was composed of 35 patients (30 teeth presenting periapical lesion, 10 previous root canal treatments and 5 widened periodontal ligament). Endodontic single visit treatments were performed by the same operator. Working length was determined by the joint use of an electronic apex locator (PROPEX II-DENTSPLY MAILLEFER, Ballaigues, CH) and an intraoral radiograph. Cleaning and shaping was performed using the simultaneous technique with Mtwo NI-TI rotary files (Sweden & Martina SPA, Padova, IT) and Mtwo Apical NI-TI rotary files (Sweden & Martina SPA, Padova, IT) for the preparation of the apical area. Alternating irrigation of 5% NaOCl and 2.5% EDTA was used after each instrument. In cases of retreatment, Mtwo R 25/05 file (Sweden & Martina SPA, Padova, IT) was used in order to remove filling materials. Obturation of the root canal system of all teeth was carried out by the Domino system (Sweden & Martina SPA, Padova, IT). Different sealer cement was used for each group:

- Group I (Epiphany; Pentron Clinical Technologies, Wallingford-CT, USA) - Group II Top Seal (DENTSPLY MAILLEFER, Ballaigues, CH)
- Group III Tech BIOSEALER ENDO (Isasan srl, Rovello Porro, IT) Follow-ups were carried out 3 and 6 months after every treatment.

Results. were analysed using the software Statistical Package for Social Sciences (SPSS Inc, ver. 13.0, Chicago, IL, USA), chi-squared test was used for statistical evaluation of proportions. Treatment success was assessed by the healing of periapical tissues and no response to percussion.

Table 1. Results.

	Success rate
Group I	77.14% (27 teeth)
Group II	80% (28 teeth)
Group III	94% (33 teeth).

The difference between the first two groups and the third one is statistically significant ($p=0.03933$).

Conclusions. Tech BIOSEALER ENDO (Isasan srl, Rovello Porro, IT) exhibited promising results (in humid canals too) and a complete biocompatibility. It demonstrated that possesses all the advantages of calcium silicate cements such as excellent antibacterial properties; being at the same time more fluid and offering a suitable working time.

Comparison of different solutions for final rinse optimization, Hypoclean

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Aim. The purpose of this study was to assess the penetration of a new modified sodium hypochlorite solution labelled with 0.2% alizarin red into dentinal tubules when used in root canals with PUI activation.

Methods. 32 extracted human single-rooted teeth were selected for the study. Crowns were at 2 mm above the CEJ. 30.06 was the last file used at the WL. The teeth were randomly divided into four groups (N=8). A final rinse of each canal was performed with different agitation procedure: control, NaOCl+PUI, Hypoclean, Hypoclean+PUI. Specimen was cut at 1, 3, and 5 mm from the apex and were examined with a fluorescence light microscope at 100X. Images were evaluated following a set of scores used to assess the penetration of solution into the dentinal tubules. Statistical analysis was performed by using Kruskal-Wallis analysis.

Results. Differences were found among groups in relation to the irrigation regimen used. Groups were ranked in the following order: control<Hypoclean<NaOCl+PUI= Hypoclean+PUI Group. At 1 mm from the root apex, the Hypoclean+PUI group exhibited the highest score.

Discussion: In the present study Hypoclean was compared to 5.25% NaOCl. The two irrigant were tested without activation into root canal and in association with PUI. Hypoclean showed a better result when was used without activation, but no differences were found when was used in combination with PUI.

Comparison of smear layer removal ability using different protocols for the final rinse optimization

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Aim. This study aimed to compare the efficacy of Tetraclean and 17% EDTA as final irrigants in the removal of the smear layer in the coronal, middle and apical thirds of the instrumented root canal.

Methods. Forty extracted human permanent teeth (n =10) were randomly assigned to the following groups: (1) control group, the root canals were not submitted to any smear layer removal procedure, (2) EDTA group, (3) Liquid Tetraclean group (only liquid component of Tetraclean), (4) Tetraclean group, (powder + liquid). The specimens were submitted to scanning electron microscopy analysis. Magnifications of 500X and 1000X were used to evaluate cleaning at the apical, middle, and cervical thirds according to a three-point scoring system. Data were statistically analyzed using the Kruskal-Wallis analysis of variance test (5% significance level).

Results. When the entire canal was considered, groups were ranked in the following order: 1>2≥3=4 (p<0.05). For different sections of the canal space, distance from the apex (2, 6 and 10 mm) influenced smear layer removal within each group (p<0.05).

Conclusions. The use of a chelating agent leads to a higher removal of smear layer from the root canal walls. Differences between EDTA and Tetraclean were only evident at 6 mm from the apex, whereas at 2 mm both protocols had similar performances in smear layer removal from the root canal system of single-rooted permanent teeth.

Comparison of two techniques for assessing the shaping efficacy of repeatedly-used NiTi rotary

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Aim. The shaping capacity of NiTi rotary instruments is often assessed by photographic or micro-CT measurements, and these instruments are often used more than once clinically. This study was conducted to compare photographic and micro-computed tomography (micro-CT) measurements and to assess if repeated use of NiTi instruments affected the shape of canal preparation.

Methods. Ten new sets of ProTaper Universal instruments were used in 60 resin blocks simulating curved root canals. Groups 1 to 6 (n=10) represented 1st to 6th use of the instrument, respectively. Digitized images of the prepared blocks were taken in both mesiodistal (MD) and buccolingual (BL) directions and area measurements (mm²) were calculated using AutoCAD. The volumes of the same prepared canals were measured using micro-CT (mm³). Statistical analysis was performed to detect differences between photographic and volumetric measurements, and differences between uses.

Results. Two-way repeated measures ANOVA revealed significant differences between groups (p<0.001). Regarding measurement type, there were no significant differences between BL and MD measurements, but there were significant differences between micro-CT and BL (p<0.001) and micro-CT and MD (p=0.001). Significant differences were also noted between uses.

Conclusions. Within the limitations of the present study, micro-CT is more discriminative of the changes in canal space associated with repeated instrument use than photographic measurements. Canal preparations are significantly smaller after the third use of the same instrument.

Conservative-prosthetic recovery of endodontically treated tooth: a Literature Review

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Aim. Post is the most suitable type of restoration in order to obtain the morphological and structural recovery of endodontically treated tooth, especially in cases with considerable loss of dental substance of the coronal portion. Many studies have shown that the correct execution of a root canal treatment does not weaken the tooth and that the main factor that really affects the fracture strength of a dental element is the amount of remaining tooth structure. The abutment post ensures retention and stability of the post itself by restoring impaired coronal portion.

Methods. Target of this study is to make a literature review about evolution of posts in last years, by paying particular attention to fiberglass and carbon fiber posts, with analysis of parameters such as modulus of elasticity, tensile strength and breaking strength.

Results and conclusions. In recent years a particular scientific and commercial interest has been directed to prefabricated posts. This type of root canal retention has found widespread because of easiness and speed of use and because they are cheap; moreover they respect the observation of aesthetic principles of the modern conservative, which requires the use of materials with chemical and physical features as more compatible and similar with those of dental hard tissues.

Control of torque accuracy in some endodontic motors

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Aim. The aim of this study was to examine and compare the accuracy of torque limitation of different torque controlled motors and contra-angles used in endodontics.

Methods. The real torque was measured with Dynamic Torque Measurement of Endodontic Systems, Magtrol HD-100-8NA-4811, Sirona Dental System; this dynamic torque measurement system is connected through a special instrument to the contra-angle of the endodontic motor under evaluation. In this study six different endodontic motors were analyzed: ATR EndoPlus, SIROEndo_Pocket, VDW.SILVER, VDW.GOLD, ASEPTICO Endo It e MAILLEFER X-Smart. For each motor the real torque was measured to a specific speed and it was compared to the value on the motor display, which was the set value of the operator.

Results. ASEPTICO Endo It with +46% showed the highest upper deviation; also MAILLEFER X-Smart, ATR EndoPlus, VDW.GOLD and SIROEndo Pocket had a high deviation with 24%, +13%, +11% and +12% respectively; VDW.SILVER achieved the best results: the values of its torque settings were within the range +3%, -18% of deviation.

Conclusions. Lower values of torque produce an efficiency loss while upper values increase the fracture probability; by this study VDW.SILVER is the motor which showed the best results for lower and upper values to set torque.

Cyclic Fatigue Resistance of Four Nickel-Titanium Rotary Instruments: A Comparative Study

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Aim. Aim of the study was to investigate the cyclic fatigue resistance of four different nickel – titanium rotary (NTR) instruments produced by a new method or traditional grinding processes.

Methods. In the present study four different NTR instruments from different brands, of identical sizes (.06 taper and 0.25 tip diameter) were selected and evaluated: group 1. Twisted File (SybronEndo, Orange, CA, USA) produced by a new thermal treatment of nickel – titanium alloy; group 2. (Revo S SU, MicroMega, Besancon, France); group 3. Mtwo (Sweden-Martina, Padova, Italy) and group 4. (BioRaCe BR3, FKG, La Chaux de Fonds, Switzerland,) produced by traditional grinding processes. Twenty NTR file from each manufacturer were tested for cyclic fatigue resistance, resulting in a total of 80 instruments. Tests were performed by a cyclic fatigue device that evaluated cycles to failure of rotary instruments inside curved artificial canals with 60 degree angle of curvature and 5 mm radius of curvature. The instruments were rotated at a constant speed of 300 rpm. All instruments were rotated until fracture occurred. The time to fracture (TtF) from the start of the test until the moment of file breakage was recorded with a chronometer. The length of the fractured tip was also recorded for each instrument. Data were subjected to one-way analysis of variance (ANOVA).

Results. Group 1 (Twisted File) showed the highest value of TtF means. Cyclic fatigue resistance of Twisted File was significantly higher than group 2 (Revo S SU) and 4 (BioRace BR3) ($P < 0.05$), while no significant differences were founded between group 1 (Twisted File) vs 3 (Mtwo) or group 2 (Revo S SU) vs 4 (BioRaCe BR3) ($P > 0.05$).

Conclusions. Twisted File 25.06 had the best absolute TtF values. The cyclic fatigue resistance of Twisted File was significantly more than those produced with the traditional grinding process except of Mtwo files.

Effect of acidic environment on Mineral Trioxide Aggregate superficial and internal microhardness

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Aim. To evaluate the influence of acidic pH on Mineral Trioxide Aggregate (MTA) Vickers microhardness (VH) at different depths.

Methods. ProRoot MTA (Dentsply Tulsa Dental) was mixed with sterile water and compacted into cylindrical moulds having an internal diameter of 3 mm and height of 6 mm. Specimens were randomly assigned to group 1 (G1, n=10) or 2 (G2, n=10), immediately immersed into buffer solutions at pH values of 7.4 (G1) or 4 (G2) and therein stored for 24h. Thereafter, each specimen was cross-sectioned at a depth of 3mm. VH analysis was performed on the top, on the intermediate (3 mm) and on the bottom surfaces. Data underwent statistical analysis by means of repeated measures ANOVA, paired- and independent-samples t tests ($p < 0.05$).

Results. Lack of MTA integrity of top surfaces in G2 did not allow VH measurement. VH mean values \pm SD (VHN) were: G1 top 68.73 \pm 18.20, G1 intermediate 66.65 \pm 8.40, G1 bottom 62.36 \pm 6.23; G2 intermediate 56.41 \pm 4.29, G2 bottom 61.46 \pm 13.85. No significant differences were found within each group amongst measured surfaces. Similar VH values were found on bottom surfaces in G1 and G2, whilst significantly lower values were recorded in G2 when comparing intermediate surfaces.

Conclusions. A pH value of 4 affected the VH of MTA on the exposed top surface and at a depth of 3 mm. A similar behavior in clinical conditions can be hypothesized when MTA is used as root-end filling material; further studies are needed.

Endodontic surgery with guided tissue regeneration comparison with only flap closure. A Case Report

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Aim. Endodontic surgery has for aim to treat bone lesions due to root canal infections. the aim of the present study was to evaluate the periapical healing of apical defects 24 months after periradicular surgery and guided tissue regeneration in a series of consecutively treated patients.

Methods. 10 patients were treated with guided-tissue regeneration and 10 without biomaterial and membrane after surgery. Root-end cavities, 2.5 to 3 mm deep, were prepared with piezo-ultrasonic tips. Root-ends were sealed using Super EBA. the choice of using or not GTR associated with deproteinized bovine bone for each patient was made by a computer-generated randomized table. For cases allocated to the GTR group, the defect was filled with anorganic bovine-bone mineral and then covered with a resorbable collagen membrane. The outcome was assessed by clinical and radiographic evaluation at 24 months follow-up.

Results. All patients were recalled after 1, 3, 6, 12 and 24 months. At the one-year follow-up all teeth had successfully healed, healing was uncertain for 1 tooth after 24 months and 3 were classified as failure

Conclusions. GTR as a complement of periapical surgery is not necessary for four-wall defects. However, it may be an indication for transosseous lesions. Guided tissue regeneration treatment of apicomarginal defects yields good results in terms of periapical and periodontal healing and should be considered as an adjunct to periradicular surgery in such cases.

Evaluation of cyclic fatigue resistance of different Ni-Ti files

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Aim. The aim of this study was to compare the cyclic fracture resistance of rotating endodontic Ni-Ti instruments (Protaper F2, Flex Master and Reciproc) used in rotation and in reciprocating motion.

Methods. The cyclic fracture resistance of rotary Ni-Ti endodontic instruments was tested with a special device aiming at recreating the same conditions for all instruments. The instruments were rotated at constant speed and torque up to fracture, recording the time to fracture in seconds. 10 Flex Master 25/06, 10 Protaper F2, 10 Reciproc used in rotating motion and 10 Reciproc using in reciprocating mode were tested. A statistical analysis was applied to check differences between the groups.

Results. When comparing the resistance to cyclic fatigue, Reciproc had a mean of 263 seconds in continuous rotation and 318 seconds in reciprocating motion, Protaper F2 used in continuous rotation had a resistance of 53 seconds while the duration for Flexmaster 25.06 in continuous rotation was 61 seconds. Statistical differences were found among the groups.

Conclusions. The resistance to cyclic fatigue is significantly influenced by the type of movement (reciprocating better than rotating). Also the kind of alloy is important (Reciproc-m wire was always more resistant than standard ni-ti even in rotating motion).

Evaluation of interface root dentin-resilon using different adhesive systems

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Aim. The aim of our research was to compare at the microscopic level, the quality of accession to the root walls of Resilon / Real Seal (Sybron Endo), with a variable of the experiment the adhesive system used.

Methods. 60 premolars were collected, with root canal anatomy of oval-type extracts for orthodontic reasons and / or periodontal. The teeth were then divided into three groups: -The first group of 20 items was treated with the primer RealSeal introduced into the channel by a microbrush and pushed to the apex through a cone of paper. -The elements of group 2 were treated identically to those in group 1, but the root canal was first etched with 37% phosphoric acid (Etching gel, 3M ESPE), and finally were blocked as for group 1. -The elements of group 3 were treated with an adhesive system 2-step etch and rinse (XP-Bond, Dentsply). Among specimen treated have been selected randomly through 3 for each group, for observation under a stereomicroscope. The samples were dissected under a stereomicroscope at magnifications observed increasing (6X, 16X, 40X). During this observation, the interface was evaluated root dentin-filling in the various samples treated with various adhesive systems, in order to assess the presence of any gaps.

Results. For the statistical analysis used the Mann-Whitney U test with a significance level (P) of 0.05. The comparison between the different groups showed that: between group 1 and group 2, the p-level is 0.04953; between group 1 and group 3, the p-level is 0.04953; between group 2 and group 3, the p-level is 1. This shows that there is a statistically significant difference in comparison between the values of group 1 and group 2 and 3, while there are no statistically significant differences in comparison between groups 2 and 3.

Conclusions. The results disproved the null hypothesis showing that, by modifying the adhesive system, is best levels of membership intracanalari in connection with the filling Real / Seal (Sybron Endo).

Evaluation of the bond strength of circular and oval posts luted in oval shaped canals

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Aim. The aim of this laboratory study was to evaluate the post-root dentin push-out strength of circular and oval posts luted in oval shaped canals with two different resin cement.

Methods. Twenty monoradicular premolars with oval-shaped canals were selected, endodontically instrumented and obturated. The teeth were divided into two groups according to the drill – fiber post system used for the preparation of post-space (Ellipson oval tip+post and MTwoPF+DT light post). Each group was subdivided into two subgroups according to the cement used (Core and Gradia Corecem Automix). The bond strength was evaluated with thin-slice push-out test. The bonded area was calculated with an appropriate geometric formula in order to express the retentive strength of the post segment in MPa. The results were analyzed by Kruskal-Wallis ANOVA.

Results. The results revealed that neither the drill-post system nor the cement significantly affected the push-out bond strength.

Conclusions. In terms of bond strength, Ellipson system resulted as effective as a circular drill-post system. Nevertheless the use of the oval tip-oval system has some advantages. The thickness of the resin cement may be a critical factor for the clinical performance of the fiber posts: as an excessively thick layer of resin cement around a fiber post was correlated to higher frequencies of post debonding. The oval tip-post system could overcome this inconvenient.

In vitro evaluation of cyclic fatigue of rotary Ni-Ti instruments

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Aim. The aim of this study was to evaluate, in vitro cyclic fatigue of Ni-Ti rotary instruments through the use of an experimental model.

Methods. The Ni-Ti rotary instruments evaluated were 18 ProFile 25/.06 (Maillefer-Tulsa, USA), 18 K3 25/.06 (Sybron Endo, Orange), 18 Twisted File 25/.06 (Sybron Endo, Orange). The analysis of resistance to cyclic fatigue was performed using an experimental model with angles of 45 °, 60 ° and 90 °. Finally an endodontic handpiece VDW Gold Series (Dentsply, Italy) was fixed in a vise. The working parts of the instrument, equal to 16 mm, was inserted into the hollow cylinder with a length of 9 mm, measured using a caliper. In order to estimate the time of fracture was filmed using a Sony Full HD (1080) 10.2 megapixels. The statistical test was conducted using ANOVA and t-student to analyze two groups of instruments at the same angle. Null hypothesis (H0): The three different types of Ni-Ti have the same resistance to cyclic fatigue flexor. Alternative hypothesis (Ha): At least one of the three instruments is resistant to cyclic fatigue flexor than that of others. The significance of both tests has been put at 5% ($p \leq 0.05$).

Results. Twisted File and ProFile to 45 ° and 60 ° showed a highly significant resistance to cyclic fatigue ($p < 0.0001$) compared to the systematic K3. Between ProFile and K3 no statistically significant difference was showed by 90° ($P > 0.05$), but the systematic Twisted File was statistically significant compared to the other two ($p < 0.0001$).

Conclusions. The statistical analysis showed a good resistance to cyclic fatigue with regard to systematic ProFile and Twisted File, by contrast, the systematic K3 was found to be less than 45 °, 60 ° and 90 °.

In vitro evaluation of the apical seal through microinfiltration and diaphanization of the canal obturation system guttaflow fast

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Aim. This in vitro study compared the apical seal of teeth treated by GuttaFlow Fast with teeth treated by Thermafil and SystemB.

Methods. Sixty extracted human monoradicular teeth were numbered and divided in 3 groups of 20 teeth each. After the obturation, the teeth were observed with the RVG digital system and using the microscope through microinfiltration and diaphanization of each sample. The results were compared statistically using the Chi-squared test.

Results. By the radiographic analysis it has been possible to evaluate the correct shape, the presence of empty spaces and the apical seal. With the microscopic analysis the parameters evaluated were the micro-infiltration of the apex, the exact working length, the presence/absence of empty spaces or cement to the apical level and the filling of auxiliary canals.

Conclusions. The absence of statistic significance shows that GuttaFlow Fast can be used as a valid therapeutic alternative respect Thermafil and SystemB.

Microarray analysis of genes codifying for G proteins in healthy and inflamed pulp tissue

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Aim. The aim of this study was to analyze the gene expression of G proteins, in particular of GPR35 and GPR119, through Microarray technique in healthy and inflamed pulp tissue.

Methods. Healthy dental pulp samples were obtained from impacted human third molars extracted for orthodontic reasons, while inflamed dental samples were obtained from teeth with pulpitis, following informed consent. The experimental procedures were the same for both kind of sample. Pulp tissue was placed into RNA later immediately after removal. Total RNA was isolated using SV Total RNA Isolation System. Results were analyzed by clusters, in order to individuate series of relatively homogeneous genes. Data were analysed by SAM and Ingenuity Pathway Analysis (IPA) software was used for network analyses. In order to confirm Microarray results, the same genes were analysed by RT-PCR.

Results. Through IPA software, genes were categorized based on location, cellular components, and reported or suggested biochemical, biologic, and molecular functions. The identified genes were also mapped to genetic networks available in the Ingenuity database and then ranked by score. Several genes, involved in development and cellular proliferation were shortlisted from the compared analysis. Our results highlighted the overexpression of genes involved in pulp inflammation, as IL-1, IL-24, MMP9, TNF, and CD40. Both from Microarray and RT-PCR analyses, genes belonging to the G protein family, in particular GPR35 and GPR119, resulted highly expressed in inflamed dental pulp.

Conclusions. The overexpression of GPR35, responsible of nociceptive stimulation in inflammatory processes, in inflamed pulp suggest its implication in referred pain of patients with acute pulpitis. GPR119 gene, regulator of insulin secretion in pancreatic cells and related to Type II diabetes, is also highly expressed in inflamed pulp. These results could suggest a direct relationship between its expression and glycemic decompensation, which has been already found in patients with oral infection.

Ni-Ti rotary instruments surface alterations caused by heat sterilization

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Aim Defects on of nickel-titanium endodontic file surface can play a role in instrument fracture. Aim of our study was to evaluate by using scanning electrical microscopy (SEM) and Energy dispersive x-ray spectroscopy (EDS), the effect of repeated dry heat sterilization on surface characteristics of NiTi rotary instruments.

Methods. ProTaper (Dentsply Maillefer, Ballaigues, Switzerland) and AlphaKite (Komet, Italy) files were tested. The instruments were exposed to 1, 5 and 10 cycles of sterilization. Each groups included four Protaper (S1, S2, F1, F2) and four AlphaKite (15, 20, 30, 40). After sterilization the samples were observed by a low-vacuum scanning electron microscope SEM (FEI, Nedherland), and surface analysis was performed on each instrument with energy dispersive spectroscopy (EDS).

Result SEM observations showed the presence of debris, pitting and deep milling marks in both new and sterilized files. After 5 and 10 sterilization cycles, surface roughness increased significantly ($p<0.05$) for ProTaper, while AlphaKite (TiN-coated) instruments showed no significant differences compared to the controls ($p<0.05$). EDS analysis showed that ProTaper instruments were composed mainly of Nickel 54.15 %, Titanium 43.66 % and Aluminum 2.19 %. In addition to Titanium (46.24%) and Nickel (30.38%), AlphaKite showed the presence of Nitrogen (21.08%). These percentages changed after dry heat sterilization, with alterations of coating surface.

Conclusions. Our results indicate that dry heat sterilization might modify the surface morphology and chemical composition of NiTi instruments and that TiN coating can reduce these phenomena.

Oxidative Stress and Chronic Apical Periodontitis: an Assessment of the Levels of Oxidative Stress Before and After Endodontic Treatment in 103 Patients with Chronic Apical Periodontitis

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Aim. The aim of the present study is to assess the correlation between chronic apical periodontitis and oxidative stress. In fact, chronic apical periodontitis is reactive oral disease and it may cause an imbalance between production and elimination of Reactive Chemical Species (RCS), with a greater risk for onset of parapsychological and pathological conditions, such as cardiovascular diseases.

Methods. A randomized group of 103 patients between 30 and 68 years of age, presenting with chronic apical periodontitis, was recruited. We assessed the oxidative balance by measuring the oxidant status by d-ROMs Test and the antioxidant status by BAP Test, before endodontic treatment and 30 and 60 days after. Patients were excluded from this study if there was no healing of chronic periodontitis.

Results. On recruitment, patients affected by chronic apical periodontitis presented with higher d-ROMs Test values than the average values of healthy subjects. These values decreased by $28 \pm 9\%$ 30 days after endodontic treatment and by $35 \pm 10\%$ at 60 days.

Conclusions. We observed a positive association between oxidative stress and chronic apical periodontitis. We can conclude that the presence of chronic apical periodontitis increases the risk of diseases related to an altered oxidative balance, due to the higher levels of oxidative stress. The present study also revealed that after treatment of chronic apical periodontitis, the levels of oxidative stress tend to reduce and return to normal after 60 days. The treatment of these lesions of endodontic origin brings the levels of oxidative stress back to normal, and reduces the risk for onset of diseases related to a condition of oxidative stress.

Periapical lesions: when the only endodontic retreatment can be decisive

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Aim. the principal aim of this article is to show how endodontic retreatment could be decisive to resolve many periapical lesions without resort to endodontic surgery or exodontics.

Methods. one female patient showed by a diagnostic OPT a periapical lesions corresponding to an element previously endodontically treated. As therapeutical approach, we choosed to procede with an orthograde retreatment, in order to obtain bactericidal effects, better detersion of root canal and apical seal. Radiographic controls were done at 3, 6 and 12 months.

Results. the radiographic images analysis showd a gradual resorption of periapical lesions up to complete healing.

Conclusions. this case demonstrate how traditional endodontic approache may be sufficient to resolve this kind of problems, without using surgery methods.

Scanning electron micrograph and Energy Dispersive Analysis of two Mineral Trioxide Aggregate: White ProRoot versus Aureoseal

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Aim. This study compared the chemical constitution and surface microstructural morphology of two Portland-like cements: Mineral Trioxide Aggregate vs Aureoseal.

Methods. WMTA and Aureoseal were mixed according to manufacturer's instruction and packed into 32 cylindrical stainless steel molds. All the samples were stored at 7.4 pH for 7 days. Microstructural surface morphology were evaluated under scanning electron microscope by using scattered electron (SE). The chemical constitution of the two cements was determined by Energy Dispersive X-ray spectroscopy (EDX).

Results. The SE detector revealed crystal formations on the WMTA surface; no reveal crystal formations on the Aureoseal specimens. The chemical composition of MTA and Aureoseal was quite similar (calcium, oxygen and silicon) except for radiopacifier, bismuth oxide in MTA, tungsten in Aureoseal, and for transitions elements only present in Aureoseal.

Conclusions. There was significant differences in term of physical and chemical characteristics between WMTA and Aureoseal.

Single visit procedure for root canal treatment and bleaching of a discolored tooth: a case report

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Aim. Root canal treatment and bleaching of a discolored tooth is one of the most commonly used procedures in contemporary endodontics and restorative dentistry. A case of a discolored tooth in a maxillary left incisor in an 38 year old woman patient is reported.

Methods. The patient came to our attention claiming the presence of a discolored tooth, requiring the immediate possibility of bleaching. Radiograph examination showed an incorrect endodontic treatment and the presence of a separated fragment of an endodontic instrument. The tooth was retreated and the fragment was removed with the use of ultrasonic instruments, the root canal was then shaped and irrigated copiously with 5% NaOCl and EDTA 17%, then a canal obturation was performed with warm gutta-percha. A power bleaching gel 38% Hydrogen peroxide was then used with a chemical activation for 30 minutes, and the tooth was immediately restored with a fiber post.

Results. The clinical and radiographic examination at 4-6-12 -24 months showed a good root filling and a good margin seal of the restoration, and the color of the restoration was well integrated with the rest of the tooth.

Conclusions. Endodontic retreatment, immediate bleaching, and fiber post cementation might be a viable alternative to conventional treatments.

Treatment of necrotic teeth with open apices: long term follow-ups.

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Aim. In case of necrotic teeth with incomplete root development the absence of apical constriction obstacle the three-dimensional sealing of the root canal system. This study reported the long term success rate of 10 cases of necrotic teeth with open apices treated with Mineral Trioxide Aggregate apical plug technique.

Methods. 10 teeth with necrotic pulp, chronic periodontitis and incomplete root development were selected for this study. The same operative protocol was adopted in all cases, MTA was used as apical plug; the therapy was completed in three appointments. One, two, five and eight years radiographic and clinical follow-ups were performed.

Results. at eight years only one case showed a failure of the therapy, the remaining nine cases showed a clinical and radiographical healing.

Conclusions. the introduction of Mineral Trioxide Aggregate (MTA) as apical plug consent to setting up of a predictable and quick technique.

Vital pulp therapy in permanent teeth: a review

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Aim. This study reviewed the concept of maintaining of pulp vitality in immature permanent teeth; as well as presenting three cases reports by using Mineral Trioxide Aggregate in vital pulp procedure.

Methods. Based on published articles to date, the role of bioactive materials, Mineral trioxide Aggregate in treatment of immature permanent teeth with irreversible pulpitis, is summarised in the review. The operative protocol of vital pulp therapy with MTA in three permanent inferior molar was illustrated step by step. The recall period ranged from 6 – 48 months. Moreover alternative biologically based treatments, which promote apexogenesis, have been described in the literature.

Results. The literature reported an increased interest in applying the concept of tissue for the management of immature teeth with compromised pulp. The teeth treated with MTA showed continued root formation and respond within normal limits to pulp tests.

Conclusions. Clinically the main difficulty in treating permanent immature teeth is the ability to predictably diagnose the state of pulpal health. The current data available on the use of MTA in vital pulp therapy indicates that it is the proper material to use.

GNATOLOGY

Analysis of occlusal forces in TMD with T-SCAN III

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The temporomandibular disorders consists of various pathologies of the TMJ, masticatory muscles and structures associated with them. They involve, in addition stomatognathic apparatus, more functional systems belonging to the axis cranio-cervical-mandibular. Over the years, scientific research of the etiopathogenetic factors of the temporomandibular disease, focused periodically occlusion that appears to be one of most controversial and debated factor. Great interest has been showed to the analysis of occlusal contacts. Several Authors have agreed that an altered occlusal conditions the course of a dysfunctional pathology. The clinical methods designed to detect occlusal contacts are different, and are based on the work of health. The aim of our study, was to analyze the distribution of occlusal forces in a group of dysfunctional patients in maximum intercuspal, evaluated for single dental element, by sector and by hand. The data collected in the TMD patients, are compared with those observed in a control group of not dysfunctional. Use of T-Scan can evaluate the distribution of forces on individual teeth or on specific areas to be investigated. The most significant results that can be seen from this work is that which indicates an increase of occlusal forces on the anterior area in the dysfunctional group than the control group. The T-Scan schows can be a valuable tool in the diagnosis and treatment phase of the dysfunctional patients. However, the field is still open for further study, particularly as regards the study of the distribution of forces in the different disease patterns.

Analysis of the occlusal force during masticatory function: a new method

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Measuring intra-oral force has always been subject of interest. Throughout the centuries, several methods were developed to determine occlusal force, using devices strictly depending on the physical and technological knowledge of the period during which they were conceived. Ideally, measuring methods should not alter quantitatively what has to be measured. The aim of our work is the realization and the set up of a new method to measure occlusal force both statically and dynamically. A sample of twenty subjects (average age 24,15 years) was recruited. Flexiforce piezoelectric sensors were chosen to measure occlusal force, and they were mounted on thermoplastic resin templates, which were created individually for each subject. Sensors are positioned in the templates'slots, specifically created in correspondence of the first mandibular molars. Each subject is asked to perform three tasks: maximum voluntary force for at least three seconds; clenching; maximum unilateral voluntary contraction, both right and left, for at least three seconds, with a roll of cotton. All the tasks were repeated three times. Simulation of a masticatory cycle with a synthetic bolus was also performed. Every subject was invited to repeat the registration of the entire test seven days after the first execution. The calculation program MATLAB, permitted to implement a program which allowed us the comparison and the data analysis through graphic visualization and number ratings. The new method showed itself as very reliable and highly repeatable and allows a good analysis of the force peaks during masticatory cycle.

Correlation between posterior crossbite, temporomandibular disorders and headache: review of literature and sperimental study

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Aim. The purpose of this prospective study was to evaluate the correlations between the presence of unilateral posterior crossbite and TMJ disorders, masticatory muscles asymmetries and incidence of headache.

Methods. The study group included 15 patients with functional unilateral posterior crossbite involving three or more posterior teeth and the control group comprised 15 individuals with normal occlusion. Both groups were investigated by a careful medical history, clinical evaluation of signs and symptoms referred to TMJ and with the analysis of electromyographic and kinesiographic data about mandible movements and masticatory muscles activity.

Results and conclusions. In crossbite group the main relevant data are: ipertone of mm Temporalis (Scan 9) in mandible rest position (42%); discinesia during mandible movement (57% at Scan 3); muscular strength deficit during mastication; elevated incidence of Tension-type Headache (73%); condile-disc incoordination (72%); orofacial pain (82%). This study underlined that posterior crossbite could be considered as an eziologic factor for cranio-mandibular disorders. The statistic evaluation of the results suggests the possibility of a complex correlation between posterior crossbite, tension-type headache and temporomandibular disorders. Key Words: Unilateral Posterior Crossbite; TMD; Headache.

Craniomandibular dysfunctions and posture: a case report

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Aim. Craniomandibular disorders and poor posture are rather frequent in the general population and require a critical diagnostic and therapeutic phase, in which an important role is played by the dental surgeon expert in gnathology. The aim of the present work is to show the importance of a thorough occlusal, gnathologic and postural examination in a partially toothless patient, in order to perform a prosthetic rehabilitation respecting the articular and neuromuscular components.

Methods. The clinical case is a 30-year-old female patient with occlusal disharmony, muscular overtonic, painful limitations of opening and closing movement, articular click and consequent disharmonic postures. A thorough clinical examination of the TMJ was performed, along with intraoral registration with the Gothic arch tracing method and kinesiography. Finally, cotton rolls were placed between the teeth and then another postural examination was performed with a plumb line.

Results. The patient, during the examination with cotton rolls placed between the teeth, both walking and plumb-line, showed a good posture re-establishment, directing our analysis towards a clinical picture of descending postural dysfunction syndrome and, therefore, towards the need of a repositioning appliance. **DISCUSSION:** A thorough evaluation of muscular system, TMJ and posture is fundamental to identify a descending postural dysfunction syndrome and to make a differential diagnosis with the ascending and mixed forms on a psychical base.

Conclusions. Before proceeding with complex prosthetic or implant-prosthetic rehabilitations in patients with postural and cranio-mandibular disorders, it is imperative to restore the stomatognathic balance, allowing for prosthetic manufactures in keeping with the postural system of the individual. A failed resolution of the dysfunctional picture will contribute to worsen the set of symptoms with subsequent failures.

Dental occlusion and sporting performance: is there scientific evidence?

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Aim. The aim of this review of the literature was to assess the scientific evidence for detectable correlations between dental occlusion and sporting performance.

Methods. A literature examination was carried out on Pubmed bibliographic database, covering the period from May 1965 to February 2011, using the following keywords: dental occlusion, sport, performance.

Results. A selection was performed, so studies without statistical analyses, instrumental exams and control group studies on animals or with excessively low quality were excluded from the review and 7 articles out of 414 were selected for the final analysis.

Conclusions. 1) Owing to the low number of the studies and their low quality level a greater application in the sport dentistry field is required. 2) Scientific and technological progress allowed to perform experimental exams of better trustworthiness which can simulate a real sporting performance instead of a pure muscular effort. 3) It seems to exist a correlation between dental occlusion and sport, not only owing to an effect on muscular strength but probably also for the intervention of other factors influenced by dental occlusion (ex. postural control). 4) The existence of a correlation between dental occlusion and sport can't be confirmed because of the contrasting results, the low number and the limited quality level of the scientific studies executed until now.

Diagnostic 3D imaging of masticatory muscles

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Aim. The aim of the present study is to show the diagnostic possibilities of Dolphin 3D software in the analysis of muscular structures.

Methods. Images 3D TAC Cone beam were elaborated by Dolphin 3D software to evidence insertion, volume and area of temporalis and masseter muscles in healthy patients.

Results. The software is able to evidence physiological characteristic of the muscles, so it's possible to evidence eventually pathological alterations of the structures.

Conclusions. Dolphin 3D software could be a valid instrument for the diagnosis of muscular pathologies like inflammatory states, hyper or hypo trophy in TMD' patients.

Evaluation and gnathological treatment in a patient with a Chiari Syndrome I: case report

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The Arnold-Chiari syndrome is a whole of signs and symptoms caused by a rare malformation of the posterior cranial fossa, which is reduced in dimension and this results in a caudal descent of the brain system, through the foramen magnum. In the Chiari malformation I these structures are represented by the cerebellar tonsillae. In the Chiari malformation II also the vermis, the lower portion of the cerebellum and the bulb are dislocated. The Chiari malformation III is a true encephalocele and malformation IV is the lack of development of the brain structures. We observed a subject with diagnosis of Chiari syndrome I, male, 16 years old. He suffered from 8 years by frontal and occipital cephalgia, retro orbital pain, balance alterations, sense of pressure in the ears, tinnitus, hypoacusia, tmj pain and noise. Specialist exams were already performed, like brain and spine magnetic resonance imaging, brain phase-contrast tomography and oculist examination in Pediatric Neuropsychiatry Centre. The frequency and intensity of symptoms got worse during the years. Although the medical therapies carried out had no success, the beginning of conservative gnathologic treatment resulted in few months in a clear and stable improvement of patient's symptoms and quality of life. This suggests that we need to evaluate more cases to establish the real contribution of gnathologic treatment in the symptoms management of these patients.

Evaluation of the role of mandibular position and ocular afference in relation to the postural system of military and civilian pilots

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Aim. In collaboration with the Italian Air Force, we decided to outline this research protocol in order to evaluate the postural structure of military and civilian pilots and how certain factors such as mandibular position, ocular afference or the category of pilot (military or civilian) could possibly influence it.

Methods. For the protocol, 20 military pilots (average age 35.15 years old; D.S.12,72) and 20 civilian pilots (average age 34.23; D.S.13,64) were selected. Postural-Stabilometric Tests on a force platform (DI Medica Italy) and Equi Tests were carried out on the military and civilian pilots. The area of the movements, the length of the tract and the speed of each stabilometric test on the platform were measured, while for the Equi Test the numerical value was evaluated. In order to evaluate the effective influence of each factor on the response from a statistical point of view, in light of the multifactorial nature of the matter, we decided to use an ANOVA (Analysis of Variance), considering the results of the stabilometric tests as the response variables, taken one at a time, and using the "category" (military and civilian pilots), "eyes" (eyes opened and closed) and "mandibular position" (rest position, centric position with cotton rolls) factors as models. Our aim is thus to evaluate the influence of the various factors (in particular pilot category, mandibular position and ocular afference) on the responses.

Results and conclusions. The postural structure of the military and civilian pilots does not display substantial differences. Ocular afference (P-value<0.05) alters the posture of both the military and civilian pilots in a statistically significant. The mandibular position seems to influence the postural structure but there are no substantial differences between the military and civilian pilots unless in maximum intercuspation position (where the military pilots tend to have higher values for the area analysed on the platform with eyes closed compared to the civilians).

Gnathological postural analysis and treatment used on military aeronautics pilots: a pilot study

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Aim. Aeronautics military pilots, due to the stress which they are subject to, are more likely to experience oral parafunctions such as bruxism than the normal population. Furthermore, they subject their craniocervical mandibular system to particular stress during their duties. The purpose of this project is to analyse a military pilot who is undergoing gnathological postural treatment in order to achieve better occlusal balance to prevent abrasion of teeth and if possible increase performance.

Methods. A military aeronautics pilot was chosen as a clinical case from among the many treated at the Milan "A. Mosso" Legal Medicine Institute. As according to protocol, clinical analysis of the stomatognathic apparatus and the postural system and an instrumental analysis (computerised occlusion analysis, Postural Stabilometric Test, Dynamic Posturographic Test) were carried out.

Results. The Equi-Test and Postural evaluations on Force platform (Correkta DI Medica, Italy) with splint inserted in the oral cavity showed the subject's postural and vestibular performance to be very high. Discussion and

Conclusions. The clinical-instrumental and gnathological postural treatment used on Italian military aeronautics pilots first of all allowed the pilot to protect the masticatory system from dental abrasion and, in this particular case, seemed to improve the postural structure analysed via the Dynamic Posturographic Test (Equitest).

Gnatologia Condilare

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Condylar gnathology was first idealized in 1885 by its founder W.Bonwill's when he established that the condyles, which are to be considered the center of rotation of the mandible, coincide to the articulator hinges. It is well known that the center of rotation of a curve lies strictly on the perpendicular to the curve at each of every individual point constituting the curve. Therefore, if we use an electronic methodology (which records by means of a tracing the dynamics of the opening and closure of the mandible), we see that in no point of the tracing there is a perpendicular passing through the condyle of the mandible observed. Under these circumstances the condyle cannot act as the center of rotation as initially thought by Bonwill : as a result the theory of condylar gnathology is to be considered false since based on an incorrect assumption.

Malocclusion and Helkimo Index: correlation with body posture

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Aim. Whether there are correlations between the stomatognathic system and body posture remains controversial. The aim of this study was to investigate whether malocclusal traits and Helkimo Index show detectable correlations with body posture alterations in children and young adults.

Methods. A total of 1,178 11-to-19-year-old subjects were divided into four groups: 1) controls; 2) malocclusion; 3) Helkimo index ≥ 4 ; 4) malocclusion + Helkimo Index ≥ 5 . Dental occlusion assessment included: overbite, overjet, posterior crossbite, scissorbite, mandibular crowding and dental class. Body posture assessments were performed by static analyses of body inclination and trunk asymmetry and according to the dynamic Fukuda stepping test. Univariate and multivariate statistical analyses were performed.

Results. Although at the univariate level both the trunk asymmetry and Fukuda stepping test showed significant differences among the groups, the multivariate level revealed that age and gender were mostly responsible. The only significant correlation seen was for the malocclusion + Helkimo Index ≥ 5 group: these subjects had a positive (worse) trunk asymmetry and a negative (better) Fukuda stepping test performance. With further multivariate analyses of each single malocclusal trait/Helkimo Index ≥ 5 (irrespective of the groups), only an increased overbite showed a statistically significant association with a slightly better Fukuda stepping test performance.

Conclusions. Given the small number of significant associations, the present study does not support the existence of clinically relevant correlations for malocclusal traits and Helkimo Index ≥ 5 with body posture in children and young adults.

Management of A case of hemifacial microsomia

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Aim. Describing a clinical case of hemifacial microsomia reported to Section of Posturology and gnathology of the dental clinic of A.O. San Gerardo, Milano Bicocca University in Monza, Italy, with the complaint of pain in the left TMJ clenching teeth or chewing food.

Clinical presentation. Extraoral examination revealed facial asymmetry with deflection of the vertical median line, deflection of the chin to the right, the left orbit lower than the collateral one and TMJ movements were reduced to a maximum mouth opening of 2 fingers. Orthopantomograph (OPG) showed hypoplasia on the right side of the ramus, body of the mandible, condyle and the coronoid process. All confirmed by Nuclear Magnetic Resonance (NMR). The patient was then classified using the widely accepted OMENS classification (orbit, mandible, ear, cranial nerves, soft tissues). A posturographic clinical and computerized (force plate) examination, showed a body torsion and load distribution on the right side. An occlusal bite was built and it was asked the patient to make some passive exercises. Four months after the occlusal bite balance the patient reported a reduction of symptomatology notwithstanding his mouth opening is still limited to 2 fingers.

Discussion and results. Hemifacial microsomia is a congenital hypoplasia of a side of the head and face with a wide variation in clinical presentation.

Multidisciplinary aspects of the diagnostic-therapeutic process in the OSAS of adults: flowcharts and selection and exclusion criteria gained by odontostomatological competence

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Aim. OSAS is a respiratory disorder characterised by repeated episodes of partial or complete obstruction of the upper airway at night with sleepiness, changes in daytime performances and snoring. Given the pathology's growing incidence and its serious consequences, the problem of OSAS is a matter of current topical interest. This study aims to formulate an adequate diagnostic-therapeutic procedure which highlights the role of dentistry within the specialist team in the pathology treatment. It underlines the necessity of fixing criteria of selection and exclusion of dentistry competencies in the therapeutic decision process.

Methods. The study has been carried out thanks to a revision of the literature from 1984 to 2010 found in Pubmed website and thanks to the participation to conferences and to the "I Congresso Nazionale di Odontoiatria nella Medicina del Sonno". These sources have been used: the diagnostic procedures of Associazione Italiana Pneumologi Ospedalieri and Associazione Italiana Medicina del Sonno; cephalometrics tests; the main principles of the American Academy of Sleep Medicine.

Results. Starting from the patients' individual characteristics this project has elaborated flowcharts with "categories" of patients according to their specific therapies.

Conclusions. The study has highlighted the importance of dentistry in the process of information, diagnosis and therapy and the necessity of rationalizing the diagnostic and therapeutic methods.

Occlusion and postural stabilization in patients with previous whiplash. Part 1: patients with normal occlusion

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Aim. Analyze the effects of dental occlusion on postural stability in patients with whiplash. First part: patients with normal occlusion.

Methods. 36 adult patients with previous whiplash and normal occlusion (good alignment, 1st class or mild 2nd class deep bite for mandibular retrusion). Exclusion criteria: use of psych drugs. Postural Romberg analysis (feet together, closed eyes) on stabilometric platform was performed under the following conditions: 1) in rest position, 2) centric occlusion, 3) clenching, 4) with occlusal disengage (cotton rolls), 5) clenching on cotton rolls. Time of each test: 15 seconds. It was performed a statistical analysis with T-test.

Results. stabilometry data (postural ball and ellipse) show better postural performances in centric occlusion and clenching, and a worsening with occlusal disengage (with statistically significant difference - $p < 0.05$).

Conclusions. postural instability caused by previous whiplash increases muscle tone and clenching as compensations. In these cases to put between dental arches a disengage (like an occlusal splint) induces a posture worsening (especially during sleep) in patients with normal occlusion. That suggests that in addition to the traditional functions of the stomatognathic system, there is another function of dental occlusion: the postural stabilization. In fact, clenching is a compensative phenomenon of an altered postural behavior.

Occlusion and postural stabilization in patients with previous whiplash. Part 2: patients with malocclusion

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Aim. Analyze the effects of dental occlusion on postural stability in patients with whiplash. Second part: patients with malocclusion.

Methods. 30 adult patients with previous whiplash and occlusal alterations (crossbite, mandibular shift, bad alignment, edentulous spaces). Exclusion criteria: use of psych drugs. Postural Romberg analysis (feet together, closed eyes) on stabilometric platform was performed under the following conditions: 1) in rest position, 2) centric occlusion, 3) clenching, 4) with occlusal disengage (cotton rolls), 5) clenching on cotton rolls. Time of each test: 15 seconds. It was performed a statistical analysis with T-test.

Results. Stabilometry data show better postural performances in condition with occlusale disengage (in centric and in clenching), and a worsening in centric occlusion ((with statistically significant difference - $p < 0.05$).

Conclusions. Postural instability caused by whiplash increases muscle tone and clenching, inducing a worsening of TMJ health in subjects with malocclusion. In these cases to put between dental arches a disengage, like an occlusal splint, induces better postural performances (especially during sleep). In patients with malocclusion, the stomatognathic system becomes a sources of postural disfunction or, in case of whiplash, a cause of postural worsening.

Registration of mandibular movement with optoelectronic systems

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Aim. The analysis of mandibular movement gives us information on the health and balance of joint. This study aim to present the 3D Tele Motion Tracking, an optoelectronic three-dimensional motion analyser, and the development of a custom protocol, for the registration of mandibular movements in three spatial planes.

Methods. This study was conducted on three males and seven females aged between 15 and 47 years in permanent dentition. Five of these patients came to our attention to solve a problem at the ATM. The other five patients had a clinical history without any symptom or ATM disorder. Each patient was performed an examination of mandibular movements with 3D Motion Tracking Tele.

Results. Using the 3D-TMT we were able to detect and analyze mandibular movements made during the different analysis (maximum opening, protrusion and lateral) of the Protocol. Our results show that the 3D-TMT is a reliable and easy to use, that can effectively objectify the stomatognathic function quickly and unobtrusively, showing graphically dynamic jaw, and taking account of changes in postural kinesiograph examination.

Conclusions. Overall this instrument used in conjunction with other diagnostic tests, provides a complete picture of arthro-myo-disc health in both single components and in its totality. Then is required its use in the diagnostic phase of orthodontic treatment, both in patients with temporomandibular disorders, to detect the type of etiopathogenesis, both in patients not dysfunctional, to carry out a full health screening of the ATM.

Resolution of a case of post-traumatic knee pain using an Orthotic

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This case would like to highlight, once more, the possible correlation between occlusion and posture. The orthodontic visit consists of a global analysis of the patient, as we usually do in our department, according to the protocol. This visit includes an orthodontic, gnathologic and postural examination This clinical case shows: a) a right joint click in the mouth opening movements b) progressive teeth misalignment with a clear change of the smile line c) right mandibular deviation d) unilateral right chewing Furthermore the history shows a persistent pain on the right knee, following a skis fall (December 2009) which is accentuated during the flexion and the extension. The MRI (magnetic resonance imaging) of the knee shows: a) rupture of the posterior horn of medial meniscus b) rupture of the lateral meniscus We proceed to the construction and application on the mandible of the Orthotic in order to restore the occlusal function and the further orthodontic reevaluation. This leads to the disappearance of symptoms on the "ATM" and the recovery of lateral movements and protrusive. Such therapy, as well as determine the improvement of the under occlusal, also determines the complete and immediate resolution of the algic symptoms in the knee. The MRI of the knee confirm the new clinical, highlighting the healing of meniscal tissue and therefore the restitutio ad integrum of a case predicted as a surgical one.

Tecnical aspects and functioning principles of Tecar® system

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Aim. We explain the principles of the Tecar®, treatment of musculoskeletal disorders and certain TMD.

Methods. The frequencies of the Tecar® system reach deep into the tissues that- as semiconductor- offer resistance to the passage of electrical energy being converted into temperature. The therapeutic effect depends on the endothermic effect and rising potential energy of cell membranes. The Tecar® works in 2 modes of charge transfer (capacitive and resistive), with 2 types of electrodes, resulting in two types of flows.

Results. The flow of charges increases circulation, local temperature and vasodilation, thus increasing the drainage of the inflamed site and perfusion and increased influx of cells for the healing process.

Conclusions. Tecartherapy boasts innovative features: supply of endogenous biocompatible energy, specificity of action for specific tissue; therapeutic effect on tissues also unresponsive.

Temporomandibular joint involvement in juvenile idiopathic arthritis. Clinical diagnosis and MRI

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Aim. Juvenile idiopathic arthritis (JIA) is a term used to indicate a disease of childhood onset characterized primarily by arthritis starting before 16th birthday. The gold standard in early diagnosis of temporomandibular involvement in JIA is the Magnetic Resonance Imaging (MRI), but it can't be used as screening exam. Only clinical parameters can be used as screening exam. The purpose of this study is the analysis of the clinical parameters in literature, their evaluation in a group of patient (n=25) and the comparison with MRI.

Methods. 25 patients of the Pediatric Rheumatology Department of Padua's Hospital were referred for orthodontic and gnathologic evaluation. In 21 patients was available a MRI evaluation.

Results. All the patients had almost one clinical symptom. Decreased mouth opening (less than 40mm) and pain occur in the early stage of disease and the most common are laterodeviation, click/crepitation and decreased mouth opening.

Conclusions. All the parameters analyzed are good for detecting pathology, every child affected by JIA would get an odontostomatologic examination in order to reveal as soon as possible temporomandibular involvement.

The use of home therapy with TENS in case of myofascial facial pain: a six months follow up

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Aim. The aim of this study is to evaluate the effectiveness of daily home TENS in patients affected by myofascial facial pain (MP) and to evaluate the influence of comorbidity of generalized anxiety disorder and depression on therapeutic effectiveness.

Methods. 40 women with MP were examined: 16 (N group) without and 24 (DU group) with association of Generalized Anxiety Disorder (GAD) and/or Depression (DEP). Each patient had to do a cycle of 14 sessions of TENS: 1 session at the department, 13 home sessions and then suspension. We established three experimental timeline: T0 (first examination), T1 (follow-up after 1 month), T2 (follow-up after 6 months). At each timeline we collected the following data: the Visual Analogue Scale (VAS) maximum, average, on examination, the Pericranial Muscle Tenderness Score (PTS), the Cervical Muscle Tenderness Score (CTS) and the Range Of Motion (ROM).

Results. After a cycle of daily home TENS we observe for the N group a decrease of the VAS, the PTS and the CTS and an increase of the ROM. For the DU group we observe a decrease of the VAS, the PTS and the CTS, an increase of the ROM from T0 to T1 and a relapse after 6 months.

Conclusions. The use of daily home TENS is a useful therapy to treat the myofascial facial pain. When we treat a patient we always have to consider the comorbidity of GAD and DEP and to treat it to avoid a relapse after the therapy.

Therapeutic protocols with Tecar® System in the treatment of temporomandibular disorders

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Aim. We report a preliminary study using 14 patients undergoing Tecar therapy in gnathologic and physiotherapeutic treatment.

Methods. We test the effectiveness of resistive and capacitive energy transfer, induced by the application of equipment Tecar® HCR 701, in patients with acute or chronic pathologies level of complex cranio-cervical-mandibular. We present 3 protocols used in 3 clinical conditions: muscular disease (i.e. bruxism), acute articular disease (with clicks and / or acute locking) and chronic joint disease (chronic locking with osteochondral lesions).

Results. The therapeutic effect depends on the endothermic effect and rising potential energy of cell membranes. Depending on the power used, three phases can be observed characterized by well-defined biological effects: cellular bio-stimulation, analgesia, increased blood flow and lymphatic drainage.

Conclusions. The results obtained, because of a rapid resolution of the clinical symptoms, allow us to show the Tecar therapy as an effective tool in the treatment of TMD. However, the trial is still ongoing and requires an extension of the series and longer follow-up.

TMJ disorders treated with PRGF articular injection: the effectiveness of growth factors

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Aim. Analyze the effects of TMJ articular injection with PRGF (plasma rich in growth factors) in patients suffering of TMJ disorders with chronic pain.

Methods. 5 patients (average age: 54.2 years, range 49-59 years; all patients were female) suffering of chronic TMJ internal derangement with chewing pain were treated with articular injection of PRGF after occlusal splint therapy. Exclusion criteria: coagulation or platelets diseases. Symptoms and range of motion (ROM) in mouth opening changes were evaluated before the injection (T0) and after one month (T1). Statistical analysis was performed by paired T-test.

Results. The complete resolution of joint pain was obtained in all cases at T1. For the ROM of mouth opening: T0 average 31.0 mm (st. dev. 2.92 mm); T1 average 35.8 mm (st. dev. 3.56 mm). Statistically significant difference ($p < 0.01$).

Conclusions. TMJ articular injection with PRGF (plasma rich in growth factors) provides a significant improvement of clinical conditions leading to a complete disappearance of articular pain and improving the degree of mouth opening.

Visual defects and malocclusions: an epidemiological study in a paediatric population

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Aim. To evaluate the prevalence of visual defects (myopia, astigmatism, strabismus and hyperopia) and malocclusion.

Methods. Two hundred-eighty patients (131 male and 149 female, mean age 12.4 ± 2.7 years) afferent to the Department of Gnathology, School of Dentistry, University of L'Aquila, were screened to assess the prevalence of visual defects and malocclusion. According to malocclusion, patients were classified as Class I (n = 165), Class II (n = 74), Class II Division 2 (n = 17), Class III (n = 24), cross-bite (n = 59) or no cross-bite (n = 221). All the patients were submitted to an ophthalmologic cycloplegic visit for the evaluation of visual disorders. The occurrence rates of visual defects were calculated as percentages of the total sample. Differences in incidence rates of each visual defects by sex, age and malocclusion were analyzed by using chi-square and Fisher's exact tests.

Results. Statistically significant correlations were found between myopia and II Class malocclusion, while cross-bite malocclusions were significantly associated with astigmatism and strabismus ($P < 0.0001$ and $P < 0.003$ respectively).

Conclusions. No significant difference in visual defects by sex and age were found, while prevalence of visual defects was significantly higher in orthodontic patients than in normal occlusion group.

IMPLANT DENTISTRY

A new method to avoid misfits in oral fixed prosthesis and epithesis on implants

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Aim. The passivity of the superstructure fitted onto the abutment in implant-supported prostheses is a vital aspect of implant and epithesis prosthesis success. The higher the accuracy of the master cast, the better result we have on the mesostructure. A plaster jig is proposed to verify the replica position on the master cast compared to the position of the implants in the oral cavity, before the manufacture of the prostheses. MATERIALS AND

Methods. 6 implants and six abutments (Multi-unit Abutment) were inserted onto a metal base. 80 Type IV plaster jigs were made on the metal base in a starting position known as "Standard Position" (SP). Some known horizontal, vertical and angulated movements were created on implant number 4, from SP. The ability of the stone jig to detect such movements, considered as "misfits" from SP, was assessed.

Results. The plaster jig is able to detect variation in positions from the SP. In the horizontal plane it is able to detect 150 microns, in the vertical plane 50 microns and angular differences of about 1°. DISCUSSION AND

Conclusions. A plaster jig is user friendly and of simple construction with a good cost/effective ratio. This jig, built according to data passed on from one step to the other, detects even minimal defects that may compromise the accuracy of both intra and extra-oral implant prostheses. Before the implementation of cast or milled CAD/CAM mesostructures, any errors are corrected in the lab.

A novel surgical approach to increase soft tissue thickness at implant site in aesthetic zone: a 1 year follow up study

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Aim. Advances in implant surgery have recently considered as a main goal, not only implant positioning but also soft tissue reconstruction and management at implant site, to obtain a good esthetic and a good blending with neighboring teeth. The present study aims to evaluate the multiple coronally advanced flap approach, in implant surgery with a bilaminar connective tissue graft. Materials and

Methods. 15 subjects with a condition of mono edentulism in the esthetic zone of the maxilla were enrolled in the study. Implants were inserted with one stage technique and after positioning the healing screw, a connective tissue graft, harvested from palatal site, was added to the multiple coronally advanced flap, at implant site. Then periodontal parameters were recorded on the implant site and on the teeth adjacent to it, at T0, 3 months, 6 months and 1 year.

Results. At natural sites, it was recorded an important enhancement of soft tissue in term of pocket depth (PPD), and recession (REC) even if none of them was statistically significant (from 0.9 ± 1.02 mm to 0.5 ± 0.35 mm, and from 0.9 ± 0.89 mm to 0.4 ± 0.41 mm, for REC at mesial and distal site; from 1.3 ± 0.75 mm to 1.5 ± 0.61 mm for PPD at mesial site). Besides, this surgical approach also resulted, at natural teeth, in a clinically high increase in the width of keratinized mucosa, even if it was statistically significant only at implant site ($p=0.002$), where the connective tissue graft was added.

Conclusions. The results of the present study demonstrated that the proposed surgical approach was a very effective procedure, to get a good enhancement at soft tissue, both at implant and dental sites. Although further studies are needed to get statistically higher results.

A novel technique for minimally invasive sinus grafting with immediate implant insertion and loading

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Aim. In the posterior region of the maxilla, tooth loss is usually associated with alveolar bone resorption, and sinus pneumatization. The mean thickness of the alveolar ridge inferior to the floor of the maxillary sinus has been reported to be 2.8 to 6.1 mm. The aim of this study was to describe a new technique for flapless transcrestal guided sinus lift elevation (TGSL).

Methods. A prospective up to three-year clinical study on 46 patients. The mean residual bone height of the alveolar crest was of 6.7 ± 1.6 mm. All patients were treated by guided surgery (NobelGuide) with implants using the TGSL technique. Overall 138 implants were placed and immediately loaded. All the sites were elevated by transcrestal approach with drills and expanding condensing osteotomes throughout the surgical template. The site was prepared, as planned in the IGS (imaging guide software) step, using a sequence of drills and osteotomes until 1,0 mm just below the sinus floor. The bony sinus floor was fractured by careful tapping, using expanding-condensing. A mean of 500 mg of grafting material (BiOss Collagene. Geistle) was introduced and pressed into each implant site with the last osteotome working until 1 mm to the sinus floor.

Results. The average follow-up period was 32 months. The implant cumulative survival rate was 97.82 % for all the implants. The mean (SD) bone elevation after 4th month was 5.4 mm (± 1.6). The mean (SD) marginal bone remodeling (mesial + distal values average) from immediate loading to the 1st year follow-up was 0.33 mm (± 0.16).

Conclusions. This study suggests that the use of Guided Surgery to perform maxillary sinus grafting is predictable, while reducing the surgical invasivity, patient morbidity and bone resorption.

A prospective medium-term clinical study of different short implants (5-9 mm) survival in the atrophic posterior maxilla

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The aim of this clinical research is to evaluate the survival of short dental implants with a length between 5mm and 9mm inserted into the upper back jawbone with SA-3 type atrophy according to Misch.

The implants derived from two cases (Winsix®, Bicon®), with two different types of fixture-abutment connections.

All the implants were loaded 5 months after their insertion according to the different techniques of dealing with prostheses envisaged by the company which produced them.

The clinical biometrical and radiological data were collected at the moment of the fixture-abutment connection, at 6 months from the loading of the prostheses and in the following 3 years. The patients were followed up until the 4th year of functioning of the inserted implants to evaluate the success of the treatment in the course of time.

No precocious failures were observed and all the implants were completed with permanent crowns. Only one Bicon® implant failed 3 months after the loading of the prosthesis because of a loss of osteointegration.

The study shows that this type of supported-implant rehabilitation in partially toothless arches in people with optimum compliance and made to undergo a regular follow-up therapy can be undertaken with a high percentage of success in the middle term, taking into account that in literature the percentages of failure for the short implants were associated with routine surgical procedures independent of the bone quality and in limited anatomical spots with scarce bone density.

A prospective multicenter study on the immediate loading of mandibular overdentures supported by 4 one-piece unsplinted direct laser metal forming (DLMF) implants. Results from a 1-year follow-up report on 96 implants

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Aim. The aim of this prospective multicenter study was to evaluate treatment outcomes of mandibular overdentures supported by 4 one-piece unsplinted implants placed and loaded immediately, investigating survival and success rate of the implants, marginal bone loss and maintenance complications.

Methods. 96 one-piece DLMF implants (TiXOs Nano OvdR, Leader-Novaxa, Milan, Italy) were inserted in the edentulous mandible of 24 patients in 4 different clinical centers. Four implants were placed in each edentulous mandible. Immediately after implant placement, a mandibular overdenture was connected to the implants. At the 1-year scheduled follow-up examination, clinical, radiographic and prosthetic parameters were assessed. Success criteria included: absence of pain, sensitivity, suppuration, implant mobility, absence of continuous peri-implant radiolucency; distance between the implant shoulder and the first visible bone contact (DIB) <1.5 mm.

Results. After 12 months of loading, the overall implant survival rate was 98.9%, with one implant loss. Among the surviving implants (95), 4 did not fulfil the success criteria, giving an implant-crown success of 95.8%. The mean DIB was 0.28 mm (± 0.30).

Conclusions. Based on these results, the immediate loading of 4 unsplinted DLMF implants by means of ball attachment supported mandibular overdentures seem to represent a safe and successful procedure.

A retrospective study on short 3i[®] machined and Osseotite[®] implants

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Aim. The edentulous posterior regions of the upper and lower jaws may have a mean height of the alveolar process that is suitable for the purposes of dental implants, i.e. at least 6 mm, in 38% of maxillae and 50% of mandibles. The use of a so-called "short" implant may be a valid alternative to more invasive surgical pre-implant bone reconstruction procedures for the prosthetic rehabilitation of patients with severe bone atrophy. The aim of this retrospective clinical and radiological study was to investigate our success rate with short implants (7 and 8.5 mm, machined-surface 3i[®] and Osseotite[®]) implanted from 1992 to 2003 in partially and totally edentulous patients with jaw bone atrophy.

Methods. This clinical and radiological retrospective study was conducted at the Dentistry Clinic of the University of Padova (Italy) and involved 119 patients, 26 men and 93 women, with 290 3i[®] implants (Biomet 3i Implant Innovations, Palm Beach Gardens, FL, USA), implanted between May 1992 and September 2003. The implants were 7 or 8.5 mm in length and 3.75 or 4 mm in diameter. Patients were invited to attend a radiographic and clinical follow-up and their previous clinical files and x-rays were assessed. Radiographic measurements were taken on standardized periapical radiographs obtained by an experienced radiologist using the long-cone technique and the Rynn system (XCP Instruments, Rinn Corporation Elgin, IL, USA). A digital radiological system was used (Vario DG, Sirona Dental System, Bensheim, Germany). The landmarks were established twice, 1 week apart, by two examiners reaching a consensus. Linear distances between landmarks were measured in millimeters. The following linear measurements between landmarks were taken: (1) anatomical crown length (perpendicular distance from the implant shoulder to the most coronal aspect of the crown); (2) anatomical implant length (perpendicular distance from the implant shoulder to the most apical aspect of the implant); and (3) crestal bone level (perpendicular distance from the implant shoulder to the first visible apical bone-to-implant contact in the mesial and distal aspects of the implant). Real measurements were calculated with the rule of three using the real implant length or the distance between threads as the reference values. The precision of the radiographic measurements was calculated by comparing the values of the first and second radiographic readings. In addition to the survival of the implant and prosthesis, we also considered the degree of peri-implant marginal bone resorption and the crown/implant clinical ratio.

Results. The mean time from stage-one surgery to latest follow-up was 10.3 years (range 4.5-16.33 years). Eleven implants were in the maxilla (9 of them in the posterior part), 279 in the mandible (257 of them in the posterior part). One hundred fifty one of the implants were 7 mm long and 139 were 8.5 mm long. The cumulative survival rate was therefore 96.8% (9 implant was lost for both sizes). We used 171 implants with a smooth surface (machined-surface 3i[®]), 153 of which were 7 mm long and 18 were 8.5 mm long (survival rate 97%) and 119 implants with a roughened surface (Osseotite[®] implants), and all implants were 8.5 mm long (survival rate 96.6%). The mean bone resorption for the 7 mm implants was 1.51 mm mesially (SD 0.42) and 1.32 mm distally (SD 0.47); for the 8.5 mm implants it was 1.40 mm mesially (SD 0.48) and 1.38 mm distally (SD 0.49). There was no statistically significant difference in terms of bone resorption between the two different implant lengths (7 vs 8.5 mm; p-value=0.7450) or diameters (3.75 vs 4 mm; p-value=0.8331), or the smooth and rough implant surfaces (p-value=0.2485). The implants were fitted with fixed bridges, or splinted bridges for implants more than 8.5 mm long. These two prosthetic rehabilitation solutions were compared in terms of peri-implant marginal bone resorption and no statistically significant difference came to light. When the implant-prosthesis combinations were classified by crown-implant clinical ratio in three groups ($C/I \leq 1.4$; $1.4 < C/I < 1.7$; $C/I \geq 1.7$), there was a statistically significant difference in the mean marginal bone resorption between the three groups. Discussion and

Conclusions. The cumulative survival rate for the 7 and 8.5 mm implants in our series was 96.8%, a result comparable with other reports in the literature. The different implant lengths, types of prosthetic rehabilitation, and types of surface finish on the implant do not appear to influence implant survival. Short implants appear to be a valid option for patients with severe atrophy who either prefer to avoid or are unsuitable for pre-implant bone reconstruction surgery, since they seem to achieve much the same results as longer implants in terms of implant survival.

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Accuracy of zygomatic implants using CAD/CAM surgical template

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Aim. The aim of this study was to investigate the possibility to use zygomatic implants in patients with serious atrophy of the upper maxillary and excessive pneumatization of the maxillary sinus as alternative to sinus lift.

Methods. At the Department of Oral Sciences of "Sapienza" University of Rome were selected 2 patients, total edentulous in the posterior maxilla, in the period between April 2010 and June 2010. The implant treatment was planned by using a simplant software. The maximum of implant's length to reach the the zygomatic process of the maxillary was 34 mm, the least length was 30 mm. The zygomatic implants were applied with local anaesthesia, via transmucous membrane (flapless), with the aid of a surgical guide (SurgiGuide) realized by stereolithography. For each case treated has been evaluated the deviations between the planned and the placed implants by using mimics, which is a software that allows to pairs-wise align the pre-operative 3D representations of the jaws (maxilla + zygomatic planned implants) with their counterparts in the post-operative images. Typically an iterative closest point (ICP) algorithm is used to match the jaws.

Results. The maximum angular deviation, calculated as 3D angle between the longitudinal axis of the planned and placed implant, was 9,8 degrees; the maximum global deviation, defined as the 3D distance between the apical centres of the corresponding planned and placed implants was 2,8 mm.

Conclusions. Zygomatic implant is a substantial alternative to sinus lift, but in order to avoid significant angular deviations it is necessary to make a highly defined TC and an accurate surgical guide.

Advanced implantology with PRP growth factors

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The term “advanced implantology” indicates surgical operations performed according to well-defined protocols, in order to solve anatomical situations that, due to lack of bone, reabsorption caused by atrophy, and other reasons, did not allow for implant placement. On the contrary, they constituted a contraindication because the bone was not present in adequate quantity and quality for fixture placement and to allow for force release transmitted to the bone by mastication loads. Thanks to a CT scan and derived programs, a 3D model was elaborated reproducing all the fundamental parameters, such as thickness, height and bone density. This allowed to visually understand bone loss and to deal with growth factors through competence and modern regeneration techniques (Bone regeneration with PRP). In the present work, the authors report the implant rehabilitation of 2 middle-aged patients in the posterior palatal area, also thanks to the use of PRP (Platelet-Rich Fibrin) activated with calcium chloride, which is used for platelet degranulation and thus to obtain PRF +Bio-Oss. Clinical and radiographic follow-up examinations six months after implant placement showed a clear implant success. Overall, advanced implantology has allowed to solve all those cases considered not suitable for implant treatment, such as: atrophic crestal sinus lift and expansion, split-crest, maxillary sinus lift and alveolar nerve shift. This gives hope and comfort to the patient carrying totally or partially mobile prostheses with all their disadvantages, or prostheses screwed on few implants needing recurrent and short-term check-ups.

Alveolar ridge dimensions in maxillary posterior sextants. A retrospective comparative study of dentate and edentulous sites using computerized tomography data

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Aim. To compare the alveolar ridge dimensions between edentulous sites and contralateral dentate sites of maxillary posterior sextants in the same individuals.

Methods. Computerized tomography (CT) scans of 32 patients with one fully edentulous and one fully dentate maxillary posterior sextants were analyzed.

Results. When compared to dentate sextants, edentulous sextants showed (i) a lower BH at second premolar, first molar and second molar sites, which was associated with a more coronal position of the maxillary sinus floor at second premolar site; (ii) a more apical position of the ridge at second premolar and second molar sites; (iii) a lower BW1mm at first and second premolar sites, and a lower BW3mm at all sites, (iv) a lower, although not significant, prevalence of premolar and molar sites with $BH \geq 8$ mm and $BW1mm \geq 6$ mm.

Conclusions. The edentulous sextants in the posterior maxilla showed a reduced height and width of the ridge when compared to contralateral dentate sextants. The reduced vertical dimensions observed in edentulous sextants were variably associated with ridge resorption as well as sinus pneumatization.

An implant is forever? Implant survival at a distance, a medical-legal parameter to reconsider the assessment of future renewals

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The implant system has been a revolution in dentistry, providing a substantial contribution to the dental remedy the damage. The encouraging results have resulted in high expectations and estimates of service life of the plants rather large, although it is still artificial elements and "not alive", aimed at restoring function lost or reduced in the inevitably partial. Much has been written in the literature on the life of a plant, but we must consider that the patients used for these studies are selected with strict criteria that clearly deviate from office practice and these guidelines are often inapplicable in a situation where the demand for treatment Implant Prosthetics is becoming more widely among the population. The work aims to make a medical-legal literature review to try to find a parameter to be considered on the legal and medical implant survival after many years and any assessment of future renewals. In conclusion our work has therefore set the goal of achieving a research on the current state of things.

Assessment of pain associated with insertion torque of dental implants. A prospective, randomized-controlled study

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Aim. Dental implants have been widely used to retain and support cross-arch fixed partial dentures. This study investigated pain experience following dental implant placement in relation to insertion torque using questionnaires.

Methods. A total 80 implants were placed in 20 patients. Each patients received a total of 4 implants at different times (one implant every 40 days). At each time the peri-implant bone levels were evaluated on intraoral radiographs taken with the paralleling technique. The implants were placed with a dynamometric key at 35N, 50N, 65N, 85N. Patients were asked to evaluate their pain experience during surgery, 24 hours after surgery, and at 2 days, 4 days, 1, 2, and 4 weeks after surgery on special pain assessment forms. Pain was assessed using a descriptive numerical rating scale of 0 to 10, with 0 indicative of no pain and 10 representing the worst pain imaginable. Patients were instructed that a score of 1 to 3 was indicative of mild pain, 4 to 6 was indicative of moderate pain, and 7 to 10 was indicative of severe pain.

Results. A significant correlation pain scores and insertion torque was found between group III and group IV vs group II and group I during surgery, at 24 hours, 2 days, 4 days, 1 weeks, 2 weeks $p \leq 0.05$. No statistical difference was found between group I vs group II.

Conclusions. In conclusion, elevated insertion torque values produces pain and also resorption of the crestal bone around the implants.

Bone regeneration with PRP growth factors in association with filling biomaterials: a case report

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Aim. PRP (Platelet Rich Plasma) is a reservoir of growth factors (PDGF,TGF- β ,IGF-1,FGF,EGF), which can stimulate several cellular mechanisms such as angiogenesis, macrophage chemotaxis, fibroblast proliferation and collagen synthesis. The aim of the present study is to prove the short-term and long-term effectiveness of using PRP, in association with filling biomaterials, for bone regeneration of atrophic areas in implantology.

Methods. We present the case of a 40-year-old female patient with a fixed prosthesis. In one surgery, we avulsed tooth 15, performed Summer's crestal sinus lift by placing PRP-imbibed fibrin sponges and then we placed 2 implants; PRP was obtained by sampling autologous blood in sterile test tubes without anticoagulant and by centrifugation.

Results. Postsurgical orthopantomography (OPT) showed a hyper-transparent sinus (empty), indicating the complete absence of bone grafts and only the presence of PRP-imbibed fibrin sponges; OPT and CAT scan performed 6 months after surgery revealed a radiographic integration and an increased density of the peri-implant bone.

Discussion and conclusions. PRP growth factors, associated with fibrin sponges substantially acting as a scaffold, allowed to achieve a satisfying neo-apposition and bone regeneration, as proved by long-term radiological examinations. The combined use of PRP, associated with filling biomaterials, is certainly a very interesting technique, which deserves long-term clinical investigations and prospective, experimental studies on a statistically-significant number of patients, with strict and well-defined inclusion criteria and without statistic bias.

Clinical and histologic effectiveness of a Allogenic Cortico-Cancellous Bone Block associated with a platelet-rich fibrin membrane in the mandibular vertical bone crest augmentation. A series of 7 consecutively treated cases

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Aim. The purpose of this report was to show the clinical and histologic effectiveness of a Allogenic Cortico-Cancellous Bone Block (ACCBB) associated with a platelet-rich fibrin (PRF) membrane to obtain vertical bone crest augmentation in the mandible. MATERIALS AND

Methods. 7 systemically healthy non-smoking patients,, with mandibular edentulia associated with vertical bone loss were treated. After elevation of a full-thickness flap, a ACCBB was fixed by osteosynthesis screws to the edentulous site and covered by autogenous bone chips and a PRF membrane. After periosteal incision, the flap was coronalized and sutured. 6 months after surgery, implants were placed and a bone biopsy was harvested. Bone crest level was radiographically measured at baseline and 3, 6 and 12 months after the grafting procedure.

Results. Postoperative radiographs showed the good integration of the grafts and a satisfactory bone mineralization with the formation of new cortical bone. At the second stage surgery, it was possible to confirm the graft integration; new mineralized bone formation was confirmed by the histologic analysis. DISCUSSION: This technique allows the clinician to add the osteoconductive properties of ACCBB to the bioactive molecules provided by the PRF membrane.

Conclusions. The adjunct of PRF membranes to ACCBB allows very good results in terms of bone regeneration and histologic bone quality.

Co-induction for conscious sedation in implantology

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Aim. Evaluation of additive or antagonistic effects caused by combined administration of orale chlordemethyldiazepam (CDDZ) 2 mg and Nitrous Oxide (N₂O) by inhalation.

Methods. 40 patients scheduled for dental implant surgery and divided in two randomized groups. pre-sedation was performed in 20 patients using 2 mg of oral chlordemethyldiazepam 30 minutes before inhalation at base-line levels and with placebo in the other group. Pre- intra- and post-operative tranquillity, N₂O base-line levels, postoperative psychomotor skills, incidence of excitatory symptoms were assessed.

Results. Pre-and post-operative tranquillity was greater in CDDZ treated patients whereas, intraoperative tranquillity was maximal in both groups. In the CDDZ treated group the total incidence of presymptoms was lower ($p < 0,05$), more precisely, "warm sensation" ($p < 0,01$), "vibration" ($p < 0,05$), "dry mouth" ($p < 0,05$) and "mouth and lips anesthesia" ($p < 0,01$). Signs of perioperative sedation were not observed.

Conclusions. the co-administration of CDDZ 2 mg per os and N₂O by inhalation at base-line levels do not causes sedative effects by summation or synergy, instead it causes an increment of pre-and post-operative tranquillity associated with high safety level. The lower incidence of some pre-symptoms has been interpreted as a consequence of different activity at cellular receptor level of benzodiazepines and N₂O. The benzodiazepines increase the inhibitory effect of GABA-A receptor and N₂O decreases the excitatory effect on NMDA receptor, with consequent antagonism.

Columbus bridge protocol: Surgical-prosthetic template in full arch immediate loading rehabilitation

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Topics b. Preprosthetic Surgery and Implant Surgery To describe a clinical and laboratory procedure to create a surgical-prosthetic template for implant positioning in full arch, immediate loading rehabilitations according to the Columbus Bridge Protocol. Use of clinical, radiographic and laboratory information (aesthetic evaluation, ct scan, periodontal chart) will aid in choosing between a full mouth Toronto rehabilitation with the addition of flange as gingivae, or a natural fixed bridge without the addition of gingivae. A cast of the interested arch will be poured, followed by two casts of the opposing arch. Centric relation will be obtained by Dawson bi-mandibular manipulation or McGrane central bearing point technique, and recorded using both thinner and thicker wax. Two casts will be positioned in centric relation on the articulator with the help of thin wax. The cast of the opposing arch will then be unscrewed and the second cast positioned with the thicker wax on the same articulator. After making an aesthetical evaluation, a clinical assessment will be made to decide if it is feasible to maintain the patient's smile line or whether if it is better to recreate it. In the latter case the cast of the arch to rehabilitate is cut to bone level and a dental wax-up of the arch is made. The first part of the template is obtained by pouring acrylic resin onto the imprint of the arch previously recreated. The internal part of the cast is removed, leaving 2 mm buccally, in order to facilitate the positioning of the template. An acrylic resin support is created on the opposing arch which is then connected to the template previously constructed with the casts in relation by the use of the thick wax. In upper arch rehabilitation the template will lean on the antagonist teeth/mucosa and on the maxillary tuberosity/palatal arch. In lower arch rehabilitation the template will lean on the antagonist teeth/mucosa and on the retromolar trigone. The use of a template will help in the choice of appropriate conical abutments, in order to correct implant inclination and it is fundamental in natural fixed bridge rehabilitation where the implant has to be inserted in the position of the future prosthetic tooth. Screw retained prosthesis is useful in full arch, immediate loading rehabilitation but a correct planning and the use of a surgical-prosthetic template is essential to achieve success.

Computer assisted implantology in atrophic ridges. Early loading

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Aim. The aim of this study was to evaluate osseointegration in early loaded implants inserted in atrophic ridges.

Methods. 10 patients (both sexes, 41 years mean age, well healthy, no smokers) having atrophic alveolar ridges and asking for implant supported prostheses were selected. 21 implants (BT-Tite CV3, BTLock, Italy) were inserted together with tricalcium sulphate and CGF (concentrated growth factors) membrane (Silfradent, Italy). Minimum implant diameter was 3.75mm and minimum length was 11.5mm. The implants were planned by SimPlant software (Materialize, Belgium). The primary implant stability was estimated by RFA. When the ISQ resulted ≥ 57 value, in the 2nd stage surgery, they were early loaded with temporary resin crowns (2.5 months from surgery). The ISQ values were subsequently estimated every month until the 6th month. The endoral X-rays have been executed to 0, 1, 3, 6 months.

Results. In the 2nd stage surgery, a complete bone defect filling was observed in all the cases except one that was characterized by partial bone defect filling (greater than 50% and without flap dehiscence). The most significant ISQ values increase, was observed in the first 2 months; a further ISQ value increasing was observed until the third month and successively it leveled on constant shares. At the end of the third month just 2 implants inserted in one patient didn't show 57 ISQ value. They showed clinical mobility in early time (first month) and they were removed and indicated like failures. The endoral X-ray didn't show any change of the marginal bone level. Clinical and X-ray results analyzed with T-Student test were statistically significant ($P < 0.005$).

Conclusions. These results showed as computerized implantology is a valid technique to restore atrophic ridges.

Dimensional ridge alterations following immediate implant placement in molar extraction sites

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Methods. Twelve subjects received 12 immediate transmucosal implants in molar extraction sites. Peri-implant defects were treated according to the principles of Guided Bone Regeneration by means of a deproteinized bone substitute and a bioresorbable collagen membrane. Changes in vertical (IS-BD, CREST-BD) and horizontal distances (EC-I, IC-I) of alveolar bony walls to the bottom of the defects (BD) and to the implant surfaces (I) were compared between implant placement and surgical re-entry at 6 months.

Results. The implant survival rate at 6 months was 100%. Statistically significant differences ($P < 0.01$) were observed in the mean changes in vertical distances IS-BD and CREST-BD between baseline and re-entry. At re-entry, all peri-implant marginal defects assessed from the internal socket wall to the implant surface (IC-I) were healed. The residual combined thickness of the buccal wall with the newly formed peri-implant bone at sites with an initial thickness of 1 mm was statistically significantly smaller ($P < 0.05$) compared with that of sites with an initial buccal thickness of 2 mm (2.50 ± 0.76 vs. 4.00 ± 0.00 mm). Table 2 illustrates the mean changes \pm SD in vertical distances (IS-BD and CREST-BD) as well as in horizontal distances (EC-I and IC-I) assessed at both mid-buccal and mid-oral sites with respect to the initial thickness of the alveolar bony wall. Statistically significant ($p < 0.05$) mean changes were observed at both the mid-buccal and the mid-oral aspects for the vertical distances IS-BD and CREST-BD as well as for the horizontal distances EC-I and IC-I. Irrespective of the initial thickness of the alveolar wall, complete fill of the periimplant marginal defects was observed between the internal aspect of the socket wall and the implant surface (i.e. IC-I) at both the buccal and the oral aspects.

Conclusions. The marginal defects around immediate implants placed in molar extraction sites were completely filled after 6 months of healing through de novo bone formation. Bone resorption was observed from the external aspects of the buccal and oral socket walls. Dimensional changes of the external socket walls were more pronounced at the buccal aspects.

Effect of low-level laser irradiation on osteoblasts proliferation and bone formation

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Aim. Applications of laser therapy in biostimulation and healing of injured tissues are widely described in medical literature. The present study focuses on the effects of laser irradiation on the growth rate and differentiation of human osteoblast-like cells seeded on titanium or zirconia surfaces.

Methods. Cells were laser irradiated with low therapeutical doses at different intervals and the effects of irradiation were evaluated at each time point.

Results. After 3 hours lased cells showed an enhanced mitogen activity compared to non-lased control cells and a higher alkaline phosphatase activity, marker of bone formation. At the same time the mRNA of RUNX2 and OSTERIX, two genes involved in osteoblast differentiation, showed a clear decrease in lased cells. This reached the lowest value 6 to 12 hours after irradiation, after which the transcripts started to increase indicating that the laser treatment did promote the osteogenic potential of growth-induced cells.

Conclusions. These results indicate that Low Level Laser Treatment (LLLT) stimulates osteogenic cell proliferation.

Evaluation of the degree of differentiation of human Mesenchymal Stem Cells on a laser-modified titanium surface, compared to machined-modified and sand-blasted ones: preliminary results

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Aim. The aim of our study was to evaluate the property of a laser-modified titanium surface of promoting a faster differentiation of human Mesenchymal Stem Cells (hMSCs) into osteoblasts. Furthermore, we wanted to evaluate if titanium alone was a sufficient factor able to induce the differentiation towards the osteogenic lineage.

Methods. We harvested stem cells from an individual (after his consensus) and cultivated them into dishes with titanium disks presenting three different surfaces: machined (M), sand-blasted (S) and laser-modified (L). In the test group cells were cultivated in an osteogenic medium, while in the control group cells were seeded in a standard Dulbecco's Modified Eagle's Medium. Evaluations of the degree of differentiation were made with Alizarin coloration after 28, 38, 42, 49, 56 and 63 days of induction.

Results. No signs of differentiation were evident in the control group, while in the test group there were evidence of differentiation since the fourth week. Laser-modified and sand-blasted surfaces showed similar values, greater than the machined surface. Discussion: the differentiation reached its peak on the sixth week for the laser-modified surface, and on the seventh week for the other two surfaces. After the peak, the differentiation had a slow decrease for the laser-modified surface and a rapid decrease for the other two.

Conclusions. Titanium alone can't be considered a sufficient factor able to induce differentiation of human Mesenchymal Stem Cells into osteoblasts. Moreover, laser-modified induces a faster differentiation of stem cells and a more stable connection between osteoblasts and titanium.

Experimental evaluation of loading effect on implants primary stability

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Aim. Primary stability is one of the basic conditions for osseointegration and only a micromotion between 50 and 150 microns is tolerated. The variables involved are: bone quality, type and time of loading. The aim of this experimental study was to evaluate the force required to obtain a 150 micron implants micromotion. To investigate this topic a biomechanical bone model, reproducing bone quality type 2 (sawbones), was used.

Methods. Two types of dental implants with different pitch and height of the thread were inserted (10+10). Axial load was applied on each implant: progressive ramp loading (0 to 900 N in 1 sec.) and implants micromotion was evaluated by a extensometer applied to an INSTRON machine and average values were calculated.

Results. 150 micron threshold was exceeded at 390 N in dental implants with low pitch and height thread and at 511 N for dental implants with bigger thread pitch and height.

Conclusions. Nevertheless the limitations of this study (experimental sawbones, single implant, axial loading), values obtained are comparable with immediate loading forces generated in the oral cavity during chewing. In particular these results suggest that immediate loading in anterior and premolar region might be safer than in molar areas were occlusal forces overcome these values.

Fresh frozen homologous bone grafts in IV Cawood-Howell atrophy: a randomized controlled comparison to autologous bone blocks

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Aim. To assess the performance of homologous bone block (HBB) grafts vs autologous bone block (ABB) grafts in case of horizontal ridge atrophy.

Methods. Fourteen patients were enrolled and randomly allocated to a Test group and a Control group. At T0, patients underwent surgical bone grafting: in T-group, a fresh frozen bone block from tibial hemi-plate (Banca cellulare e del tessuto muscolo/scheletrico, IOR, Bologna, Italy) was grafted, fixed with screws and covered with a collagen membrane (Osseoguard, 3i Biomet, USA); in C-group, a block graft was collected from an intraoral site and positioned similarly. After 6 months (T6), implants were placed and bone biopsies were taken. CT scans were carried out after bone augmentation (CT-T0) and some days before implant surgery (CT-T6). Volume (VOL) variation, minimum (MIND), maximum (MAXD) and mean (MEAND) bone graft densities were calculated for CT-T0 and CT-T6. Six months after placement, implants were exposed and healing screws positioned, followed by prosthetic rehabilitation.

Results. No complications related to surgeries were reported. All implants reached primary stability. One implant in T-group failed 2 weeks after surgical exposure. In T-group, VOL-T6 was 38.3% of VOL-T0; in C-group, VOL-T6 was 67.3% of VOL-T0. MEAND-T6 increased respectively by 20,9% for T-group and 1.2% for C-group as compared to MEAND-T0.

Conclusions. HBB volume reduction seems to be higher than ABB, largely dependant on initial density of the graft. The variability of the resorption is high.

Full-arch "All-on-four" rehabilitation of edentulous mandible: a case report

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Implants insertion in the interforamina region is a suitable technique for a full arch rehabilitation of edentulous mandible. The purpose of this work is to present a case of full arch rehabilitation according to the "All-on-four" technique. A 72 years-old edentulous patient was referred for rehabilitation of lower jaw. The X-Ray examination showed a severe bone resorption of the posterior mandibular ridges, and an adequate bone height in the interforamina region. A crestal incision was made to raise a full thickness flap and four Osseospeed implants were installed according to the manufacturer's guidelines (Astra Tech Dental) anterior to the mental foramen. Implants were covered underneath the mucosa (two-stages technique) and kept unloaded for two months before loading. Uni-abutments were inserted after implants connection and appropriate impression copings were connected to the abutments. Impression was taken using an open impression tray and sent to the dental technician. The final screw-retained cantilever bridge was screwed into place. The 1-year follow up indicates that the "All-on-four" technique is feasible treatment option for cross-arch rehabilitation in the mandible.

Guided bone regeneration (GBR) in peri-implantitis with PRF® associated to heterologous particulate bone

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Aim. GBR is an innovative method in the treatment of peri-implant areas with progressive resorption of the support bone, as a consequence of the onset of a bacterial peri-implantitis. Along with surgical trauma and overload, peri-implantitis is identified as the main cause of implant failure. The aim of the present work is to show the effectiveness of the combined use of PRF with heterologous particulate bone (Bio-Oss) for GBR of areas with peri-implant bone deficit, secondary to a peri-implant disease.

Methods. 8 50-year-old male patients with previous implant rehabilitation were recruited; the patients had no systemic diseases and presented with clinical, radiographic signs of peri-implantitis and a poor plaque control. We performed: 1) periodontal preparation, 2) implant debridement with titanium curettes, 3) disinfection of the surgical site, 4) GBR with the association of PRF/Bio-Oss and PRF membranes; PRF was obtained by autologous blood sampling in sterile test tubes without anticoagulant and centrifugation.

Results. Clinical, radiographic examinations 4 months after regenerative surgery showed an excellent healing of peri-implant soft and hard tissues with a significant increase of the radiographic bone level, good probing reduction and implant stability.

Discussion and conclusions. The combined use of PRF/Bio-Oss allows to add the angiogenetic and osteoinductive properties of the fibrin matrix rich in platelets, leucocytes and growth factors PDGF, TGF- β , IGF-1, to the mainly osteoconductive properties of Bio-Oss. Besides, PRF can be molded into a membrane and can stabilize the clot avoiding the use of other membranes or barriers. Regeneration of peri-implant soft and hard tissues proved satisfactory in quantitative/qualitative terms, with a reduced regeneration time.

Histological evaluation of peri implant soft tissue on different surfaces

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Aim. Is to effectuate a micro structural analysis on the response of peri-implant tissues on different healing abutments surfaces and morphologies.

Methods. Standard Titanium healing abutments (EP Healing Abutments, Biomet 3i, Palm Beach Gardens, FL) were duplicated and reproduced with reduced diameter of 1 mm using LR white inclusion resin. Then were coated with a layer of gold of about 20µm thick to have fine sections. After a four weeks healing period the tissue in excess was removed through plastic surgery remodeling the peri-implant mucosa similar to that of natural teeth. The specimens from three patients were analyzed.

Results. The oral side demonstrated a flattened stratified epithelium supported by a tunica propria. The connective tissue papillae penetrates the epithelial layer into vessels and nerves. While the implant side was free of epithelial wedges. Collagen fibers had a variable orientation and in some areas an inflammatory infiltrate was present. There is a statistically significance difference ($P=0,004$) on vessel density between groups.

Conclusions. The peri implant soft tissue on machined Titanium HA presents a scarce inflammatory infiltrate and a casual collagen fibers organization. The presence of a tear para- keratinized epithelium in some areas let some interrogatives on the screwing and un screwing clinical techniques. Moreover, if this is associated to the poor presence of vessels and papillae on connective tissue.

Iatrogenic injury to the inferior alveolar nerve in implant surgery: a case report

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Aim. The surgical placement of implant fixtures in human jaws represents now almost a routine intervention. However this procedure is not risk-free, as the failure to osseointegration or worse the damage to neurovascular structures, when the surgical planning does not consider the accurate evaluation of first level radiographic exams. This work describes a clinical case of iatrogenic inferior alveolar nerve injury due to incorrect implant placement. The implant fixture is removed and the patient is kept under observation at our private clinic.

Methods. The patient, (male sex, aged 40) came to our attention complaining a sensory disturbance after a surgical operation of implant rehabilitation performed by his dentist few weeks before. After performing a careful anamnestic, physical and radiographic examination (periapical intraoral radiography) we prescribed to the patient a 3D Cone Beam CT scan. This exam showed us that the implant fixture was positioned in the mandibular canal with its apical portion, damaging the inferior alveolar nerve. The implant fixture was removed surgically, and the patient was included in a monitoring program for 6 months. After this time, the patient has not regained the complete sensitivity, and he is still under observation.

Results. The iatrogenic injury to inferior alveolar nerve are troublesome, causing problems with speech and chewing and adversely affect the patient's quality of life. They also constitute one of the most frequent causes of complaints and litigation.

Conclusions. These complications can be prevented through the evaluation of first level exams as CT scan, before planning a surgical operation of implant placement in the maxillary bones. However, the neurovascular structures damage risk can never be undone, given the numerous anatomical variations of the inferior alveolar nerve.

Immediate fixed implant rehabilitation of the atrophic edentulous maxilla after bilateral sinus floor augmentation: a 12-month pilot study

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Aim. This prospective clinical study evaluate a surgical/prosthetic protocol for the immediate definitive rehabilitation of the augmented edentulous maxilla and to compare the outcomes of implants placed in grafted (test) versus native (control) sites under the same restorative conditions in the same patients.

Methods. 22 patients were treated with a bilateral sinus augmentation procedure using a 50:50 composite graft of autogenous bone and bovine hydroxyapatite. After 4 months, 155 implants, 90 test and 65 control, were placed with a minimal torque value >25 Nwc and restored with screw-retained fixed definitive prostheses supported by titanium frameworks within one week. All patients were followed for 1 year. Implant stability quotient (ISQ) measurements and radiographic evaluation of the marginal bone resorption (MBR) were performed.

Results. 2 test implants failed in 2 patients, giving a cumulative 1-year success rate of 98.7%; the prostheses success rate was 100%. Significantly lower ISQ value was assessed for test than for control implants during the study (unpaired t-test, $P < .0001$). The mean MBR recorded after 1 year was minimal and no statistical difference was observed between test and control implants (0.47 ± 0.25 mm, control; 0.43 ± 0.21 mm, test).

Conclusions. The combination of implants placed in sinus-grafted and native sites in totally edentulous patients and immediately loaded with a fixed full-arch prosthesis yielded short-term successful outcomes.

Immediate full arch occlusal loading with Seven and Mistral Implants

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Aim. Prosthetic rehabilitation with implant-supported prosthesis in the atrophic edentulous maxilla often requires a bone augmentation procedure to enable implant placement and integration. This paper reports the preliminary data from a clinical study of immediately loaded, full-arch, screw-retained prosthesis with distal extensions (hybrid prosthesis) supported by Mistral and Seven implants placed in the edentulous maxilla. PATIENTS AND

Methods. Five patients who received 60 implants were enrolled in this study. All patients received all implants immediately loaded and the metal framework temporary prosthesis within 4 hours of surgery, and the hybrid prosthesis, made of a titanium framework and acrylic resin teeth, was placed after 3 months with no additional surgery. Marginal bone loss was monitored via periapical radiographs by a computerized technique.

Results. One failure (out of the 60 immediately loaded implants) occurred after 3 weeks of function because of infection. A cumulative success rate of 98.9% was achieved for up to 18 months of follow-up, while the prosthetic cumulative success rate for the same period was 100%. RFA measurements of Seven and Mistral implants showed an increased ISQ value with time, indicating an increased stability. Marginal bone loss at the immediately loaded implants was within the generally accepted conventional limits for standard delayed loading protocols.

Conclusions. The preliminary results of this study suggest that rehabilitation of the edentulous maxilla by an immediately loaded prosthesis supported by 6 implants may represent a reliable alternative treatment to the classical delayed loading protocols.

Immediate implants supporting single crown restoration: a 5-year prospective study

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The placement of implants at the time of tooth extraction has several clinical advantages, and can satisfy the patient's continuously increasing expectation for shorter rehabilitation time. The aim of this study was to evaluate the 5-years clinical success of 30 single-tooth implants inserted immediately after tooth extraction and restored the same day with non-functional loading. The implants were inserted in fresh extraction sockets of 30 patients aged 18 to 70 years and immediately restored with temporary abutments and crowns. All experimental sites showed an absence of fenestrations or dehiscences of the bone walls. Patients underwent a clinical and radiographic evaluation annually. During the 5-years follow-up period, one fixture was removed 4 weeks after implant placement following an abscess. All remaining implants healed uneventfully with no complications and were assessed as stable and successful at the 5-years checkup. No technical complications such as screw loosening, resin fracture, or pain during chewing were registered during the follow-up period. Implants placed into fresh extraction sockets and immediately restored showed a very high cumulative success rate (96.7%) in a 5-year prospective study. Moreover, this treatment protocol eliminates the need for removable provisional restoration and seems to maintain the preexisting architecture of soft and hard tissues in most cases.

Immediate load: a case report

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Aim. The evolution of dental implantology has allowed for a prompt treatment of the most demanding patients, reducing the patient's functional and aesthetic deficit through an immediate rehabilitation.

Technique. "One to one" immediate load is a technique which focuses on the study of occlusal loadforces, through a perfect balance between the edentulous width and the number of implants inserted.

Clinical case. The clinical case concerns a 75-year-old female patient with a mobile prosthesis, suffering from resin allergies and wanting to have an implant inserted. Hematochemical investigations were performed, which were all normal, together with a CBM (Computerized Bone Mineralometry) of the vertebral column and femur, because she had been taking strontium ranelate for several years to maintain her bone balance. After dental scan and orthopantomography, she underwent implant surgery.

Conclusions. We have to stress the importance of the patient initial analysis, to carefully analyze the quality and quantity of bone available in the interested region and, then, to pay particular attention to the implant occlusion, in order to avoid implant fractures due to overload and implant loss. Finally, we underline the choice of manufacturing single crowns, with the double function of promoting good oral hygiene and achieving an appearance similar to natural teeth, which obviously affects the mucogingival aspect.

Immediate loading of dental implants and diabetes: a 24 months clinical study

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Life expectancy of individuals continues to increase, so implantologists providing dental implants treatment can expect to see an increasing number of patients with several systemic diseases such as diabetes mellitus. Multiple implant supported crowns in the recent past has become the treatment of choice for multiple tooth replacement, even in patients with type 2 diabetes, although these patients have to accept several surgical and prosthetic intervention. Osseointegrated implants have been found to result in a high long term success rate. Several studies have reported immediate loading of implants and demonstrated predictable results for this treatment approach. Most used implant systems have documented long-term survival/success rates of crowns on implants that compete favorably with the traditional FPD. The aim of this clinical study was to demonstrate the effectiveness of immediate loading procedures on type 2 diabetes patients. Ten patients with partial dentures and mobility grade 3 remaining teeth have been enrolled in the study. Sixty implants have been positioned in the maxilla and the provisional crowns have been screwed to the implants and loaded at the surgical time. Clinical controls have been performed every 15 days for 12 weeks, radiological controls every 4 weeks for 12 weeks and RFA measurements have been done at time 0, 12 weeks and 6 months. No significant clinical and radiological complications occurred during healing and follow up. The implants stability variations confirmed successful healing. An overall success of 100% of all implants was obtained at the 24 months observation.

Impianto custom made with direct laser metal forming: case report

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Aim. This article presents a clinical case solved by a completely new protocol prosthetic implant. Modern technologies in radiographic images acquisition combined with 3D models created by specific software permit to create using the Direct Laser Metal Forming (DLMF) technology “custom made” implants which are the original perfect reproduction of substituted original radicular unite, true clones.

Methods. This new protocol is applied on a selected female patient presenting vertical fracture of the second upper right premolar, by a CT scan reproduction we can create a root 3D virtual model. After a laser, makes this model by the sintering of nano-particles of titanium from titanium powder. The root, which includes an abutment, allows the immediate prosthetic rehabilitation (Method Silveti-Combe). Performed the extraction, the custom made was immediately inserted into the post-extraction socket and restored with a single crown.

Results. After one year custom made is perfectly integrated and bone loss is insignificant.

Conclusions. The Custom Made can combine the complex needs of biological, mechanical and prosthetic applications in a post-extraction protocol with immediate modern prosthetic rehabilitation. Obviously, given the small number of implants in the world today Custom Made (8), we have to wait for larger numbers give more reliable results.

Implant site preparation into extraction sockets: ultrasonic surgical technique versus twist-drill technique

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Aim. In this study we present the clinical results using the piezoelectric implant site preparation, in respect of the anatomical structure of extraction sockets (bone septum and cortical bone) due to optimize the dental implants insertion with high intra-operative control.

Methods. In 15 cases we used traditional extraction and implant site preparation techniques; other 15 cases were treated with Piezosurgery® technique. For the first extractions we used traditional instruments such as Bein elevator, Heiss bur and Forceps, on the other hand for the ultrasonic surgical technique we used extraction inserts EX1, EX2 and EX3. Pluriradicular teeth were approached as monoradicular, using odontotomy and rizectomy. For the implant site preparation we used twist drill technique in 15 cases and ultrasonic inserts IM1, IM2A/P, IP2/3, IM3A/P in others 15 cases. Totally we inserted 30 implants (∅ 4 mm). The gap into sockets were filled with biomaterials (GenOss) and PRF (fibrin riched plasma).

Results and conclusions. The ultrasonic surgical technique is safer and excellent to preserve anatomical structures. Specific inserts for the extractions result very useful in case of ankylosis due to extreme cutting precision. In contrast with the twist-drill technique, the piezosurgical one let the intraoperative visibility, sensitivity and control be simply the best; than the implants are easier placed in the prosthetic axis.

Implant surface topographies analysed using fractal dimension (Df)

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Aim. The aim of this study was to assess the fractal dimension (Df) of disks with 3 different surface topographies in order to evaluate whether Df could have a role in measuring the roughness of implant surfaces.

Methods. Thirty disk-shaped samples with 3 different surface topographies (Dental Tech, Misinto, Italy) were analyzed by scanning electron microscopy: group A: machined surface; group B: titanium plasma-spray (TPS) surface; group C: acid-etched and sandblasted (BWS) surface.

Results. The Sa (amplitude roughness parameter) of the machined surfaces was 0.6 μm , while the Sdr (developed surface area ratio) was 14%; for the TPS surfaces the values were, respectively, 5.3 μm and 97%, and for the BWS were 1.5 μm and 63%. Images at 1.000, 20.000 and 50.000 magnifications were processed for quantitative analysis of Df using the box-counting method. At 1.000 X, Df for group A, B and C was 1.86, 1.80, 1.81, respectively; at 20.000 X, Df for group A, B and C were 1.85, 1.71, 1.58, respectively; at 50.000 X, Df were 1.83, 1.61, and 1.51 for A, B and C groups. Statistically significant differences were found for Df values.

Conclusions. Df provides not only an index of roughness size values, but also a measure of roughness spatial organization; therefore, it could be a promising method to differentiate between rough surfaces capable of supporting osseointegration.

In vitro analysis with human bone marrow stem cells on titanium disks with different surface topographies for dental implants application

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Aim. Nowadays, research on dental implants is focused on surface topography, which is very important to osseointegration. The aim of this study was to assess how surface topography can induce osteoblast differentiation in mesenchymal stem cells by analyzing the expression levels of bone related genes and mesenchymal stem cells marker.

Methods. Thirty disk-shaped, commercially pure Grade 2 titanium samples with 3 different surface topographies (DENTSPLY-Friadent GmbH, Mannheim, Germany) were used: 10 Ti machined disks (control), 10 Ti sandblasted and acid etched disks (DPS) and 10 sandblasted and acid etched disks at high temperature (Plus). Samples were processed for real time Reverse Transcription-Polymerase Chain Reaction (RT-PCR) analysis.

Results. By comparing machined disks and Plus disks quantitative real-time RT-PCR showed a significant reduction of the bone related genes osteocalcin (BGLAP) and osteoblast transcriptional factor (RUNX2). The comparison between sandblasted and Plus disks showed a slight induction of all the genes examined; only the expression of BGLAP remained stable.

Conclusions. The data demonstrated that implant surface topography affects osteoblast gene expression.

Influence of abutment material on fracture strength and failure modes of abutment-fixture assemblies when loaded in a bio-faithful simulation

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Aim. Aim of the present study was to evaluate differences in the ultimate fracture resistance of Titanium and Zirconia abutments.

Methods. 20 titanium fixtures were embedded in 20 resin Mandible Section Simulators (MSS) to mimic osseointegrated implants in the premolar area. The embedded implants were then randomly divided in two groups, afterwards specimens in group A (n=10) were connected to titanium abutments (TiDesign™ 3.5/4.0, Ø 5.5, 1.5 mm, Astra Tech Dental, Mölndal, Sweden) while specimens in group B (n=10) were connected to zirconia abutments (ZirDesign™ 3.5/4.0, Ø 5.5, 1.5 mm, Astra Tech Dental, Mölndal, Sweden). Both groups were loaded to failure in a dynamometric testing machine. Fractured samples were then analysed by Scanning Electron Microscopy.

Results. Group A showed a significantly higher fracture strength than that observed in group B. Group A failures were observed at the screw that connects the abutment with the implant while the abutment connection hexagons were plastically bent by the applied load. Group B failures were a result of abutment fractures. SEM analysis showed that in group A the screw failure was driven by crack nucleation, coalescence and propagation. While in group B the SEM analysis of failed surfaces showed the conchoidal fracture profile characteristic of brittle materials.

Conclusions. Both tested system can bear physiologic occlusal loads in the canine area. However zirconia abutments can fail under levels of loading that in the literature are documented as possible during unphysiologic unilateral clenching behavior.

Instrumental evaluation of stability of emergent implants under immediate occlusal load: a prospective study

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Aim. Aim of the study is the evaluation of efficacy of implant external solidarization using a abutment splinting system by intra-oral welding of a titanium bar.

Methods. A group of 17 persons (9 women and 8 men, mean age 55,2) with presented edentulous areas in the maxilla (39 implants) and mandibula (52 implants), received a total number of 91 implants. Multiple monophasic (1p1s) endosseous emergent implants (AB Dental Devices®) were used for this study; a mean of 5 implants were inserted for each person. Antibiotics were given to the patients in the form of Azitromicine 500 mg once per day for 3 days starting 12 hours before surgery. After surgery, ice pack was placed and Nimesulide 100 mg every 8 hours for 3 days was given, together with chlorhexidine 0,2 % three times per day for 7 days as maintainance. Immediately after insertion, the abutment, was welded to a titanium bar (thickness 1,2 mm) using an intraoral welding unit, in lingual position, trying to preserve the passivity of the bar. Measuring was achieved using Periotest® (Medizintechnik Gulden) which calculates the contact interval between implants and the probe, by beating, 16 times in 10 seconds, the implants with a 8 Ncm force. This leads to a scalar quantitative analysis. The probing method has been standardized as follows: each implant has been tested positioning the patient's occlusal plane parallel to the floor and the Periotest probe with a 90° angle in respect to the long axis of the abutment. Measurements have been collected by the same operator in four (4) specific times: T0 – immediately after surgery without the titanium bar split; T1 – soon after welding the titanium bar; T2 – 4 weeks after surgery; T3 – 12 weeks after surgery at removal time of the bar.

Results. Negative values of Periotest Probing were considered success signs, besides the well known clinical and radiographic requirements. The implants at T3 which showed negative values were 89 with a success ratio of 98,9%. Moreover taking the Periotest T0 value as reference point and assuming that the more negative is the value the better is the stability, 46,4% show an improvement of stability at T3; 3,6% show no variation and 32,76% show a light decrease. But very important was that from T0 to T1 the variation of stability was positive (i.e. increased) for 51,8% of implants, remained unchanged in 2,7% and decreased in 28,2%. Little changes were seen among T1 and T2 and among T2 and T3 according to the little variations occurred in the percentages.

Conclusions. External implant stabilization by intraoral welding of titanium bars is a technique which allows to maintain implant stability during healing time until osteointegration occurs.

La riabilitazione delle edentulie distali superiori del mascellare atrofico: alternative terapeutiche al “Grande rialzo” a del seno mascellare. Revisione della letteratura.

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Il limitato spessore osseo in senso verticale dei settori mascellari posteriori dovuto ai danni causati dalla malattia parodontale e/o alla pneumatizzazione del seno mascellare rende particolarmente difficoltoso l'uso di protesi a supporto implantare. L'elevazione del seno mascellare è un metodo per risolvere questo problema ma non è l'unica soluzione e non è sempre attuabile per problemi loco-regionali e/o sistemici. Lo scopo di questo studio è di valutare l'impiego di impianti corti, impianti posizionati negli alveoli postestrattivi dei molari e degli impianti inseriti nella regione della tuberosità (solitamente osso tipo D4 della classificazione secondo Zarb e Lekholm) come alternativa terapeutica all'intervento di “Grande rialzo” del seno mascellare. I risultati, estrapolabili dalla letteratura, relativi alla sopravvivenza implantare dimostrano che tali alternative terapeutiche descritte permettono di evitare interventi di “Grande rialzo” del seno senza rinunciare ad un'elevata percentuale di successo. Parole chiave Impianti corti, Postestrattivi immediati, Tuberosità, osso D4, rialzo del seno mascellare.

Laser processing on the implant surfaces: evaluation of in vitro responsiveness of osteoblast-like cells

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Aim. The processing of titanium surfaces with laser allows to create a regular geometry with defined porosity. The aim of the study was to evaluate the viability and proliferative response in vitro of osteoblast-like cells placed on titanium with different roughness.

Methods. Osteoblasts were obtained from volunteers seized at the Dentistry and Oral Surgery Unit for tooth extraction. The isolated cells from the bone were joined up 4 titanium surfaces placed in culture plates: sandblasted surface (SBT), pore size of 5 μ m, 10 μ m and 20 μ m. A without titanium plate was used as control. The morphology, viability and cell proliferation after stimulation with growth factors for 48 hours was evaluated.

Results. All the studied area showed adhesion of osteoblast-like cells. However, the cells appear more numerous on the surface of 20 μ m. Surfaces with roughness default showed higher levels of cell viability compared to the SBT surface ($p < 0.01$). In terms of proliferation, there are no differences, however, the surface with a roughness of 10 μ m and 20 μ m appear to increase cell proliferation.

Conclusions. The surface of titanium laser shows to promote the viability and proliferation of cells. The surface with a 20 μ m pore size appears to increase the response of these cells.

Local Accidents in Dental Implant Surgery: Prevention and Treatment

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The aim of this paper is to consider local accidents that can occur during standard surgery for oral implant insertion. Accidents, as adverse events occurring during surgical session, may involve any anatomic structure of the oral cavity, including hard and soft tissues, vessels, nerve trunks, or teeth. These events have different causes, ranging from improper surgical planning to the existence of predisposing anatomic factors, the use of inappropriate instruments, or technical errors during surgery. Accidents arising during implant surgery may seriously jeopardize the outcome of an implant-supported rehabilitation. Hence, the prevention of accidents should be a priority for the surgeon. Careful clinical and radiographic examination of each patient, accurate planning of procedures, the use of proper surgical techniques and appropriate instruments are essential and all contribute to prevent such events.

Local Complications in Dental Implant Surgery: Prevention and Treatment

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There is strong evidence for the effectiveness and predictability of implant therapy in the rehabilitation of edentulism. Nevertheless, oral implant surgery can sometimes involve pathological conditions that may occur with different timing in relation to surgical session. Early-onset or late complications can be regarded as the adverse events that occur in the immediate postoperative period, or during the osseointegration. The factors responsible for early complications can be classified as excessive surgical trauma, overheating of the implant site, or bacterial contamination of the site. This group includes infection, edema, ecchymose and hematoma, emphysema, bleeding, flap dehiscence and sensory disorders. Late complications can be the consequence of adverse events occurring during implant surgery or wound healing stage and involving implant or periimplant tissues. Perforations of the mucoperiosteum, maxillary sinusitis, mandibular fracture, failed osseointegration, bony defects and periapical implant lesions can be included in this group. The prevention of complications is a primary objective for the surgeon, because these adverse events can impair the outcome of the treatment plan. Careful clinical and radiographic evaluation of the case, a proper surgical planning, a correct surgical technique with suitable instruments, fitting management of wound healing and osseointegration periods contribute to prevent or reduce these events increasing the predictability of the treatment plan.

M.I.D. Atlas: a new systematic for the stabilization of removable prosthesis

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Aim. M.I.D. (mini dental implants) Atlas endosseous implants are single-phase titanium alloy Grade 5 with variable diameter (1,8-2,2-2,4 mm), so that they can be used even in severe bone atrophies. The entry is performed in the interforaminale area with flapless technique. The main indication is the stabilization of lower overdentures, very unstable due to various factors such as movements of the tongue and transverse and vertical bone atrophy in the presence of D1 or D2 bone density. M.I.D. for overdenture can be of two types: mini implants with metal ring with a Teflon cap to be fixed in the prosthesis and mini-implants with a ball held in a soft silicone (Tuf-Link) positioned in the undercut run directly in removable dentures (Atlas, Dentatus). Case report: Male patient, aged 56, carrier of lower total dentures has a severe mandibular bone atrophy with excessive instability of the prosthesis. After careful clinical and radiographic assessment, we proceeded to the insertion of Atlas 4 MID 2.4 mm in diameter with flapless technique. The excellent primary stability has allowed the immediate loading of implants by applying the silicone retentive "Tuf-Link" in removal denture. Control at 12 months shows the stability of the prosthesis, the successful osteointegration and the integrity of implants due to the careful management of occlusal loads.

Conclusions. Implant System Atlas Implant System has proven to be a microinvasive, atraumatic, reliable and highly predictable

Maxillary rehabilitation according to the 'all-on-six' immediate implant loading, by using flapless computer-guided implant surgery. A case report

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Aim. to describe a case of complete rehabilitation of the upper jaw by means of six implants and an acrylic resin provisional fixed partial denture with immediate loading, by using the Nobel-guide® software.

Methods. An insertion with a flapless technique under local anesthesia and conscious sedation was planned according to a 3D model obtained from a double CT scan procedure, by preparing a surgical mask. A careful study of the case allowed the preparation in advance, by the prosthodontic lab, of an acrylic resin fixed partial denture which was applied with minimal adjustments, at the end of the operation.

Results. The utilization of the Nobel-guide® procedure made it possible to rehabilitate a whole edentulous arch in a short time and with minimal inconvenience to the patient.

Conclusions. The Nobel-guide® procedure, through the precise simulation, on a virtual model, of the implants axis and depth of insertion, allows the preparation in advance of a provisional fixed partial denture, sufficiently precise to make possible the immediate loading of the implants. In this way a complete rehabilitation of edentulous arches in a short time, with good aesthetic and functional results, and minimal discomfort for the patient.

Medical-Legal implications of the choice of the implant methodology

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Aim. The choice of implant methodology includes aspects that do not only relate to the application of the technology itself, but also to the prudence and diligence of the choices made by the health provider. This paper aims at focusing the attention of the practitioner on the possible risks associated with the choice of implant systems that are not sufficiently tested from the clinical and experimental standpoints.

Methods. Through the analysis of scientific literature, national and international clinical trials were made of the most popular implant systems, taking into consideration their number and scientific validity. The data obtained were then contextualized from a medical-legal standpoint in order to provide guidance in terms of validity and reliability in relation to possible issues of Medical Professional Liability.

Results and conclusions. The wide use of implant surgery for oral rehabilitation in recent decades has led to an expansion of the commercial production of implant devices. Based on the expansion of the market there are now many new manufacturers of low and unproven scientific experience, which pursue a purely commercial intent. These manufacturers in recent times, have suffered financial ups and downs, with the result that some of them have already gone bankrupt thus withdrawing from the market. This has determined, therefore, a further issue related to the unavailability of their components. In parallel, such commercial development, in order to differentiate a manufacturer from another, has led to a policy of forced "characterization" of the products, with the result that very different, and sometimes fanciful solutions have been proposed, without adequate experimental studies and clinical support. At present clinical scientific studies are randomized and validated only for a dozen manufacturers regarding the morphology and type of implant surface as well as the components and the crestal module, at least having been validated by more than one author (Jorkstadt A. "Osseointegration and Dental Implants" Wiley-Blackwell, 2009). Such different clinical and experimental quality level is inevitably reflected in the implant success rate with very different results between different manufacturers. On the other hand the commercial interest of the manufacturers themselves, in the absence of detailed rules in this regard, makes much more attractive to carry out a comprehensive marketing operation rather than lengthy and costly clinical trials, often ignored and not considered by the specialist in the field. Under these circumstances, the medical-legal implications for the health provider in the choice of the method and implant manufacturer are quite important. For this purpose, in fact, if we consider the "complication" as the expression of a "predictable but not otherwise preventable" negative evolution of a given therapy as opposed to the medical "error", defined as a negative evolution "foreseeable and preventable" it becomes clear that the choice of an implant line of products not adequately tested by clinical trials becomes, in the case of failure, a reason to find a professional liability for failure to comply with the due "prudence and diligence" on the part of the health provider.

“MG-63 cells behaviour on the new laser implant surface: a comparative study”

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Aim. The primary oral implant stability and its long-term survival depend on different factors. The early stability is influenced by bone-implant connection, but many studies also prove that long-term stability is guaranteed by specific implant surface requirements. The aim of the present study was to evaluate in vitro the biological behavior of MG-63 cells, cultivated on titanium disks simulating the main implant surfaces commercially available, especially on the new laser surface (Synthegra®) with geometrically placed spots. The aim of the study is to find the best correlation between biological response and different implant surfaces.

Methods. Osteoblast-like cells MG-63 from human osteosarcoma; 4 titanium disks simulating machined, sandblasted and 3 laser surfaces; MTT assay for evaluate cells proliferation; CV (cristal-violet) to study the cells adhesion and number.

Results. MG-63 cells have a caotic disposition on the main surfaces, as a low adhesion and low expression of E-Cadherin; these cells have a more methodical disposition, more adhesion and osteoblast-like differentiation (as expression of E-cadherin) on laser surfaces.

Conclusions. Implant surfaces laser, like Synthegra® by Geass, represent a more permissive topography to favourite MG-63 cells adhesion, growth and proliferation in vitro, despite the main other implant surfaces. This is the most desirable event for implant osteointegration in vivo.

Microbiological profile and tissue health in different implant-abutment connections

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Aim. This study evaluated the microbiota associated with different implant-abutment connections and their influence on peri-implant tissues.

Methods. A prospective randomized double blind split-mouth clinical trial was designed. 10 patients with partial edentulism in 2 different quadrants, were enrolled. One edentulous area was rehabilitated with fixed partial dentures (FPD) supported by non-submerged internal hex connection (IHC) implants, the other with FPD supported by non-submerged implants with a combined locking taper/internal hex connection (CLTIHC). Sealed envelopes with randomization codes were opened at the surgery time. Real-time PCR evaluation (RT PCR) inside the implant connection was made 3 months after surgery. Moreover, bleeding on probing (BoP) and probing pocket depth (PPD) were assessed and standardized periapical radiographs were taken. All these procedures were repeated 2 months after the final restorations.

Results. No drop-out was observed. No implant was lost. 2 months after the final restorations, the tissues around the CLTIHC implants showed significant lower bacterial counts without most of the main pathogens. All the implants showed average PPD ≤ 4 mm. 2 months after the final restoration, no significant differences were observed regarding the bone remodeling process.

Conclusions. Within the limits of this study the Authors can state that CLTIHC implants provide a better hermetic seal in regard to bacterial invasion when compared to other implants.

Numerical data of mandibular bone changes after dental implant placement. FEM and VON mises analyses

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Aim. The implantation of an external device inside the human body could be associated to a group of several changes. Several parameters are related to the type and entity of those changes. Material biocompatibility, biomechanical features of the host, wear and tear of the used material and host reactivity are some of those conditions. Dental implant osteointegration and clinical success are influenced by the combination of two different structures like "bone" and "titanium". Bone is characterized by a complex structure in a dynamic status of uninterrupted remodelling; Titanium of dental implant is chemically stressed by the surrounding bone and mechanically stressed by the masticatory load.

Methods. Considering the integration of those two components like an engineering system, it is impossible to obtain the unlimited integration based on time. This happens because dental implant, when positioned, cannot follow the bone changing and remodelling. The research in this field was performed in order to reduce the masticatory load on the dental implants and at the same time several investigations about the dental implant surface have been made.

Results. Aim of this study is to underline the possible modification on the bone surface after dental implant positioning by a FEM and Von Mises analyses. The difference between the stress and load distribution on cemented retained and screw retained prosthesis has been analyzed.

Conclusions. The results of this investigation could be useful helping the surgeons and clinicians in the planning of the dental implant-prosthetic rehabilitation in order to favour a long term clinical success.

“One to one” immediate-load implant prosthetic rehabilitation: a case report

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Aim. Immediate loading is a prosthetic protocol which allows, once the implants have been inserted, to place the temporary implant right away or within 24-72 hours from surgery. “One to one” immediate loading is an implantology which is perfectly balanced between the edentulous width and the number of implants inserted. The aim of the present work is to show the functional and aesthetic advantages, in terms of optimal distribution of the occlusal loads and of the “one to one” immediate-load protocol.

Methods. The clinical case is a 54-year-old male patient who has been carrying a mobile prosthesis for years. At first, 6 implants (self-tapping with deep spirals and wrinkled surface) were inserted to fill the gaps of the mobile prosthesis. Then, we performed a crestal sinus lift and 5 implant insertions to restore the normal occlusion. In the immediate postoperative period of the first 6 implants, which had an excellent primary stability, we placed a temporary prosthesis acting as a surgical guide; the case was finished by zirconia-ceramic single crowns.

Results. X-ray examination after 6 months revealed good implant stability, without healing defects and bone dehiscence and with an excellent morphology of peri-implant soft tissues.

Conclusions. The choice of immediate loading has an aesthetic advantage, because allows for an immediate resolution of edentulism and an excellent mucogingival aspect, and a functional advantage, because adequate loads in the immediate postsurgical period lead to osseointegration; “one to one” protocols allow to transfers the occlusal load on every implant pillar connected, with a reduced risk of overload and implant loss, and to achieve an appearance similar to natural teeth and an easier oral hygiene.

Oral bisphosphonates and dental implants, a perspective study: early results

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Aim. To determine whether osteoporotic patients with a history of oral bisphosphonate use (> 5 years) are at greater risk for implant failure or osteonecrosis of the jaw (ONJ).

Methods. 44 dental implants (33 maxillary, 11 mandibular) were placed in 12 osteoporotic patients (10 females, 2 males) with no co-morbidities, between January and March 2009, following a strict protocol, specifically made for this kind of patients.

Results. After a 20-month follow-up, ONJ and implant failure were not observed consequent to implant placement in any of the oral bisphosphonate users.

Conclusions. Early results seem to confirm safety of dental implant therapy in oral bisphosphonate users. However, longer follow-up and more cases are needed to confirm these early observations.

Osseoperception: a clinical study on 24 patients

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Aim. Between 1950 and 1960, Branemark established that bone is a dynamic living tissue. The importance of nervous fibers accompanying the bone vessels was recognized only 10 years later. These fibers, among other things, release neuropeptides like CGRP and s(P), which orchestrate bone remodeling processes and influence the activity of the immune system. "Osseoperception" is a recent term indicating any physical sensation interpreted in the light of experience. It allows to increase feedback control of implant prostheses, compared with mucosa-supported prostheses.

Methods. We selected 24 patients with mucosa-supported total prosthesis for more than 5 years. Patients were asked to report on a Visual Analogue Scale (VAS) their everyday perception of the interposition of foreign bodies like food between the arches. Then, patient rehabilitation was performed through Toronto prostheses. Other VAS measurements were taken 3, 6, 12 months after placement of the definitive prosthesis.

Results. Patients with mucosa-supported total prosthesis had a statistically-significant lower average perception of foreign bodies between the arches than patients with implant prostheses. Their perception tends to increase after 3 months, and reaches the peak on the twelfth month.

Conclusions. Osseoperception is often disregarded, but its importance is crucial. It should be numbered among the main advantages of implant prostheses, in comparison with mucosa-supported prostheses.

Osteogenic properties of dental implants evaluated by cDNA microarrays

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Aim. Different dental implants are available as they are characterised by various titanium surfaces aimed at improving osseointegration. The present study is aimed at applying cDNA microarray analysis in vitro as a tool for establishing and comparing the osteogenic properties of dental implants with different surface characteristics.

Methods. Saos-2 osteoblasts were cultured in vitro in bottom-cone tubes in the presence of 5 different dental implants with various surface characteristics (Tapered Internal, BioHorizons; Nanotite, Biomet 3i; Full Osseotite, Biomet 3i; SLActive, Straumann; SwissPlus, Zimmer). Cells adhering to dental implants were detached and RNA purified. The expression of 18,401 genes was tested by cDNA microarray.

Results. The number and viability of cells adhering to different dental implants varied but without any significant statistical difference. Conversely, gene expression was revealed to be a more sensitive biomarker being different in cells adhering to different implants. The 5 dental implants significantly modulated the expression of 15 osteogenic activities mainly including bone morphogenetic proteins, osteomodulin, and osteoprotegerin. Tapered Internal and Nanotite implants showed the most potent osteogenic activities.

Conclusions. Although no significant differences were found in in vitro cell number and viability, cells adhering to 5 differently surfaced implants showed different gene expression profiles.

Osteotome Sinus Floor Elevation and Simultaneous Single Non-Submerged Implant Placement: Case series

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Aim. is to present a 11 cases using the sinus floor elevation technique for placement of a non-submerged implant with 12 months follow-up after permanent restoration.

Methods. Eleven consecutive patients (eight men and three women) aged between 36 and 51 years (mean 42 years) with a single edentule in the area of tooth 16 or 26 were enrolled in this study. The patients had an unremarkable medical history and no history of sinus disease. Preliminary clinical and radiographic (panoramic X-ray and periapical radiographs) showed mean residual bone. Radiographic evaluation of the area revealed nearly 3-5 mm of alveolar bone height. The osteotomy site was gradually widened with the number 3 osteotome. When the final osteotome (number 4) was used, bone graft material (Endobon® Xenograft Granules, Biomet 3i, Palm Beach Gardens, FL.) was added at the concave tip. A simultaneous single implant 4X10mm was placement (Osseotite, Biomet 3i, Palm Beach Gardens, FL). The implant was evaluated after 3, 6, and 12 months of loading and was judged to be successful.

Results. The probing depth was mean $3\pm 0,7$ mm at all sites around 10 implants, there was no bleeding upon probing or mobility, and the fixtures appeared radiographically normal. One implant was removed after 2 months for mobility.

Conclusions. Controlled prospective clinical studies are needed to evaluate the long-term outcome and various surgical modifications of OSFE.

Perspective evaluation of dental implants shifting: osseointegrated vs immediately loaded implants

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Aim. The aim of the present research is to evaluate if a shift in dental implants' position takes place during a four months period, in case of osseointegrated implants and in case of immediately loaded implants.

Methods. Thirty-nine patients were selected and treated with fixed full-arch dentures supported by 4-6 immediately loaded implants. Twenty-nine patients were included in the test group. In this case implant shifting was evaluated comparing plaster impressions taken at the moment of implant placement and then at 4 months post implant insertion. In the control group (10 patients) the plaster impressions evaluated were taken at 4 months and then at 8 months post implant insertion. Plaster casts were realized incorporating implants' analogues. Special devices were screwed on the analogues. Plaster casts were evaluated by 3D scanner laser and special software measured the possible implant shifting between the two casts for each patient. Only differences > 75 μm were taken into consideration. Statistical analysis was performed by logistic regression and chi-square test.

Results. There were no drop-outs and one implant only failed in the test group (total: 195 implants evaluated). In the test group 34.5% of the implants (50 out of 145 implants) showed a discrepancy > 75 μm . 19 implants showed differences of 76 μm -100 μm ; 15 implants 101 μm -125 μm ; 8 implants 126 μm -150 μm ; 4 implants 151 μm -200 μm ; 1 implant 201 μm -300 μm ; 3 implants 301 μm -400 μm ; 1 implant 401 μm -600 μm . In the control group 28% of the implants (14 out of 50 implants) showed a discrepancy > 75 μm . 9 implants showed differences of 76 μm -100 μm ; 3 implants 101 μm -125 μm ; 2 implants 151 μm -200 μm . Considering only displacements > 100 μm the test group showed a four times greater probability to present implant shifting than the control group (OR = 3.8; P = 0.08). No significant differences were found between the upper and lower arch while a greater number of shifted implants were found in post-extraction sites compared to healed sites.

Conclusions. During the first 4months of healing a shifting of implant position can take place in immediately loading protocols, with a greater incidence when implants are placed in post-extraction sites.

Piezoelectric bone surgery: bone atrophy and differential implant site preparation

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Aim. Rehabilitate maxillary and mandibular bone atrophy with surgical techniques featuring with excellent precision, sensitivity and intra-operative control, so that the implant site preparation results into the thicker cortical bone and that the healing results faster, with a more careful and easier modelling of bone graft if necessary. MATERIALS AND

Methods. We used Piezosurgery® technique in 20 cases of partial edentulism with vertical and/or horizontal bone atrophy: 10 cases of bone graft and 10 cases of ridge expansion. For the implant site preparation we used the inserts IM1, IM2P, IM2A, OT4, IM3P, IM3A. The OT7 resulted useful for the ridge expansion; the bone stimulation were obtained with the IM1 insert. The bone graft (autologous and eterologous) were cut with OT7, OT8R/L inserts and modelled with OP3. Biomaterial (GenOss) was protected with PRF membrane (fibrin riched plasma).

Results and Conclusions. With piezoelectric bone surgery we obtain: - selective cut - micrometric cutting action for maximum surgical precision and intra-operative sensitivity - high visibility due to cavitation effect - easy management of bone graft - high primary stability in the implant sites prepared with Piezosurgery® - buccal thin cortical bone preservation due to differential implant site preparation In horizontal atrophy the piezoelectric bone surgery allow to do conservative ridge expansions, with high cutting precision and safer intra-opertive control.

Porcine Bone Used in Sinus Augmentation Procedures: A 5-Year Retrospective Clinical Evaluation

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Aim. Rehabilitation of the edentulous posterior maxilla with dental implants often represents a clinical challenge because of the insufficient bone volume resulting from pneumatization of the maxillary sinus and crestal bone resorption. The aim of this study was a retrospective clinical evaluation of maxillary sinus augmentation using porcine bone.

Methods. One hundred twenty-one healthy patients with a noncontributory medical history were included in this study. All patients underwent sinus augmentation procedures with porcine bone. After a 4- to 6-month healing period, sandblasted and acid-etched implants were inserted.

Results. All grafted sinuses healed without major complications, except for 2 that showed no regeneration at the time of implant placement. A total of 21 implants were lost, 8 after the second-stage surgery and 13 in the 5 years' follow-up after loading. The cumulative survival rate was 92% after a mean loading time of 5 years. Only minor peri-implant marginal bone resorption was found.

Conclusions. Within the limitations of this study, porcine bone can be used with success in sinus augmentation procedures, and rougher-surfaced implants are probably preferable.

Predictability of post-extraction immediate load implants: use of standardized clinical protocols

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Aim. The aim of this study is to propose standard protocols which can increase the predictability and success of post-extraction immediate load implants.

Methods. The study included 80 patients with an average age of 53.3 years. 82 teeth were extracted, all in aesthetic zone, and an equal number of implants TMI[®], with different diameter and length according to the tooth to be replaced. All implants were restored with provisional crown in the same session of the extraction. Particular attention was paid to patient selection, to choice of site to be treated and to the implementation of standardized protocols: pharmacological, surgical and prosthetic.

Results. At the end of this first experimental phase (36 months) there have not been failures with a survival rate 100% and a success rate 97%, according to the criteria of success of Albrektsson and Zarb.

Conclusions. The post-extraction immediate load implant is a valid therapeutic alternative which guarantees optimal functional and aesthetic results but it has significant clinical difficulties so it is very important to plan carefully the treatment. Careful patient screening and careful assessment of the site to be treated, the adoption of a standardized protocol, both for the intervention both as regards the choice of materials most appropriate, and operator experience are crucial for the success of this implant-prosthetic therapy.

Prosthetic rehabilitation of the atrophic maxilla: therapeutic strategies

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Maxilla bone atrophy secondary to tooth loss, traumatic results or resection, frequently compromises traditional or implant-anchored prosthetic rehabilitation. Regeneration of bone defects aims at re-establishing the original skeletal contour and function. The use of implant-supported bridges in reconstructive jaw surgery frequently requires an integration of bone grafts into existing bone, and implant integration into bone constitute complex healing events that all need to proceed in an orderly, regulated manner in order to achieve a clinically acceptable outcome. The goals of surgical prosthetic reconstruction of the totally edentulous maxilla with bone grafts and dental implant are to enable placement and integration of dental implants, to rebuild a normal facial morphology, to restore oral circumferential soft tissue support and to bring about good aesthetics, phonetics and function. Alternative implant supported rehabilitations, such as all-on-4, V-to-V implant positioning and double zygomatic implants can be provided in elderly, systemically compromised patients and smokers.

Reconstruction of peri-implant bone defects using Rh PDGF-BB: Review

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Aim. Review of scientific literature from 2005 to 2011 about osseointegration of implant placement in areas where there are peri-implant bone defects using Rh PDGF-BB.

Methods. We analyzed 40 articles, searches on PubMed. Studies show the use of platelet derived growth factor (PDGF-BB Rh), a resorbable collagen membranes and grafting materials inserted into the peri-implant bone defects greater than 2 mm. All studies show histological, radiological and clinical follow-up ranging from 6 weeks to 6 months.

Results. All cases studied showed a significant increase in bone and a substantial radiographic change consisting of increased radiopacity and bone trabeculation, indicative of increased mineralization and maturation of the bone.

Conclusions. The literature review allowed us to understand the importance of bioengineering in the clinical practice of dentistry. We young researchers and clinicians are interested in developing a technique for processing these defects that is less invasive as possible so that the patient accepts it and get a successful outcome.

Relationship between skeletal and jaw bone density in patients receiving dental implants

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Aim. Considering the incidence of edentulism in elderly subjects and the increasing prevalence of osteoporosis, it's fundamental understand the effect of systemic bone mass loss on jaw bones and on the healing process of dental implants. Present study was performed to analyze the relationship between jaw bone density with BMD of skeletal sites and to estimate the process of osseointegration in osteoporotic patients receiving dental implants.

Methods. In osteoporotic patients mandibular bone quantity has been evaluated by classifying mandibular inferior cortical and trabecular bone on panoramic dental radiographs, densitometric analysis on digital periapical radiographs and histomorphometric analysis of mandibular bone biopsy.

Results. Tooth loss, decreased of clinical attachment level and decreased periapical radiograph density were associated with low skeletal BMD. Mandibular inferior cortical shape on dental panoramic radiographs could be related to spine BMD and due to an increase in bone turnover. Patients with cortex erosion were characterized by lower femoral neck BMD, however without statistically significant correlation. As regards histomorphometric bone formation and resorption indices, no differences were appreciated between osteoporotic patients and healthy subjects.

Conclusions. Although relationship between low femoral neck density and mandibular bone quality was observed, the bone density of the skeletal sites may not be used to predict jaws BMD.

Removal of a migrated dental implant from the maxillary sinus 7 years: a case report

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The accidental displacement of dental implants into the maxillary sinus is a infrequent but possible complication in dental clinical practice. The main cause of implant displacement is the inadequate bone height in the posterior maxilla. This event usually occurs during surgery and it is more rarely reported in the post-operative period, especially with long-term follow-ups. Here a case of an implant migrated inside the maxillary sinus at the time of abutment connection and removed 7 years later is described. Postoperative recovery was uneventful. To the authors best knowledge, this case represents the first report concerning migration of an oral implant into the maxillary sinus removed after 7 years.

Short implants VS longer implants long-term survival rates in prosthetic rehabilitation of atrophied jaws

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Aim. Implant prostheses are often used to restore partially or completely edentulous patients, but limited bone height, especially in the posterior mandible, may restrict the use of dental implants. Short implants may be selected in these situations : it is possible to reduce the need for sophisticated and expensive surgical procedures like sinus lift, bone grafting and mandibular nerve transposition, it is possible to place short-span dentures and it is possible to avoid cantilevers in the posterior regions. The purpose of this study was to test the hypothesis that short implants in prosthetic rehabilitation of atrophied jaws might give similar long-term implant survival rates as longer implants used in larger bone volumes.

Methods. From March 2009 to June 2010, a 14 healthy patients (9 women and 5 men, age range 45–68 years) were included in this study. A total of 42 titanium plasma-spray implants 4,5 X 6 mm (Bone System, Milano, Italy) were inserted in atrophic mandible.

Results. This study included 42 implants placed in 14 patients. The overall survival rate of implants placed by was 95,24%.

Conclusions. Short implants are used in case of reduced bone height as they avoid the need for additional surgical procedures for bone augmentation or mandibular nerve transposition. In conclusion the short implant can be a solution in cases of limited bone height.

Short porous implants in the rehabilitation of maxilla: a three-year report of a prospective study

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Aim. The aim of this study was to determine, after 3 years of prosthetic loading, the reliability of short and ultrashort sintered porous surface conical shaped implants placed in the maxilla.

Methods. During the study 156 implants were inserted in 60 patients aged 30 to 70 years, ranging from 3.5 to 5 mm in diameter and between 5 and 9 mm in length. The cumulative survival rate(CSR), the crown to implant ratio and the months of prosthetic loading were then evaluated.

Results. After 36 ± 3.12 months of loading the CSR amounted to 98.7% in the case of implants inserted in at least 5 mm bone edges and to 87% in the case of indirect sinus elevation (Summer technique).

Conclusions. Analysis of the results showed that implants varying in length from 7 to 9 mm with or without indirect sinus elevation is a valid therapeutic option in the maxilla rehabilitation. In bone edges of at least 5 mm in height the use of 5x5 implants without indirect sinus elevation, seems to represent a viable alternative to maxillary sinus lift techniques. Despite encouraging results in the edges of less than 5 mm in height, the use of 5x5 implants in association with indirect sinus elevation may not yet be considered a reliable alternative to peri-implant surgery of sinus elevation.

Short porous implants in the rehabilitation of the mandible: a three-year report of a prospective study

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Aim. The purpose of this study was to assess, after an average 3 years of prosthetic loading, the reliability of short and ultrashort sintered porous surfaced conical shaped implants included in the highly atrophic mandible.

Methods. During the study 100 implants were inserted in 40 patients aged between 30 and 70 years, ranging in size from 3.5 to 5 mm in diameter and between 5 and 9 mm in length. The cumulative survival rate (CSR), the crown to implant ratio of and months of prosthetic loading were then evaluated.

Results. At the end of the observation period the CSR at a distance of 36 ± 3.12 months of loading was 97%.

Conclusions. Analysis of the results showed that the implants variable in length from 7 to 9 mm are a valid therapeutic option in the rehabilitation of edentulous mandibular edges. The use of 5x5 implants appears to represent today a viable alternative to additive peri-implants surgical maneuvers.

Simultaneous Sinus Membrane Elevation and Dental Implant Placement Without Bone Graft

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Aim. The aim of this prospective, controlled and randomized clinical study was to evaluate whether sinus membrane elevation and simultaneous placement of dental implants without autogenous bone graft can create sufficient bone support to allow implant success after 6 months post-surgically.

Methods. Sinus membrane elevation and simultaneous placement of dental implants were performed bilaterally in 15 patients in a split-mouth design. The sinuses were assigned in 2 groups: test group without graft materials and control group with intra-oral autogenous bone graft. For each implant, length of implant protruded into the sinus, resonance frequency analysis (RFA) and bone gain were recorded at baseline and 6 months follow-up.

Results. Only one implant of test group was lost, reaching a success rate of 96.4% and 100% for test and control groups, respectively. After healing, radiographic new peri-implant bone was observed in both groups ranging between 8.3+2.6mm and 7.9+3.6mm for control and test group, respectively ($p>0.05$). RFA values were lower for the control group when compared with baseline ($p<0.05$), however these values were similar at 6 months ($p>0.05$). A significant positive correlation was found between the protruded implant length/bone gain and implant survival/sinusitis ($p<0.0001$).

Conclusions. Implants placed simultaneously to sinus membrane elevation without graft material resulted in bone formation over a period of 6 months.

Size of exposure and bone volume augmentation in the reconstructive surgery with titanium mesh

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Aim. Titanium meshes are used in combination with bone grafts and/or bone substitutes in various case reports and case series. A major inconvenience of the Ti mesh technique concerns the high rate of exposure that may facilitate graft infection. The aim of this study is to evaluate if the size of exposure is correlated of the bone volume reconstructed under the titanium mesh.

Methods. This is a clinical retrospective study. A total of 15 Titanium Meshes and particulated bone graft / Bio-Oss (Geistlich Biomaterials) in a (70/30 mixture) were inserted to augment bone volume in the 12 patients. The Ti-Meshes were preplanned presurgically on a rapid prototyping model. On the CT scan were calculated the Desired bone volume augmentation under the mesh and the Real bone volume augmentation after 9 month. On the Clinical Photos was calculated the Area of Exposure.

Results. The mesh exposure occurred in 83% of the patients and 80% of the mesh inserted. The mean Time in which the mesh exposure occurred was 2,17 months. The mean Area of Exposure was 0,73 cm². The mean Desired bone volume augmentation obtained under the titanium mesh was 1,49 cm³. The mean Real bone volume augmentation obtained under the titanium mesh was 1,04 cm³. In this study the mean Real bone reconstruction obtained under the titanium mesh was 70,93 % (range 26% to 94% of the Desired bone volume augmentation).

Conclusions. There is a statistically significative correlation between the Area of Exposure of the mesh and the Real bone volume reconstructed. In fact, for every cm² of Exposure, there is a Lack of bone reconstruction under the titanium mesh, equal to 16% of the Desired bone volume [Test T di Student: p Value : 0,001(<0,05)].

Socket preservation by atraumatic extraction technique in different gingival biotypes

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Aim. During the treatment planning process, it is important to recognize differences in gingival tissue that can affect treatment outcomes. The concept that thick and thin gingival biotypes have different responses to inflammation and trauma was previously introduced. This concept is expanded in that gingival biotypes dictate different procedures for implant site preparation. With appreciation of these differences, preparatory steps can be taken to create a more ideal implant placement site.

Methods. A bibliographical review has been carried out, using Pubmed database, on the periodontal and surgical strategies that can be employed to improve the treatment outcome either by minimizing alveolar resorption or by providing a better tissue environment for implant placement.

Results. Clinical observations have led clinicians to identify two basic human periodontal forms. The more prevalent, the thick flat type, occurs in over 85% of the population; the thin scalloped type, occurs in less than 15% of cases. These biotypes are associated with different bone thickness. Thick bony plates associated with thick biotypes and thin plates with potential fenestrations and dehiscence associated with thin biotypes respond differently to extraction and have a different pattern of osseous remodeling following this procedure. Atraumatic extraction and alveolar socket preservation have the key role in following implant placement. Excessive force is likely to fracture the alveolar plate and result in bone resorption and unpredictable bone healing. This is more pronounced with the thin alveolar plate associated with thin gingival biotypes. When compromise of the alveolar plate is suspected, it is essential to utilize ridge preservation or augmentation protocols.

Conclusions. It is suggested that a careful evaluation of gingival tissue biotypes is important in treatment planning. By understanding the nature of the tissue biotype, the clinician can employ appropriate periodontal and surgical procedures to minimize alveolar resorption and provide a more favorable tissue environment for implant placement. This is especially important in thin periodontal biotypes where the thin alveolar plate is highly susceptible to remodeling.

Split-Crest: a case report

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Aim. The advances in oral surgery allowed us to compensate for the anatomical loss which arise from various diseases and which cause negative clinical conditions to implant rehabilitation. Among the pre-implant techniques there is the split crest. Through expanders, it makes rehabilitation possible when the reduced crestal width could be an obstacle. The expansion technique involves separation of the two cortical parts with prior preparation of the mucoperiosteal flap. More specifically, the flap is traced with a scalpel and then an osteotomy is performed using sharp-pointed chisels, the form of which creates joints which release force related to the mechanics of the surgery. Then, with greater osteotomes, we will create a green wood fracture which will increase the transverse diameter of the apical crestal region. Finally, the alveolus can be prepared for implant fixture insertion.

Clinical case. The clinical case is a 47 -year-old female patient with a resin mobile prosthesis, 3,5 mm bone width and 16-13 mm height, as proved by a 3D model. After flap tracing and separation of the two cortical parts of the crestal bone through expanders, six implants were inserted, and 4 were immediate-load implants. Clinical and radiographic examinations two months after loading confirm the therapeutic success.

The Bio-Col technique in a case of post-extraction implant in anterior site

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Aim. The aim of the present study is to evaluate the effectiveness of the Bio-Col technique in a case of post-extraction implant in anterior site.

Methods. The tooth 1.1 is extracted and an absorbable collagen membrane is placed in the alveolus on the vestibular wall. A fibrin sponge and bovine bone chips are plugged in and the membrane is folded up in order to close the alveolus. Finally, the site is sealed with β -cyanoacrylate to protect the graft and the membrane. An implant is placed 6 months after the extraction and a provisional prosthesis is used to condition the soft tissues before cementing the final prosthesis. Radiographs and photos are taken at baseline, during surgery, 9 and 12 months after surgery.

Results. The bone crest thickness and height are totally preserved 6 and 12 months after the extraction. Radiographs show the integrity of the bone peaks and the integration of the graft. A good soft tissues profile in the frontal and occlusal view is clinically observed. **DISCUSSION:** The Bio-Col technique allows to minimize the bone loss due to remodeling after extraction, avoiding the soft tissue collapse. Radiological and photographic results point out that this technique creates the ideal conditions for placing an implant and obtaining satisfying aesthetic results.

Conclusions. The Bio-Col protocol is a valid surgical technique to obtain implant osteointegration with good aesthetic clinical results, therefore it is highly recommended in anterior sites.

The response of bone marrow mesenchymal stem cells to oxidized nano-structured and turned titanium surfaces

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Aim. The aim of this study was to analyze the topographic features of a novel nano-structured oxidized titanium implant surface and to evaluate its effect on the response of human bone marrow mesenchymal stem cells (BM-MSC) compared to a traditional turned surface.

Methods. 10x10x1 mm turned (control) and oxidized (test) titanium samples (P.H.I. s.r.l., San Vittore Olona, Milano, Italy) were examined by scanning electron microscopy (SEM) and atomic force microscopy (AFM) and characterized by height, spatial and hybrid roughness parameters at different dimensional ranges of analysis. Primary cultures of BM-MSC were seeded on titanium samples and cell morphology, adhesion, proliferation and osteogenic differentiation, in terms of alkaline phosphatase activity, osteocalcin synthesis and extracellular matrix mineralization, were evaluated.

Results. At SEM and AFM analyses turned samples were grooved, whereas oxidized surfaces showed a more complex micro- and nano-scaled texture, with higher values of roughness parameters. Cell adhesion and osteogenic parameters were greater on oxidized ($p < 0.05$ at least) vs turned surfaces, whereas the cell proliferation rate was similar on both samples.

Conclusions. Although both control and test samples were in the range of average roughness proper of smooth surfaces, they exhibited significantly different topographic properties in terms of height, spatial and, mostly, of hybrid parameters. This different micro- and nanostructure resulted in an enhanced adhesion and differentiation of cells plated onto the oxidized surfaces.

The responses of osteoblastic cells to surface treatment on grade 4 and 5 titanium for orthodontic mini-implants

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Aim. To investigate the behaviour of osteoblast-like cells on grade 4 (G4Ti) or grade 5 titanium (G5Ti) with different surface treatment for orthodontic mini-implants.

Methods. MC3T3 cells were plated on machined, acid-etched G4Ti with or without calcium phosphate (CaP) or machined, electrochemically-treated (E.T.) or E.T.+ CaP G5Ti discs. Surface and cell morphology was analysed by SEM and immunofluorescence. Cell viability was measured by chemiluminescence at 24, 48 and 72 hours of culture. Real Time PCR for osteoblast-specific genes was performed after 3 days of culture to measure cell differentiation.

Results. Cells on machined surfaces were flat and stress fibres with vinculin labelling were visible; cells on rough surfaces had spindle and bipolar shape, with lower cytoskeletal organisation. Cell proliferation was highest on machined surfaces. Cells grew more slowly on rough G4Ti and quickly reached a plateau. Cells on G5Ti proliferated rapidly and no difference was observed after 72 hours between the groups. CaP enrichment on G4Ti significantly increased mRNA levels for alkaline phosphatase and Osteocalcin, whereas E.T. on G5Ti lowered osteoblastic gene expression as compared to smooth surfaces.

Conclusions. Rough G4Ti promoted cell adhesion, and improved in vitro osteoblast differentiation. Machined G5Ti promoted a rapid cell proliferation, abundant matrix synthesis, and induced high expression of early differentiation markers, albeit not of Osteocalcin.

Therapeutic alternatives to maxillary sinus elevation: a literature review

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Aim. Maxillary sinus elevation is considered one of the most complex surgical procedures in dental implantology. In addition to its surgical complexity, other limiting factors (relating to the implantologist's expertise) may include the global time to wait afterwards before the implants can be placed in position, the edema involved in the patient's post-operative course, a high risk of even severe complications (e.g. sinus membrane perforation, sinusitis), an implant success rate that is lower than for implants placed in native maxillary bone, and the related costs. The following types of implant, inserted without any prior bone grafting or regeneration procedures, can be considered as an alternative to maxillary sinus elevation: tilted implants, all-on-four solutions, zygomatic implants, pterygoid implants placed in the tuber, and short implants. The object of this presentation is to describe the implantological therapeutic options for avoiding sinus elevation, and the related published success rates.

Methods. This review was conducted using the Pubmed Medline search engine. The study was conducted for the period from 1997 to 2010.

Results. In all, 15 studies were selected that met our chosen search criteria. In a review conducted on tilted implants, Del Fabbro et al¹ found a success rate of 98.75%. Malo² and Puig³ performed studies on the "All-on-Four" technique (a method involving the maxillary rehabilitation relying on four implants): Malo reported a 97.6% cumulative implant success rate after a follow-up of one year, while in the Puig series it was 97.94%. Numerous studies have been conducted on the use of zygomatic implants: the first to publish an article on this issue was Branemark in 1988. Galán Gil S et al⁴ described a success rate in the range of 82-100%. Over the years, clinicians experimented with other options as an alternative to maxillary sinus elevation, including implant placement at maxillary tuber or pterygoid level. Valerón⁵ and Peñarrocha⁶ respectively fitted 152 and 68 pterygoid implants, obtaining success rates of 94.7% and 97.05%. Numerous other studies were conducted on the so-called "short" implants, and the success rates in this case ranged from 86%⁷ to 100%⁸. Discussion: maxillary sinus elevation is a very complex surgical procedure that can only be considered highly predictable an expert hands. In cases of severe atrophy of the maxilla, there are several alternatives to maxillary sinus elevation, such as the types of implant mentioned above, but some such alternative implantological solutions can pose surgical and prosthetic problems comparable with, or even worse than those relating to sinus elevation.

Conclusions. The success rate of implants relying on alternative surgical techniques appears to be acceptable when compared with the success of implants placed after sinus elevation surgery. In agreement with Att et al⁹, who conducted a review on the feasibility and clinical outcome of various fixed rehabilitation solutions for the edentulous maxilla, we conclude that - with the exception of implant inserted in native bone - not enough long-term clinical studies have been conducted as yet to enable us to say which method is associated with the highest success rate in the atrophic maxilla.

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Tilted implants result: a single cohort prospective study

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Aim. The aim of this study was to prospectively evaluate the clinical and radiographic outcomes of immediately loaded full-arch fixed prostheses supported by a combination of two axially and two non-axially positioned implants.

Methods. Two hundred and four edentulous patients were enrolled and treated for a total of 204 arches. Each jaw was restored by a full-arch fixed prosthesis according to the All-on-Four protocol. The provisional acrylic prosthesis was delivered after four hours and all cases were finalized 4 to 6 months later. Every patient was scheduled for follow-up at 6 and 12 months of function and annually up to 6 years. Bleeding on probing, plaque score and radiographic evaluation of marginal bone level were assessed at each visit.

Results. A total of 816 implants (Nobel Biocare, Göteborg, Sweden) were placed with a follow-up range of 4 to 71 months. Five axial implants failed in the maxilla and one tilted implant in the mandible, all after 6 months of loading. Implant survival rate at 1 year was 98.34% and 99.77% for the maxilla and the mandible, respectively. No difference was found in marginal bone loss between axial and tilted implants. Plaque and bleeding scores progressively improved from 6 to 12 months.

Conclusions. The encouraging results of this study suggest that the present technique can be considered a viable treatment option for the immediate rehabilitation of both mandible and maxilla.

Tissue graft in post-extractive alveolar socket healing

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Aim. In case of delayed implant insertion, the literature describes some techniques to preserve the alveolar socket remodeling. Often when the quantity of bone is not enough an epithelial-connective graft could be useful to support the alveolar sites healing. Three reasons influence the surgeon to this kind of therapy. First of all, it is statistically noticed that we achieve a major thickness of soft tissue, really important if we want use a membrane in a second surgery. For second, the tissue graft allows a right protection of the clot, which, if it reaches a high stability level in the early days, enables a good refilling of the alveolar socket, through cell migration and growth factors release. Last but not least is the soft tissue collapse, that can lead to incorrect healing and also to a thin bone measure.

Methods. In this case we use an epithelial-connective graft to replace a tooth with a fixture in an aesthetic site with a deep periodontal deficit. Throughout the extraction the graft is located in order to maintain the clot and enough quantity of soft tissue. After two months the fixture was inserted and after the osseointegration we get along with the prosthetical stage.

Results. Looking at the clinical success obtained, it is important to underline how the regenerative bone methods become easier in these cases, due to a better bone and soft tissue healing. We have to analyze other cases to get predictable and repeatable clinical statistics.

Conclusions. All this factors are necessary to guarantee an excellent healing and optimal conditions of the surgical site.

Tooth – implant connection: a preliminary study

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Aim. The aim of this study is to analyze the problems of tooth – implant connections. In the literature there is not significant number of studies and often these have different results too. Today it's not possible to define a clinic standard therapy protocol to make a prosthetics framework with tooth – implant connection.

Methods. between various type of tooth – implant connections we paid attention on rigid connection in fixed prosthesis. A clinic standard therapy protocol could open new therapeutic approach for the clinician that often must decide to save or replace a natural tooth in prosthodontics plan. However it is difficult to define a clinic standard therapy protocol because there are a lot of variables. We conducted a study with FEA method of forces and stresses and we got preliminary results.

Results. The different clinic complications highlighted in literature were principally referable to biomechanical complications. If we modify geometrics variables of FEA models, we can control the distribution of all forces.

Conclusions. A biomechanical method could give back first information about most important variables in tooth – implant connections and open the way to new studies for a real clinic standard therapy protocol.

Transcrestal maxillary sinus floor elevation with bone substitutes.

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Aim. To compare the effectiveness of 2 bone substitutes used with the Smart Lift technique.

Methods. Smart Lift Technique was randomly associated with Biostite® (Group A) or Bio-Oss® (Group B). Radiographic measurements (residual bone height, sinus lift, implant penetration, graft height) were recorded.

Results. 30 patients (15 in Group A, 15 in Group B) received 30 implants. 1 membrane perforation was detected. Group A showed significantly greater sinus lift and graft height at 6 months.

Conclusions. A greater extent of sinus lift and graft height were observed for the Biostite® group at 6 months.

Transcrestal maxillary sinus floor elevation with bone substitutes. A case series

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Aim. To evaluate effectiveness and post-operative morbidity of the Smart Lift Technique associated with bone substitutes.

Methods. Smart Lift Technique was randomly associated with 2 bone substitutes. Patient-related data and radiographic measurements (residual bone height, sinus lift, implant penetration, graft height) were recorded.

Results. 30 patients received 30 single implants. The median sinus lift was 7.15 mm and 7.10, post-operatively and at 6 months respectively. Patient pain and discomfort were limited.

Conclusions. Smart Lift Technique associated with bone substitutes seemed to be a surgical option for transcrestal sinus lift.

Valutazione clinica e microbiologica di impianti a connessione esagonale rispetto ad impianti con connessione combinata

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Obiettivo. Lo scopo del presente lavoro è quello di valutare l'ermeticità nei confronti di batteri parodonto-patogeni di impianti con connessione conica rispetto ad impianti con connessione esagonale.

Metodi. Sono stati selezionati 10 pazienti che presentavano due edentulie singole o parziali in diversi quadranti. In ciascun soggetto le due edentulie sono state riabilite con 2 diverse metodiche implantari: impianti a connessione conica (gruppo test), impianti a connessione esagonale interna (gruppo controllo). A 3 mesi dall'intervento si è proceduto alla raccolta del campione microbiologico all'interno della connessione, previa rimozione della vite di guarigione, mediante PCR-Real Time e successiva valutazione dei parametri biometrici.

Risultati. A 2 mesi dalla riabilitazione definitiva, l'analisi microbiologica dei tessuti perimplantari ha evidenziato un numero minore di conte batteriche totali ed una minor presenza di patogeni parodontali negli impianti con connessione combinata. Tutti gli impianti hanno mostrato condizioni di salute perimplantari ottimali con sondaggi ≤ 4 mm. Le RX endorali peri-apicali a 3 e 5 mesi non hanno mostrato differenze significative riguardo al rimodellamento osseo perimplantare attorno alle due sistematiche.

Conclusioni. Sulla base dei risultati microbiologici ottenuti è possibile sostenere che gli impianti con connessione combinata forniscono a livello dei tessuti perimplantari una maggiore ermeticità nei confronti dei batteri parodonto-patogeni.

MAXILLO-FACIAL SURGERY

A soft tissue simulation improvement using photogrammetry

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Recently, craniofacial surgery uses several simulation systems to study facial deformity, both in terms of diagnosis and surgical planning. Simulation systems allow surgeons to preview surgical results by virtually repositioning of bone segments and soft tissues, by 3D reconstruction from CT scan. The further improvement of technology has been the ability to overlap photogrammetry on the reconstructed and 3D-simulated soft tissues. Many authors have demonstrated the accuracy of the acquisition of images using 3D cameras. Photogrammetry allows a non-invasive and high accuracy study of the morphology of the face, enhancing the standard iconography.

Aim of this paper is to present our protocol of preoperative studying patients with dento-skeletal deformities. Up to now 15 patients underwent a cone beam CT and photogrammetry (using 3dMD) after the end of pre-surgical orthodontic treatment. Both the studies were acquired keeping the patient in the same standardized and reproducible position: Frankfort plane parallel to the floor, open eyes, lips at rest and in maximum intercuspitation jaws closed. Photography adapts to the 3D model of soft tissue, providing a realistic simulation of the surgery virtually performed. The best view of the patient's face simulation allows better planning of surgery, with particular attention both to the function and, in this way, to the aesthetics of malformed patients, facilitating a better doctor-patient dialogue with whom you can eventually share surgical planning.

Aesthetic evaluation in patients treated for lip and palatal cleft

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Aim. To evaluate static and dynamic aesthetic in patients treated for lip and palatal cleft.

Methods. Photographs and dynamic measurements of patients of the study and control group were taken. Anthropometric measurements were made and documentation has been analyzed by a committee.

Results. The survey shows a different conformation of the upper lip of the patients analyzed. In patients with cleft the most affected portion is the vermilion of the upper lip. Patients with cleft show greater asymmetry in movement, while patients with bilateral cleft show greater overall symmetry.

Conclusions. The upper lip in patients with cleft is different from the one of the control group with the same age, sex and ethnicity. Surgical correction of cleft lip not always gives a normal appearance. The cleft side is more strongly asymmetric during movement. Patients with bilateral cleft also show less asymmetry in dynamic vision.

Benefits of piezoelectric surgery in maxillofacial surgery

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Aim. Piezoelectric surgery is based on the use of ultrasonic cutting of bone. It represents an innovative technique, offering the oro-maxillo-facial surgeon the ability to make precise bone cuts without damaging the soft tissue. It minimizes the invasiveness of the surgical procedure and the possibility to work in a bloodless field. Compared with traditional methods, it allows to obtain optimal recovery and reduces the swelling and discomfort after surgery. The clinical characteristics of piezoelectric surgery can be summarized in five points: micrometric cutting, selective cutting, optimal visibility in the surgical field, reduced pressure on the handpiece, less vibration and noise. Piezoelectric surgery has been widely used in oral and maxillofacial surgery, both in adulthood and in childhood. It is extremely useful in any surgical procedure where you need to make osteoplasty and osteotomy.

Methods. Our clinical experience was conducted during 2010 where we have visited at the unit complex maxillofacial surgery about 2000 patients. 25% were pediatric patients, 55% of adult patients were male with average 40-55 years, and pediatric patients 8-12 years. About 38% of them underwent surgery. 20% of these interventions were made with piezoelectric ultrasonic instrument. 19% of these interventions was represented by the avulsion of third molars, 15% of these interventions has been represented from surgery of cystic removal, 13% of intervention disimpaction of items included, 12% of intervention avulsion of surplus items, 11% of avulsion intervention included elements other than third molars, 4% by surgery gercmectomia, 4% from the Caldwell-Luc operation for maxillary sinusitis, 4% by the intervention of Le Fort I osteotomy, 4% of sagittal mandibular osteotomy surgery, 3% from the intervention of large maxillary sinus, 3% from the intervention of split crest, 2% from surgery for odontoma, 2% from the intervention of bone harvesting from intra-site oral, 1% from surgery for ameloblastoma, 1% of intervention for exostoses, 1% of intervention osteoma, 1% by expanding palate surgery, 1% by osteotomy surgery for ankylosis TMJ. We compared the interventions with the Piezosurgery with those made with traditional tools and drills in patients with the same disease.

Results. We have been able to verify the selectivity of the cut using the Piezosurgery at frequencies between 60-100 microns. The cutting action affects only the mineralized tissues and does not affect soft tissues. That are cut with high frequencies and this has allowed us to make interventions without affecting the soft tissues adjacent to the surgical site, with a percentage of preservation of these structures to 100%. The microtome cutting has resulted in better tissue healing, improved postoperative course with a significant reduction of swelling, edema and trismus postoperatively, than when we used traditional milling machines. In all these speeches was detected without overheating of the surgical site and there were no complications related to visibility in the operative field due to the effect of cavitation. The duration of the interventions has increased an average of 15 minutes compared to the methods with the use of traditional milling machines. There has been a major saving of tissue and bone windows in the creation of this, both in childhood and in adulthood, has led to better and faster healing tissue.

Conclusions. Piezoelectric surgery is a very innovative technique in the oro-maxillo-facial surgery. While it is always dependent on operator technique, everything mentioned above, allows us to state that piezoelectric surgery is a highly effective method, which can certainly replace the traditional methods ensuring a better result in terms of quantity and quality.

Bilateral pleomorphic adenoma of the parotid gland: a particular case

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It is estimated that salivary gland tumours constitute about 3% of all head and neck tumours. Pleomorphic adenoma is the most common tumour of the parotid gland and represents about 80% of benign salivary gland tumours. It generally manifests as isolated, unilateral finding. The authors describe the case of a 37-year-old female patient, who reported the occurrence of a swelling of the bilateral mandibular angle 5 months previously. The left parotid region was operated on first, and after six months the patient underwent surgery for volumetric increase in the contralateral gland. Further tests showed a pleomorphic adenoma also in the right salivary gland. The reported case highlights the importance of appropriate follow-up even for low-incidence diseases.

Comparison between the variations of the orbital volume and the upper airway volume after Le Fort III advancement in craniofacial malformed subjects

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Aim. The purpose of this study was to compare, through 3D-CT images, the change of the orbital volume with the variation of the upper airway volume after Le Fort III advancement in subjects affected by craniofacial syndromic malformations. Material and

Methods. 3D CT Scan images processed by DICOM files in Dolphin 3D Software were used to assess orbital volume and upper airway volume in 4 subjects affected by craniofacial syndromic malformations before and after the Le Fort III advancement. The pre-operative (T0) and post-operative (T1: 6 months after surgery) 3D craniofacial CT scans of the subjects, were collected and retrospectively analysed. Image segmentation of the anatomic structures of interest and the 3D graphic rendering were obtained by Dolphin Imaging Plus™ 11.0 software. The variation of the orbital volume was compared with the change of the upper airway volume.

Results. Both the orbital volume and the upper airway volume increased. The augmentation was statistically significant. In addition, an increase of the surface of the orbital volume was observed.

Conclusions. Both the orbital volume and the upper airway volume after Le Fort III advancement, in subjects affected by craniofacial syndromic malformations, increase. Dolphin 3D Software is a reliable instrument to process 3D CT Scan images and to evaluate the facial volume variations after orthognatic surgery.

Cosmetic approach in parotid surgery

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Aim. Skin incisions have tended to be smaller if surgical exposure is not greatly compromised, especially for benign lesions of the head and neck. An incision in a visible area of the neck needs to be moved to hidden or less prominent sites or away from the head and neck. For esthetic considerations, the preauricular broken/postauricular trichophytic skin incision was developed for parotid surgery. Patients and

Methods. This retrospective clinical study enrolled 36 patients (20 women, 16 men) with benign preneural parotid tumors. Six months postoperatively, the patients were specifically asked to rate their satisfaction with their postoperative appearance on a scale of 1–10, with higher scores meaning better patient satisfaction, and whether they would consent to the operation again.

Results. All patients were satisfied with the cosmetic outcome: 24, 9, and 3 patients rated the procedure 8, 9, and 10, respectively.

Conclusions. The preauricular broken/postauricular trichophytic skin incision provides generous access to the parotid gland, which is at least as good as the access provided by a Blair's incision. It is an esthetically superior incision that allows good surgical access and improved contour reconstruction.

Crestal Sinus Lift: a case report

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Aim. Hignoro antrum, or maxillary sinus, is a cavity within the maxillary bone which joins the alveolar crest to form the outer wall, while the lower wall is normally contiguous with molars and first premolars, and its walls are covered by Schneiderian membrane. Initially, Scialom needles were used to surround the sinus, because they were very thin, until the recent elevation of atrophic crests with bone grafts. The term maxillary sinus lift indicates the increase in volume of the maxillary bone and the resulting sinus lift, a technique that allows having an adequate bone volume on the subsequent implant insertion.

Case report. The clinical case is a 45-year-old male patient with 2mm severe crest atrophy. After pharmacological treatment and surgeries performed to remove periodontal pockets or caries, one can decide to opt for sinus lift. There are two techniques: caldwell-luc or crestal sinus lift. The surgical approach to crestal sinus lift is simple: after mucosal elevation, a bar is gently tapped to the osteotome in order to obtain a green wood fracture to the cortical bone of the sinus floor, paying close attention not to lacerate the membrane and during membrane elevation for implant placement. Absolute silence is extremely important to evaluate the sound of the bar tapped to the osteotome. Sinus lift is performed with platelet growth factors.

Conclusions. It is important to underline that this technique reduces the healing time and avoids long-lasting window healing times, which can even be one-year long. Today, implants with a good grip allow to perform sinus lift on thin bones and implants can be placed in one surgical time.

Ectopic third molar and odontogenic cyst in the maxillary sinus associate with sinusitis : a case report

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Ectopic teeth are rarely found in the maxillary sinus. When they are, they represent an anomaly of odontogenic development that is generally associated with odontogenic cysts, trauma, or idiopathic etiology. Although affected patients are often asymptomatic, documented morbidities include sinus disease that is often refractory to treatment. Treatment of symptomatic patients and those with an antral mass is surgical, with either a Caldwell-Luc operation or an endoscopic procedure. We describe what we made to D.I.A., female, 22 years old, with the element 1.8 in the maxillary sinus associate with recurrent sinusitis and sinus vestibular cortical erosion.

Effects of orthognathic surgery on the airways in the III dento skeletal class

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Orthognathic surgery is used regularly to treat dento-skeletal deformities. The surgical procedures create changes in facial aesthetics and on the posterior airways (PAS). Our study intends to assess the effects of orthognathic surgery on the posterior airway size in patients with class III malocclusion. Were considered 41 patients treated with orthognathic surgery. To evaluate the morphology of the airways have been used latero-lateral cephalometric radiographs before and one year after surgical treatment, by the measurement of ad1 and IPS. The repositioning of the jaw has a great effect on subsequent respiratory airway. These movements cause an increase in the nasopharyngeal and hypopharyngeal distance in each group.

ENT assessment in the integrated management of candidate for maxillary sinus lift

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Aim. Maxillary sinus lift has a well-known impact on the delicate homeostasis of the maxillary sinus and the concomitant presence of systemic, naso-sinusal or maxillary sinus disease may favour the development of post-operative complications such as maxillary rhino-sinusitis, which can compromise a good surgical outcome.

Methods. On the basis of these considerations, the management of sinus lift candidates should include the careful identification of any situations contraindicating the procedure and, if naso-sinusal disease is suspected, a clinical assessment by an ear, nose and throat specialist, which should include nasal endoscopy. Moreover, if necessary, a computed tomography scan of the maxillofacial district can be performed, particularly in the ostio-meatal complex. This occurs during a preventive-diagnostic step (first step), which should be dedicated to detect presumably irreversible and potentially reversible contraindications to a sinus lift. Then, the preventive-therapeutic step (second step) is aimed at correcting, mainly with the aid of endoscopic surgery, such potentially reversible ear, nose and throat contraindications as middle-meatal anatomical structural impairments, phlogistic-infective diseases and benign naso-sinusal neoplasms the removal of which achieves naso-sinusal homeostasis recovery, in order to restore the physiological drainage and ventilation of the maxillary sinus. The last situation requiring ENT assessment concerns the management of iatrogenic complications, such as maxillary rhino-sinusitis, and is realized in the diagnostic-therapeutic step (third step). It is aimed at ensuring early diagnosis and prompt treatment of maxillary rhino-sinusitis in order to avoid, if possible, implant loss and, in particular, the related major complications.

Conclusions. The purpose of this report is to describe these three steps in detail within the context of a multidisciplinary management of sinus lift in which otorhinolaryngological factors may be the key to a successful outcome.

Evaluation of bond strength to Zirconia based ceramic after different conditioning procedures

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Aim. Maxillary bone necrosis could result the mechanisms of bisphosphonates' action that could explain the avascular or drug-induced bone necrosis of the jaw. They include the 'inhibition of osteoclast proton pump required for the dissolution of' hydroxyapatite, the reduction of the formation/activation of osteoclasts, the induction of osteoclasts apoptosis. Authors show their experience in the management of these lesions according to the international protocols of the AAOMS position paper on bronj, and adding to these minimally invasive treatments, the help of ozone therapy, platelet gel and fibrin glue to enhance the response of tissue regeneration.

Methods. Authors present a study on 98 patients with osteonecrosis of the jaws seen at St Andrew Hospital of Rome, in the Maxillofacial Surgery Department between January 2005 and January 2010. The patients observed were: 57 male and 41 female (mean age of 60 years). All of them undergone previously to treatment protocols (included bisphosphonates) for various diseases: 51% for multiple myeloma, 29.5% breast cancer, 7.14% for prostate cancer, 4% for lung cancer, and 8.16% for osteoporosis. The symptoms presented ranged from simple local pain, exposure of necrotic bone tissue as a result of minimally invasive operations, up to necrosis with purulent drainage. All patients underwent radiographic study as panoramic XR and CT Dental scan. Our treatment protocol included: non-invasive surgery (dental extractions, sequestrectomy or courretage in outpatient) associated with: cycles of ozone therapy pre and post-surgery using a device type Ozonitron[®]. (according to our school protocol), while using antibiotic therapy (β -lactamic antibiotics, anti-fungal therapy), and furthermore local injections of platelets gel and fibrin glue in the necrotic site.

Results. Of the 98 patients: 70 undergone to combined protocol of minimally invasive surgery, pre and post ozone therapy, and injection of growth factors. It led to a 25% stability and sterility of the injury, associated with resolution of pain, in 75% it has showed mucosal regeneration and symptoms regression. 23 patients underwent to dental extractions and ozone therapy, showing wound healing. 1 patient underwent surgical to sequestrectomy in operating room, 1 patient died during treatment, and 3 patients, who showed bone lesion just in radiographic exams without mucosal injury, were treated only with ozone therapy.

Conclusions. The study of literature shows that the prevention remains the best treatment for bronj. It is based on a proper dental assessment and/or on any surgical extraction of teeth before subjecting the patient to treatment with bisphosphonates, and the real need in recruiting these drugs. The effectiveness of ozone therapy has been demonstrated in recent studies for its power in stimulating circulation, increasing tissue oxygenation and angiogenesis, then its bactericidal and analgesic effects. We also introduce the further use of platelet gel and fibrine glue application, whose local growth factors increase the re-epithelialization and help in reducing healing time.

Four Different options for the rehabilitation of post-oncologic mandibular defects: the Maxillo-Facial Prosthesis Center experience

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The aesthetic and functional rehabilitation of patients with large mandibular defects following cancer surgery remains a challenge. The recent introduction of microvascular reconstructive methods has changed the options for prosthetic rehabilitation. Four major prosthetic options exist in rehabilitating a mandibular defect after surgical ablation of a tumor. This poster describes these four different options for the rehabilitation of post-oncologic mandibular defects. In the option of an overdenture on natural teeth, the patient avoids inserted implants: useful for patients receiving radiotherapy or for those with some natural teeth remaining after surgery. In the option of an overdenture on implants, the minimum number of implants is employed to stabilize the complete denture: option indicated for those anatomical situations where a good osteomucosal support is available for a complete denture after tumor surgery. A Toronto bridge is indicated when, in contrast, the mucosal support cannot be used for a complete denture because of an unfavorable histological prognosis or anatomical impairment. An implant-supported fixed prosthesis, is the treatment of choice in patients treated with a massive bone ablation, restored with a microvascular fibula flap. Osteo-distraktion may be needed if a double-barrel bone reconstruction is not planned because of the insufficient height of the fibula with respect to the plane of occlusion.

Giant follicular cysts of the upper jaw invading sinus- nasal cavity and ethmoid-orbital structures in young patients. Diagnostic - surgical strategies and long term follow-up

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Aim. Dentigerous (follicular) cysts develop from follicular epithelium and they are more potential for growth, differentiation and degeneration than radicular cysts. Due to their tendency to expand rapidly and greatly to displace teeth germs, when they are associated with impacted superior third molars, it's possible a massive invasion of antral cavity and other surrounding anatomical structures with clinical nasal, orbital, nervous and sometimes inflammatory complication. In these cases basic radiological examination often fails to describe the extent of the lesion. The AA describe two cases of very large and expanding follicular cysts.

Clinical Cases. Case 1 - Young female, 16 years aged with swelling of the right cheek and oral vestibule, right exophthalmos and diplopia. We performed Spiral CT that showed a massive lesion occupying the whole maxillary sinus with extension into the pterygo-maxillary space, due to the destruction of the posterior antral bone wall. Above the lesion compressing the orbital floor. Anatomico-clinical study was completed by MR imaging that showed good the interface cyst / soft tissues of the pterygo-maxillary space and orbital structures, and the characteristics of the wall, useful for surgical planning. Transantral surgical excision was performed with approach to the pterygo-maxillary space and orbital structure also using the operating microscope. Five years follow-up (clinical, radiological and MR imaging examination) shows a good restore of antro-ptyerygo-maxillary and orbital structures without relapse. Case 2 - Young female, 22 years aged with swelling of the left cheek and oral vestibule, left nasal obstruction, orbital pain. Also in this case the integrated study Spiral CT-MR allowed a very accurate study: the lesion occupied the entire maxillary sinus, the pterygo-maxillary space, the left nasal cavity, ethmoidal structures with posterior orbital compression. Transantral surgical excision was performed with approach to the pterygo-maxillary space; nasal-ethmoidal and orbital structures were approached by endoscopic technique. Follow-up shows a good clinical, anatomical and functional conditions. Histological examination showed in both cases a pattern of follicular dentigerous cyst.

Conclusions. Giant follicular cysts especially in young subjects pose the need for accurate preoperative study in relation to the delicate structures involved and interested. Inflammatory complications make excision even more laborious. In these cases, the operating microscope and endoscopic surgical procedures are necessary in certain surgical passages in order to perform the operation safely since the lesion must be detached in deep areas, not easily accessible and very delicate.

Hilotherm® efficacy in controlling postoperative facial oedema

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Aim. A cooling system based on polyurethane preshaped masks for postoperative cryotherapy named Hilotherm® has been recently introduced. The purpose of this study is to evaluate the effectiveness of this equipment in controlling postoperative oedema and compare the results with those obtained with a group treated with conventional cryotherapy and a group not treated with cryotherapy.

Methods. 90 patients were included in this randomized controlled trial. The 90 patients were divided into 3 groups. Group A was treated with Hilotherm®. Group B was treated with conventional cryotherapy. Group C was not treated with cryotherapy. Using a tape measure we measured for both sides of the face the distances in cm between point 0 and external canthus(α), most lateral point on the ala of the nose(β), commissura labialis(γ) and Pos(δ). We made Kruskal Wallis test comparing the average variation of oedema on the right and left side of the face for each facial segment of the patients of 3 groups from time 0 to time 24h.

Results. No cryotherapy is the worst treatment for every segment studied. In anatomical regions defined β , γ and δ Hilotherm® was more effective in containing oedema than the ice pack 24h after the first measurement. Opposite results were seen on district α , the site not completely enclosed in the mask.

Conclusions. The substantial difference between different treatments probably consisted in the greater reliability of the Hilotherm® system.

Management of BRONJ: ozone, platelet gel and fibrin glue as elements for improvement of the international protocol' treatments. Our experience

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Aim. Maxillary bone necrosis could result the mechanisms of bisphosphonates' action that could explain the avascular or drug-induced bone necrosis of the jaw. They include the 'inhibition of osteoclast proton pump required for the dissolution of' hydroxyapatite, the reduction of the formation/activation of osteoclasts, the induction of osteoclasts apoptosis. Authors show their experience in the management of these lesions according to the international protocols of the AAOMS position paper on bronj, and adding to these minimally invasive treatments, the help of ozone therapy, platelet gel and fibrin glue to enhance the response of tissue regeneration.

Methods. Authors present a study on 98 patients with osteonecrosis of the jaws seen at St Andrew Hospital of Rome, in the Maxillofacial Surgery Department between January 2005 and January 2010. The patients observed were: 57 male and 41 female (mean age of 60 years). All of them undergone previously to treatment protocols (included bisphosphonates) for various diseases: 51% for multiple myeloma, 29.5% breast cancer, 7.14% for prostate cancer, 4% for lung cancer, and 8.16% for osteoporosis. The symptoms presented ranged from simple local pain, exposure of necrotic bone tissue as a result of minimally invasive operations, up to necrosis with purulent drainage. All patients underwent radiographic study as panoramic XR and CT Dental scan. Our treatment protocol included: non-invasive surgery (dental extractions, sequestrectomy or curettage in outpatient) associated with: cycles of ozone therapy pre- and post-surgery using a device type Ozonitron[®]. (according to our school protocol), while using antibiotic therapy (β -lactamic antibiotics, anti-fungal therapy), and furthermore local injections of platelets gel and fibrin glue in the necrotic site.

Results. Of the 98 patients: 70 undergone to combined protocol of minimally invasive surgery, pre and post ozone therapy, and injection of growth factors. It led to a 25% stability and sterility of the injury, associated with resolution of pain, in 75% it has showed mucosal regeneration and symptoms regression. 23 patients underwent to dental extractions and ozone therapy, showing wound healing. 1 patient underwent surgical to sequestrectomy in operating room, 1 patient died during treatment, and 3 patients, who showed bone lesion just in radiographic exams without mucosal injury, were treated only with ozone therapy.

Conclusions. The study of literature shows that the prevention remains the best treatment for bronj. It is based on a proper dental assessment and/or on any surgical extraction of teeth before subjecting the patient to treatment with bisphosphonates, and the real need in recruiting these drugs. The effectiveness of ozone therapy has been demonstrated in recent studies for its power in stimulating circulation, increasing tissue oxygenation and angiogenesis, then its bactericidal and analgesic effects. We also introduce the further use of platelet gel and fibrine glue application, whose local growth factors increase the re-epithelialization and help in reducing healing time.

Mandibular Fractures associated with Atlanto-Axial Subluxation and Cranio-Cervical Derangement

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Aim. In previous research we verified that the maxillo-mandibular asymmetric dysmorphism corresponds to asymmetry of cranio-axial structures. They in fact constitute an unitary osteo-muscular system in functional balance where the imbalance in one of the areas causes the functional imbalance in other areas. Because facial fractures determines an acute asymmetric alteration of the structures, we performed also a study on facial trauma to identify the same neuro-muscular-skeletal modifications of the axio-cervical structures found in maxillo-mandibular asymmetries.

Study Design. Having previously already performed a specific study on fractures of the mandibular condyles, we considered 30 cases of mandibular fractures, 23 single (angle 12, body 9, ramus 2) and 7 multiple (3 bilateral, 4 associated to other facial fractures), with the following inclusion criteria: absence of associated or previous cervical trauma, absence of previous cervical pathology, absence of asymmetric facial dysmorphism. We also considered a control group: 10 subjects (5 males, 5 females, aged from 20 to 27 years) suffering from isolated cervical trauma (whiplash) in which we have not found alterations of the cranio-cervical joint.

Results. - The study by traditional X-ray, CT,CT-3D and MR revealed that in mandibular fractures the acute break of osteo-muscular facial symmetry causes the acute break of the spatial equilibrium in the occipito-atlanto-axial joint with following constant evidences: atlas rotation omolateral to the site of fracture or to the site of greater muscular imbalance in the multiple fractures; occipital-atlanto-epistropheal subluxation; joint derangement. The alterations are tridimensional. Surgical treatment, performed to restoring the mandibular anatomical structure and the muscular vector, obtained also the postural rebalancing of the whole integrated system including the symmetrical rearrangement of junctional complex.

Conclusions. - The alterations that we found are a new nosographic element not considered in the mandibular fractures, with important clinical and insurance relevance. They represent also a physio-pathological element for cervical distortion in these cases. Derangement of atlanto-axial joint may be possible physio-pathological basis of cranio-brachial-cervical pain syndromes, according to the same mechanism that we found in maxillo-mandibular asymmetries.

Options for rehabilitation of post-oncologic maxillary defects: the Maxillofacial Prosthesis Centre experience

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Bone continuity defects of the upper jaw following ablation of tumours can lead to a significant lack both in aesthetic and in functional aspects. In recent years the wide variety of reconstructive options available changed the traditional view of rehabilitating maxillectomy patients with obturator. Local flaps can be helpful for small defects, temporalis flap and free tissue transfer techniques can be used for bigger defects. From a prosthodontic point of view, four major options exist in rehabilitating maxillary defects: 1) a removable prosthesis, 2) an overdenture prosthesis on natural teeth, 3) an overdenture prosthesis on implant, 4) an implant supported fixed prosthesis. According to our experience in extended maxillary defects, to have stable functional dentition an implant supported fixed prosthesis on fibula free flap is the best choice of treatment. Maxillary reconstruction should be guided by prosthetic planning of the implant supported prosthesis. The desired vertical elevation of the fibula microvascular free flap for implant placement can be achieved through osteogenic distraction guided by a prosthetic template. Oncologic patients management plans are improved by a multidisciplinary approach with the cooperation among maxillofacial surgeon, implantologist and prosthodontist since the first step of the treatment.

Orbital volume and surface after Le Fort III advancement in craniofacial malformatted subjects

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Aim. The purpose of this study was to determine the changes of the orbital volumes through 3D-CT images before and after Le Fort III advancement in 4 Caucasian subjects affected by craniofacial syndromic malformations. **Material and Methods.** 3D CT Scan images processed by DICOM files in Dolphin 3D Software were used to assess orbital volume and surface in 4 subjects affected by craniofacial syndromic malformations before and after the Le Fort III advancement. The pre-operative (T0) and post-operative (T1: 6 months after surgery) 3D craniofacial CT scans of the subjects, were collected and retrospectively analysed. Image segmentation of the anatomic structures of interest and the 3D graphic rendering were obtained by Dolphin Imaging Plus™ 11.0 software.

Results. The orbital volume and the orbital surface increased after surgery, with statistical significance.

Conclusions. Both the orbital volume and the orbital surface increase after Le Fort III advancement, in subjects affected by craniofacial syndromic malformations. Dolphin 3D Software is a reliable instrument to process 3D CT Scan images and to valuate the facial volume variations after orthognatic surgery.

Ossification of the vascular pedicle in free fibula flap: diagnosis and treatment of an unexpected complication

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The use of free fibula flap has become, from the mid 90s to now, the gold standard for maxilla and mandibular reconstructions. It presents many advantages: 1. plasticity; 2. possibility of harvesting a composite flap; 3. low morbidity of the donor site; 4. possibility for implant-prosthetic rehabilitation; 5 possibility for a two team approach reducing operating time and therefore costs. To maintain bone flap vitality it is mandatory to preserve periosteum during the shaping. The vascularised periosteum attached to the vascular pedicle has an osteogenic potential. Such preservation is responsible for an unexpected complication (to be found in the literature to a maximum rate of 4% of cases): ossification of the vascular pedicle. Some authors proposed to dissect the periosteum from the vascular pedicle to avoid the risk of ossification. Some others are reluctant to perform this "extra" dissection as the ossification is rare and often asymptomatic. In our experience the incidence of pedicle ossification is much higher. Based on a systematic OPT and CT scan follow up study at 6 and 12 months post-op, we could diagnose 6 pedicle ossifications on 31 free fibula reconstructions (19 %) in the period between 2004 and 2007. After this analysis from 2008 we started dissecting the periosteum from the vascular pedicle routinely and up to day no pedicle ossification was observed in a group of 15 free fibula reconstructions with a minimum follow-up of 12 months.

Osteochondroma in atypical mandibular region

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Università degli studi di messina

Aim. Osteochondroma or Jacob's disease is the benign form of bone cancer most common among the people; only rarely it affects the facial skeleton with a higher incidence on the coronoid process and the mandibular condyle. The treatment of choice, the onset of symptoms, is surgery. Presentation of the lesion in an atypical site with radiological and iconographic documentation supported by clinical evidence we object to.

Methods. We present the case of a male aged 14 with osteochondroma located at the corner joint, accompanied by documentation radiological, histological and iconographic.

Results. A young boy came to our attention due to swelling in the cheek region that was painless with hard tissue at the palpation and no breaks in the mucosa. It was decided to treat the tumor with surgery and to analyze it istopatologically.

Conclusions. This type of hamartoma borns from an island of fertile subperiosteal cartilage that grows to produce bone with features similar to skeletal increasing and stop its development at the same time with the rest of the skeleton. Retromolar location sounds as unusual, according to the international literature, between the regions most affected. The treatment of choice is surgical and is implemented only whe the symptoms are showing.

The dental management of cancer patients in childhood

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Sapienza Universita' Di Roma

Aim. The treatment of pediatric oncological patients requires a multidisciplinary approach, involving figures such as maxillofacial surgeon, the oncologist, pediatrician, the orthodontist, and, finally, the prosthodontist. Surgical procedures should relate primarily to the need to rehabilitate the lost structures, look of strong psychological impact, and by no means least important factor, with the patient skeletal growth. Authors' aim is to show the path followed in our school for the management of these patients.

Methods. In this paper we show two cases of pediatric oncological patients treated in all mentioned aspects until adolescent age, and currently in various treatment stages.

Results. The pediatric post oncological patient therapy can and must clearly evolve over time in order to follow the patient through the stages of growth. It is the latter, along with constant monitoring of the disease itself, to direct the clinicians choices.

Conclusions. Nowadays it is possible, with a work that necessarily takes years to be brought to a conclusion, to give a good QOL for patients who have suffered from serious treatment of neoplastic diseases. This result, however, is the consequence of interdisciplinarity and coordination between the different actors of the treatment.

The piezoelectric surgery in a case of supernumerary tooth

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Aim. A rare case of supernumerary tooth is discussed and treated with piezoelectric surgery technique.

Methods. A boy, aged 8 years reported to our dental clinic with complaint of one supernumerary tooth in the left lower molar area; following orthodontic consultation it was decided to surgically remove the supernumerary tooth using a piezosurgery instrument.

Results. Nerves, vessels and soft tissue are not injured by the microvibrations which are optimally adjusted to target only mineralized tissue. The precise nature of the instrument has allowed exact, clean and smooth cut geometries during surgery.

Conclusions. The piezoelectric instrument uses a modulated ultrasonic frequency that permits highly precise and safe cutting of hard tissue.

The prosthetic rehabilitation of post oncological patients: mobile or fixed prosthesis

E. Brauner, G. Guarino, C. Andrea, F. De Angelis, M. Fadda, G. Pompa, V. Valentini

Sapienza Universita' Di Roma

Aim. The dental management of post oncological patients is an exciting challenge; maxillo-facial surgery has reached standards that allow us to rebuild, in a predictable and valid way, many of the structures lost in the neoplastic processes; dentistry cannot be outdone. The aim of this paper is to show the rehabilitative options available to the clinician who faces this world.

Methods. Authors present here three cases of post oncological patients rehabilitation: one operated for a recurrence of pleomorphic adenoma rehabilitated with dentures, the second operated for a spino-cellular carcinoma rehabilitated with removable prosthesis on telescopic crowns and finally a patient with Premaxilla necrosis in childhood and rehabilitated with fixed prostheses on implants.

Results. Type of cancer and the administered treatments are important factors in evaluating the treatment of a post-oncological patient: radio-chemotherapy, surgery, extent of demolition and condition of the soft tissues are crucial. These elements must be carefully evaluated by the dentist in collaboration with the surgeon, the radiation oncologist, the oncologist and the physical therapist.

Conclusions. On the basis of a fruitful interdisciplinarity, it is possible, for post oncological patients, to return to a QOL comparable to the one previous the cancer disease, choosing, from case to case, the most suitable technique and approach.

Use of piezosurgery in orthognathic surgery: our experience

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Aim. The purpose of this study is to illustrate some applications of piezoelectric drill in orthognathic surgery.

Methods. Piezosurgery® Medical is an ultrasonic surgical system that is slowly picking up steam in the field of orthognathic surgery as a viable alternative to the traditional drill.

Results. In particular we have studied the use of Piezosurgery for bilateral sagittal split osteotomy, Le Fort I osteotomy and genioplasty. The main advantages are its high precision cutting, a safe preservation of soft tissue and the reduction of the risk of damage to the osseous tissue due to cooling caused by the saline solution and due to selective frequency of the insert tip.

Conclusions. In our experience the use of Piezosurgery has not extended the time required for surgery and has reduced the postoperative pain due to a minimal cell damage at the margins to the bone matrix, which can lead to a better healing and a consolidation of the osteotomies.

ORAL HYGIENE AND PREVENTIVE DENTISTRY

Assessing the effectiveness of a clinical preventive risk-based caries protocol in a young population

E. Bizzotto, S. Mazzoleni, M. Callegaro, A. Zuccon, A. Simonetti, E. Stellini

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Aim. To evaluate the effectiveness of a risk-based dental caries prevention program at a Paedodontic Unit of University of Padova.

Methods. 53 patients aged 3-16 years, mean age 8.11, were individually evaluated for caries-risk by responses to a questionnaire about: past caries experience, child's dietary, clinical examination, host susceptibility, salivary factors and microbial colonization. The children were placed in 3 different risk categories which have been applied specific prevention protocols.

Results. After 1 year, there is a significant decrease of "high" (P-value<0.05) and "intermediate" risk groups (P-value<0.05). After 2 years, the re-evaluation of caries-risk in 32 patients has underlined the significance of treatments carried out (P-value<0.05) and the validity of methods used to identify risk-level (P-value<0.05).

Conclusions. This risk-based caries prevention program yielded successful outcomes and appears to be a promising model for dental caries prevention.

Caries risk in patients with gastroesophageal reflux

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Aim. Gastroesophageal reflux (GERD) determines into the oral cavity acidic environment, causing loss of mineralized tissue of the tooth surface by direct exposure to intrinsic acids. To assess caries experience (DMFT) in GERD patients and its relation to caries risk factors, dental erosion. clinical and anamnestic variables.

Methods. To determine caries risk, the patients have been administered CaMBRA Protocol (Caries Management by Risk Assessment) and tested for the evaluation of quality and quantity of oral biofilm. The examined factors are: minor salivary glands secretory function, saliva consistency, saliva buffering capacity and pharmacological variables. Result: The sample consist of 107 GERD patients and 107 control patients.

Results. Show statistically significant correlation between GERD, tooth decay and salivary parameters: saliva pH is in fact highly significant for all clinical and anamnestic variables, including the extent of damage for erosion. DMFT of GERD patients appears to be significantly related to age, severity of erosion, salivary function and buffering capacity. Discussion and

Conclusions. The qualitative and quantitative parameters of plaque and saliva in the observed patients showed that GERD emerges as a risk factor for carious disease. Specific preventive counseling protocol should be therefore planned for this type of caries-risk patients.

Chlorhexidine use in daily practice: operative protocols

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Aim. Chlorhexidine digluconate is widely used in dentistry for at least three decades. It is considered the leading agent for the chemical control of plaque and clinical efficacy is worldwide recognized; side effects are also well known. Literature regarding this antibacterial agent is immense. However, the variety of commercially available products helps to create confusion in clinical practice. The aim of this work is to evaluate and describe the use of chlorhexidine digluconate in oral prevention and therapy, using commercially-available products.

Methods. a literature research (using “chlorhexidine digluconate”, “oral health”, “preventive protocols” and “therapeutics protocols” as keywords) was performed in PubMed and Medline database, with Limits to “Dental Journal” and “Published in the Last: 10 years”.

Results and conclusions. Chlorhexidine digluconate represents, today, the Gold Standard of anti-plaque agents. It is not fully clear which method of administration, or concentration or product is better to use in terms of efficacy and which produces less side-effects. In literature, there is not consensus on a universally accepted protocol, but many variants based on different methods of use and clinical requirement are reported. The present study wants to provide clinicians evident-based chlorhexidine digluconate protocols to adopt in the different clinical situations.

Clinical and qualitative assessment of a new ultrasonic tip for peri-implant detoxification

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Aim. Nowadays the use of implants seems to be one of the best rehabilitation therapies for patients who show partial or total edentulous. It allows to re-establish both functionality and beauty at high levels and as long as possible.

Aims: to evaluate from a clinical and qualitative point of view the usage of the new insert IS Tip STS-3E® on those tissues which seem to be affected by inflammation.

Methods. Was selected patients having implanto-prosthetic rehabilitation and showing inflammatory symptoms. First of all, some relevant parameters need to be registered: plaque index, bleeding on probing, purulent exudate's presence and probing depth. Then, peri-implant's detoxification is executed using IS Tip STS-3E® tips. Finally, 1% chlorhexidine gel is applied. Implants conditions was checked four weeks after therapy, comparing the new values with the parameters registered during the first session.

Results. IS Tip STS-3E® treatment produced a considerable decrease in plaque and bleeding on probing indexes as well as a reduction in probing depth.

Conclusions. Although seems that probing depth do not show relevant changes, the most important information is a decrease in bleeding on probing percentage from 82% to 14%. Moreover, is possible to observe an improvement of the tissues condition and a complete resolution of every inflammation symptoms.

Clinical indices of implants health on a sample of patients undergoing pre-implant surgery

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Aim. Aim of the study was to evaluate the implants health in patients undergoing bone reconstruction of serious atrophies with extra-oral withdrawal and subsequent insertion of osto-integrated implants.

Methods. A test group of 54 patients were considered: 49% of them undergoing an extra-oral withdrawal of iliac crest, 26% of them from the calvaria and 25% with implants in basal bone. For a clinical evaluation the patients have been entered in a monitoring protocol of the perimplantar tissues. The required clinical index were: IP, BOP, PPD, suppuration and mobility.

Results. 191 implant sites were examined for a total of 1146 probed sites. The result was that after 3 months, 6 months and one year 42 sites were affected by mucosity; 17 sites with graft of iliac crest, 19 in basal bone and 6 in site of graft of calvaria. 40 of these sites in the upper maxillary and 15 in mandibular. 16 of probed sites were affected by periimplantitis, 4 in iliac crest, 4 in basal bone and 3 in calvaria.

Conclusions and discussion. The cause of the failure of implants could be a bacterial cause due to the poor cooperation of the patient to follow in a strict way the oral hygiene at home and to be present at the recall session for professional hygiene.

Clinical-experimental comparison between two different sealants and application methodologies

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Aim. This study aims to compare two different kinds of dental sealants. Each selected subject has been treated with both products. The product used is the dental sealant Embrace Wetbond Pulpdent: it is a sealing resin, photo-polymerizable with fluoride release that chemically and micromechanically sticks to the dental surface in presence of humidity; such sealant is compared, from clinical point of view, to Clinpro Sealant 3M, a photo-polymerizable sealant at slow fluoride release. When it is spread on the humid tooth, the product reacts through two reaction methods: water reaction on the humid surface of the tooth and reaction with the tooth surface.

Methods. A group of 15 patients of age between 6 and 12 years old has been selected. Sealings on molar and/or premolar teeth in I-IV quadrant with sealant Embrace Wetbond Pulpdent, molars and/or premolars in II-III quadrant with sealant Clinpro Fissure Sealant. The difference between the two products is based on the application method: the first one has been spread on a humid base; the second one, hydrolytic, has been spread on a completely dry set of teeth.

Results. The sealing valuation has been made on damaged margins and on sealant quantity on dental surface base, assigning a value among 1 (0-29% sealant) and 4 (80-100% sealant). We can see that 5 of the 23 sealings made with the sealant applied on a humid surface have been completely lost.

Conclusions. The meaning of this work has been that of comparing the dental sealant Embrace Wetbond Pulpdent and Clinpro Sealant, from sticking and efficacy point of view. The first resin is not a valid substitute of the second one, since it shows low adhesion to the tooth in a short period of time, application difficulty because of its liquid stiffness.

Dental Erosion in Patients with Gastro-Esophageal Reflux (GERD)

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Aim. Gastro-esophageal reflux (GERD) is a gastrointestinal disease where gastric acid reaches the oral cavity, on a daily basis. To examine whether there is a significant prevalence of dental erosion in patients who have GERD and to relate with all the clinical and anamnestic variables according to the protocol.

Methods. After selecting a GERD group and a control group, a file was filled up for the evaluation of BEWE index, questionnaire on GERD symptoms and a clinical form for caries risk assessment.

Results. 214 subjects were examined, equally divided by gender and age into two experimental groups: 107 in GERD group and 107 in the control group. Statistical significant correlation ($p < 0.05$) is established between the level of dental erosion risk in the GERD group with 37% vs. 2% of the control group. Acidic diet, pH of plaque and saliva have been assessed as significant risk factors for erosion. Discussion and

Conclusions. The GERD group has shown a high risk for erosion. A significant diet acid in GERD group determines the severity of erosive lesions and further aggravates the symptoms of gastro-esophageal reflux. Is necessary to establish treatment protocols for preventing and managing dental erosion and GERD.

Desensitising efficacy of a new dentifrice: double-blind randomized controlled trial

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Aim. Individuals with Dentine hypersensitivity (DH) have wider and more numerous tubules than non-sensitive surfaces, which are mostly covered by a smear layer. The aim of the study was to evaluate the desensitising efficacy of a new dentifrice based on zinc-carbonate hydroxyapatite (CHA) nanocrystals.

Methods. Using a double-blind, randomized design, the new dentifrice was compared with KNO₃ dentifrice (control). Participant's DH was evaluated at baseline and after 4/8 weeks using Airblast, Tactile, Cold water, Subjective tests (5 min. gap between stimuli's application). Subject response recorded: 0 no significant discomfort; 1 discomfort; 2 severe pain; 3 severe pain after stimulus removal.

Results. 70 subjects with baseline DH: 36 received the new dentifrice; 34 the control one. Both dentifrices were effective: the score reduction from baseline to 8 weeks was greater than 28% for all tests in both groups. Experimental subjects had a significantly greater improvement in Airblast test score (reduction 46.0% versus 29.4% in controls) and Subjective test score (47.5% vs 28.1%, respectively), differences being significant already after 4 weeks. In contrast, no significant difference between groups for Tactile or Cold water.

Conclusions. CHA nanocrystals produce re-mineralization of the altered enamel surfaces and be effective in closing dentinal tubules. This study documented that the new dentifrice containing zinc-CHA nanocrystals significantly reduced DH after 4/8 weeks.

Eating habits and lifestyle in the incidence of dental caries in obese paediatric patients

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Aim. The aim of the clinical-statistic study was to perform an assessment of dietary habits, lifestyle, oral hygiene in dental caries incidence in obese paediatric patients.

Methods. A sample of 107 subjects, aged between 6 to 12 years (average age 8.6 years) were classified as underweight, normal weight, pre-obese, obese in relation to body composition assessment obtained by the use of Dual Energy X-ray absorptiometry (DXA) and McCarthy growth charts and cut-offs. The subjects have been submitted to dental examination to assess the dmft/DMFT, and have completed a specific questionnaire. Statistics. The statistical analysis was performed with SPSS Software. A multivariate analysis has been performed and ANOVA models have been applied.

Results and conclusions. The obese children had higher indexes of caries than normal weight and pre-obese subjects, both in deciduous teeth ($p=0.030$, $p=0.020$) and permanent teeth ($p=0.019$, $p=0.011$). A significant correlation between dmft/DMFT indexes and free mass percentage (%FM) was observed ($r=0.221$ for dmft, $p=0.026$; $r=0.237$ for DMFT, $p=0.014$). The data collected have shown a statistical significance between the percentage of fat mass-dental caries and consumption of soft drinks between meals ($p=0.050$), sedentary lifestyle ($p=0.009$), parents' education level ($p=0.018$), while no statistical significance between obesity-dental caries and oral hygiene ($p=0.146$) has been observed.

Evaluating the effectiveness of oral antiseptics in the treatment of moderate to severe periodontal disease through microbiological analysis

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Aim. Study the efficiency of two different periodontal irrigators with respect to six different periodontal pathogen bacterial families, by assessing their quantities before and after treatment.

Methods. 30 patients among 30 and 70 years affected by periodontal disease and in general good health were selected, divided into three groups of ten people each; the same operational protocol was used for each group and for each person. The only difference among the groups was the type of periodontal irrigators employed: group one was treated with a mouthwash of chlorhexidine (CHX), group two with a mouthwash of Essential Oils (EO), group three with water as a placebo.

Results. The bacterial count of the six pathogens analyzed decreased significantly and almost always in a statistically significant way in the group treated with CHX as well as in the group treated with EO, without registering solid differences between the two antimicrobials. On the contrary, only a slight improvement in the pathogenic count – which was of no statistical importance - was recorded in the group treated with placebo.

Conclusions. The results obtained suggest that the Essential Oils action is similar to that of the Chlorhexidine. In particular, this research highlights the importance of employing topical antimicrobial agents as fundamental tools to prevent relapses and as an effective support to the common casual and mechanical non-surgical therapies.

Evaluation of the effectiveness of two disposable oral hygiene devices

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Aim. The aim of our study was to evaluate the plaque removal efficacy of two disposable devices for the dental hygiene, a low density polyethylene (LDPE) tooth-brush and a polyurethane (PUR) little sponge (Kimberly Clark Medival, Zaventem, Belgium).

Methods. This is an experimental, randomized controlled study on a sample of 47 young healthy male and female adults. The subjects were assigned in a Test group, that used the two disposable devices to test, and in a Control Group, that used own personal traditional tooth brush. Plaque index, according to Dababneh (NMPS: new method plaque scoring), and gingival index, according to Löe and Silness (GI), have been evaluated at the beginning of the study (T0) and after 48 hours (T1). The data were evaluated by ANOVA followed by Sheffé's test, as post hoc. Student's t test was used for evaluation of paired samples. The presence of plaque in the different dental sites recorded with the NMPS index has been valued with the test of Kolmogorov-Smirnov.

Results. After 48 hours, we observed a statistically significant increase of the plaque index in the test groups in respect with control worst for sponge than for disposable toothbrush.

Conclusions. The use of both disposable devices instead of traditional ones are only justified to the need to exclude cross contamination in special need patients and their use are not recommended routinely.

Experimental study of the efficacy of an spray based on essential oils in comparison with a chlorhexidine spray

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Aim. The purpose of this study was to evaluate the power of an anti-inflammatory and antibacterial spray based on essential oils in comparison with the effects of a chlorhexidine spray. The spray used is on the market as the golaftin oral spray, and it's a nutritional supplement made from propolis, echinacea, altea, acerola, vitamin e and zinc.

Methods. Were selected 17 patients of both sexes, aged between 15 and 44 years. The patients at the beginning of the study were subjected to sessions of oral hygiene professional, then trained on the modified bass brushing technique. Data were recorded at time 0 (two days after the oral hygiene session) and time 1 (after one week). In the week between T0 and T1, each patient was given a bottle containing a solution of essential oils to be used morning and evening instead of mechanical brushing.

Results. In the group of patients treated with chlorhexidine spray, the increase in plaque index between T0 and T1 phase is inferior to others, unlike the group treated with the spray of essential oils which has seen a sharp increase of plaque index. We can infer from these data that the spray made from essential oils have a lower probability of causing mucosal desquamation.

Conclusions. The purpose of this study was to test the efficacy of a topical solution containing essential oils and the study emphasizes that the effectiveness of the spray examined to control gingival inflammation is significantly reduced. A low result on the control of plaque and inflammation by the product with essential oils can be associated with different properties with which the product acts to control the biofilm. The role of the dental hygienist is important to identify the action and the effectiveness of various commercially available antiseptics in order to be able to use the best management for maintaining the oral health of the patient.

Experimental Study on effects of Er:Yag Laser for the treatment of dentine hypersensitivity

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Aim. The aim of the present study was to verify the effect of Er:Yag Laser on dentine hypersensitivity. **MATERIALS AND**

Methods. 40 healthy patients with dentine hypersensitivity referred during anamnesis to upper incisors (both sexes, mean age 37 years, no smoking) were selected for the present study. The pain was evaluated before treatment by using the Visual Analogue Scale (VAS) and by air-emission from a standard air emission syringe. The patients were divided randomly into an experimental group of 20 patients treated with Er:Yag Laser (Fidelis Plus II, Emmeciquattro Fotona, Italy), and fluoride gel and a control group treated just with a fluoride gel.

Results. The results revealed statistically significant differences between the groups because in the experimental group there was 85% reduction of dentine hypersensitivity compared to 56% of the control group.

Conclusions. The use of ER:Yag Laser in association with fluoride gel resulted useful in dentine hypersensitivity treatment.

Health Promoting Schools - Multimedia Project of oral health in primary schools in the City of Latina

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Aim. The purpose of the Health Promoting Schools is to train students with knowledge, attitudes and values that address them to health-oriented choices. With this project we wanted to test the effectiveness of a multimedia game designed to attract the attention of elementary school children to basic concepts of oral health and use the instrument to identify students' knowledge.

Methods. A multimedial game on oral health was designed and administered in the computer class room, before and after an educational stage, to 656 third (8-9 years) and fifth graders (10-11 years) of nine schools in the province of Latina.

Results. Overall there was a significant improvement among fifth graders, extended school time classes and females. The results, however, show superficial Oral Health knowledge, being total percentage of correct answers only 45%. These data are even more worrying given the simplicity of the administered questions.

Conclusions. The school has proved an ideal environment for oral health promotion projects, both for the availability of the target population, and for efficiency and speed of child population screening. The results stress the importance of the school environment as point of access to health services for all socio-economic classes. Creating a game from the multimedia features, has proved a valuable tool to attract the attention of children in a historical era where technology has taken control of mass communication.

Influence of oral hygiene procedures on the development of candidosis and ventilation-associated pneumonia (VAP) in patients undergoing orotracheal intubations

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Aim. The recent literature underlines the importance of oral hygiene in the reduction of microbiological flora and ventilation-associated pneumonia (VAP) in patients undergoing orotracheal intubations hospitalized in the Intensive Care Unit. The aim of the study was to evaluate the impact of two different oral hygiene procedures on the development of oral candidosis and VAP in this kind of patients.

Methods. A sample population of 50 intubated patients (range age:17-84 years-old), 31 males (62%) and 19 females (32%) were randomly assigned to two different groups: the first one (G1) was treated with sterile water and chlorhexidine 0,2%, the second group (G2) was treated with sterile water only. The diagnosis of oral candidosis was obtained considering the microbiological results of repeated oro-pharyngeal swabs. The presence and gravity of the infection were classified by a quantitative score.

Results. Statistical analysis (univaried ANOVA test) did not demonstrate any significant differences on candidosis development between groups. Three patients developed VAP (9,4%) and twenty-eight had a positive bronchial-aspirate for candida (87,5%) in G1 while seven patients developed VAP (38,8%) and seventeen had a positive bronchial-aspirate for candida (94,4%) in G2.

Conclusions. Considering the reduced frequency of VAP cases in G1 but the elevated incidence of positive bronchial-aspirate for candida in both groups, it is hypotizable that chlorhexidine is not able to inhibit the development of oral candidosis but could contribute to reduce the frequency of VAP thanks to its antibacterial action.

Is HPV-related Oral Cancer a Basis to Extend Vaccination to Young Males?

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HPV-related outcomes has been regarded till now as feminine gender-linked pathologies. In Italy anti-HPV vaccines has been supplied free to all 12 years old girls, to prevent cervical cancer onset. The vaccine is made of virus-like particles and protects from HPV 16 and 18, responsible of 70% of cervical cancer. Some epidemiological considerations suggest the opportunity to get a new vision for HPV, particularly considering HPV-related oral cancer. Li From an analysis of literature emerges that HPV-16 is involved as prognostic risk indicator in patients with squamous cell oral carcinoma (Sugiyama 2007). Scully (2005) underlines as the incidence of oral cancer is increasing in young adult population and that some cases cannot be explained with the correlation alcohol-tobacco, being HPV indicated as the infective agent, particularly for oro-pharyngeal cancer, with pathogenic potential for ano-genital lesions. Campisi et al, 2007, reviewing literature, have shown that, due to high frequency, HPV can have a role in the pathogenesis of some oro-pharyngeal cancer types.

There is no gender predilection for HPV-related oncogenic process in the oral cavity. On this basis, is possible to understand how HPV cannot be considered a mere female pathogen and that its role in oral cancer etiology need to be more investigated with possible recommendation of vaccine license extension to young males not already exposed to HPV.

Long-term effect of xylitol chewing gum on caries in children: (a 2-years follow-up)

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Aim. The hypothesis was that the daily use of chewing gum with high dose of xylitol for six months would reduce the increment of decayed tooth surfaces (Δ DS) in schoolchildren.

Methods. 204 subjects (mean age 8.3 ± 1.2 years) with 2-3 manifest caries lesions and a salivary mutans streptococci (MS) concentration >105 CFU/mL were selected and randomly assigned (double-blind) to a Xylitol group (11.6 g/die plus sorbitol, maltitol and mannitol) or Non-xylitol group (same ingredients but isomalt instead of xylitol). Two years after completing the trial, the caries status, salivary MS and lactobacilli were reevaluated. Additional 47 eligible children were also examined (No-gum group). 195 children (70 in the Xylitol group, 78 in the Non-Xylitol group and 47 in the No-gum group) were evaluated. Response variable was the development of a detectable caries lesion (D1-D3) in first molars.

Results. At 2-years follow-up, statistically significant differences were observed in caries index among the three groups (0.84 decayed surfaces for the No-gum group, 0.67 for the Non-xylitol group and 0.13 for the Xylitol group). Caries increment was significantly associated with treatment ($p < 0.001$) and salivary lactobacilli level measured at follow-up ($p < 0.001$).

Conclusions. Six months use of high dose of xylitol seems to produce a long-term preventive effect on caries development.

New technological approaches in maintenance of implant patient: micromorphology/micorbiological analysis

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Aim. To evaluate which of the following inserts EMS Steel Tips(A), EMS Peek, IS TiP STS-3E©, used with piezoelectric ultrasonic handpiece, is more effective in decreasing the bacterial peri-implant without compromising the implant surface during the professional oral hygiene.

Methods. 13 Winsix dental implants (SLA surface 4,5x11 mm) divided in five test groups: SEM control: 1 implant untreated Microbiological Control: 3 implants inoculated but untreated Group A: 3 implants contaminated and treated with steel tip EMS Group B: 3 implants contaminated and treated with Peek tip EMS Group C: 3 implants contaminated and treated with IS TiP STS-3E© Magnifications at 500x were carried out over groups A-B-C and SEM control.

Results. Group A: Increase of bacteria in bacterial count Group B: Significant reduction in bacterial count Group C: Significant reduction in bacterial count All test groups (A-B-C) have denoted damages on the implant surface. Best results were obtained with the IS TiP STS-3E© insert, which caused very light damages.

Conclusions. The gold standard of a perimplant maintenance therapy is to have a mechanical “defense” to be less aggressive as possible, but leading to a significant reduction of bacteria. As a consequence and in view of the above mentioned results, the Authors of this study recommend to use an antimicrobial agent in association with IS TiP STS-3E© which could bring to a remarkable reduction of bacteria.

New therapeutical prospects at Dental Hygienist's disposal: Ozone and Laser therapy

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Aim. The purpose of this study was to evaluate the action mechanism of Ozone and Laser, and to appraise the possible applications for the dental hygienist in a primary and secondary prevention program through a literature review.

Methods. This study was developed through an extensive revision of the current literature and with a questionnaire directed to practitioners.

Results. The use of ozone is spreading in dentistry (for its oxidizing and bactericidal power) thanks to the development of closed-circuit devices capable of producing vacuum ozone and to carry it directly on the oral lesion in a condition of absolute safety for the patient. The ozone therapy in dentistry led to inactivation of 99.9% of cariogenic bacteria carrying out also other actions like analgesic or anti-inflammatory. The use of laser technology is achieving high standards in dentistry with established protocols and an excellence state of the art. The use of Laser can make significant benefits in dental hygienist daily clinical practice: the effect of bacterial decontamination, the analgesic, the desensitizing effect and its use in the process of teeth whitening. The use of laser technology allows to shorten much time of professional services, offers a more comfortable and painless technique.

Conclusions. The ozone and the laser may enter in dental hygienist daily clinical practice, being a valuable aid both in a primary and secondary prevention.

Oral health status of elderly people in Rome-Italy

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Aim. To assess the dental and oral health status and treatments needs of the elderly population in Rome in order to quantify the need for care, providing at the same time data for future reference and possible future dental care provision considering that there has not been conducted a similar survey in our city.

Methods. 316 non institutionalized patients all living in Rome underwent a complete oral and dental examination following the WHO's criteria (World Health Organization, Oral Health Surveys: Basic methods-4th ed.-WHO, Geneva(1997)). Statistical analysis was performed using SPSS Inc, ver. 13.0, Chicago, IL, USA. A p-value of less than 0,05 was considered significant.

Results. The prevalence of edentulousness was 4.4%. Missing teeth were 3346(37,81%). After dividing patients into 4 age groups (65-69, 70-74, 75-79, 80 and over) we found that only in the first group(65-69) women had a lower number($p<0.001$) of missing teeth than men: female 359 (23,31%), men 393 (35,08%). Mean number of remaining teeth per subject was 17,41. Both genders in the mandible presented a greater number of teeth present (9.02 on average) than the maxilla (8.27 on average)- $p=0.002$. DMFT index was 14.65 (D:7,73%, M:81,57% and F:10,69%). Regarding CPI 14,5% of the sextants resulted healthy, 4.9% had gingival bleeding on probing, 20.7% had dental calculus, 17.0% periodontal pockets 4-5mm deep, 1.4% pockets 6 or more mm deep and 41.5% of the sextants were excluded.

Conclusions. Values of DMFT index and CPI are promising compared to others European country. The status of oral health was significantly better in women than in men in the first age group 65-69, increase in age results in a worsening of all indices both men and women without any statistical significant difference between the two genders.

Oral hygiene in patients with r.p.d. prevention and maintenance

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Dental implants allows us to address and resolve functionally and aesthetically high complex cases. Longitudinal studies shows us the reliability of this therapeutic method in anatomically complex cases and with complex surgical techniques. Now, especially in the geriatric patient, may not wish to undergo difficult surgical methods to rehabilitate the posterior edentulous areas, In these cases the use of r.p.d. can be appropriate choice. This type of prosthesis is well accepted by patients. The long term success requires a prudent planning and a proper oral hygiene with regular checks at reduced intervals (Preti-Pera 1991). The authors after a valuation of opportunity of this prosthetic choice, dwell about oral hygiene maintenance, allowing the integrity of dento-periodontal system of the dental abutment, which results in an excellent acceptance of r.p.d. by the patient, generating the clinical success.

Oral prevention in umbrian nursery and primary school

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Aim. The caries pathology is a pathology that has a multifactorial origin. The presentation or not of caries pathology is influenced by an imbalance between the factors that favour the caries onset and the protective factors toward oral health. So that to resolve the caries pathology is necessary to intervene, on the predisposing factors, by recurrent control visits to the dentistry for oral hygiene and with a detailed informative program about the importance of the oral health.

Methods. Our study consists about an educative program of prevention and information in the nursery and primary schools. The purpose of this program is that to pass the basic concepts on the methods of daily hygiene, the importance of the oral health and a right dietary, with the involvement of the parents. The study consists in some play didactic lessons made both in nursery and primary schools, from 4 to 10 years old children.

Results and conclusions. This program has awaked children and parents to not only the caries pathology but above all to the health and a right dietary. We feel right, after the results of this educational program, to control the results and the effects of such project, by the data collection with the collaboration of the pediatrics and a project of prevention on our field.

Oro-maxillo-facial malformations and history of bioethics. Educational project for Dental and Dental Hygiene Students

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Aim. A training course, concerning the historical origins of bioethics and the Nuremberg Trials is presented, sponsored by the Department of Oral and Maxillo-Facial Sciences, University "La Sapienza" of Rome. Eugenics is in fact the theoretical and practical basis for the selection and murder of people considered unsuitable or harmful to the Nazi project of racial purity. Materials And

Methods. We examined various historical documents in the context of eugenics promoted by the Nazi regime. Clinical parameters of selection for "racially inappropriate" included oro-maxillo-facial conditions, such as prognathism, dental anomalies, or cleft lip and palate.

Results. The analysis of the documents shows the involvement of scientific and professional dental organizations in the design and execution of German so called "racial hygiene" in the Nazi program of eugenics, Aktion T4, which interested people with "genetic or incurable diseases and physical deformities". It is estimated that the implementation of the T4 program has resulted in the killing of a total people between 60,000 and 100,000.

Conclusions. The educational project is intended to inform and sensitize the future oral health professionals about the theme of bioethics and its historical origins.

Peri-implant tissue in patients treated with revascularized fibula free flaps. Clinical considerations

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Aim. The aim of this study is to evaluate the clinical conditions of peri-implant tissues surrounding 133 implants embedded in 23 patients treated through revascularized fibula free flaps.

Methods. From 1993 up to 2004 23 patients were treated with this procedure and 133 bone implants were positioned. The cumulative survival rate (CSR), the crown to implant ratio and the months of prosthetic loading were then evaluated. Other clinical records considered were PPD, DIM, BOP, BL, CSR and VPI. Furthermore frequency and modality of oral hygiene were investigated.

Results. Follow up of prosthetic rehabilitation is 5,7 years. Implant CSR was 95% and prosthetic CSR was 100%. About 90% of the implants presented both bleeding and plaque, and about 22% of implant sites presented suppuration. No patient was being cured by a dental hygienist, while all of them found difficulties in oral hygiene procedures. Three patients were smokers.

Conclusions. The results underline the importance - for implant and prosthetic survival - of prosthesis configuration and support by a dental hygienist for the maintenance and monitoring of clinical conditions of peri-implant tissues.

Periodontal disease, oral hygiene and DMFT index in HIV+ patients

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Aim. Literature reports that HIV infection makes you more susceptible to opportunistic infections. Oral lesions can present as viral, mycotic and bacterial infections or neoplasias. Periodontal diseases are different in HIV+ and HIV- individuals, indeed HIV+ patients present uncommon lesions as: erythematous gingival banding, necrotizing gingivitis and necrotizing periodontitis. The aim of this study was to value the prevalence of periodontal diseases related to CD4+ cell count and oral hygiene status in HIV+ patients. In this study we valued also the DMFT.

Methods. We followed HIV+ patients attended at the center of infectious diseases of Trieste. The first visit included: Intra-oral and extra-oral exams, DMFT index, X-rays, photos and periodontal charting. In the second visit the patients received mechanical debridement, which included scaling, root planning and oral hygiene instructions.

Results. Almost the totality of patients presented an inadequate level of oral hygiene. We noticed that 35% of patients reported general periodontal diseases but only 30% of them had a low level of CD4+ cell count (<380 cell/uL). This result could be influenced by bad oral hygiene, which was confirmed by the high DMFT index.

Conclusions. Periodontal disease as measured by hygiene index is not directly associated to CD4+. Professional and home oral hygiene improve periodontal conditions and this is important in the maintenance of oral health.

Periodontal status in oral lichen planus patients: results of a case-control study

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Aim. Oral lichen planus (OLP) frequently involves the gingival tissues. Some authors have suggested that OLP can induce a worsening of periodontal health, but a clear evidence is still lacking. To evaluate the periodontal status of OLP patients and to compare it with a group of healthy controls.

Methods. 30 patients were enrolled in this study. Oral parameters included full mouth plaque score (FMPS), full mouth bleeding upon probing scores, probing depths (PD), gingival recession (GR), clinical attachment level (CAL), mobility score, furcation involvement, number of missing teeth. Symptoms were evaluated using a Visual Analogue Scale. Results of the study group were compared with a control group matched with age, sex and social status.

Results. PD, CAL, GR, mobility and number of missing teeth were increased in cases when compared to controls. The differences were statistically significant ($p < 0.05$). Differences in domiciliary oral hygiene routines were observed, but the differences were not statistically significant.

Conclusions. Our results showed that periodontal status is worse in OLP patients if compared with healthy controls, but the difference is not due to oral hygiene. OLP can be considered a negative prognostic factor for the development of the periodontal disease.

PH during a new bleaching treatment with spray of hydrogen peroxide 35%: preliminary results

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The aim of this study was to evaluate pH of the dental surface and of the oral mucosa at rest and during the use of a new bleaching treatment spray of 35% hydrogen peroxide. The bleaching system consists of three different products: 1. Primer (30 seconds, 15ml) that contains xylitol and prepares the pH of the mouth for the whitening treatment; 2. hydrogen peroxide 35% whitening solution to be applied with a nozzle applicator to spray directly on the teeth; 3. Remineralizer (30 seconds, 15 ml) containing fluoride, xylitol and hydroxyapatite decreasing tooth porosity and sensitivity. A group of 12 subjects in good oral health conditions were selected. Recording of pH was performed with a portable device used in gastroenterology for 24-hours monitoring of pH of oesophagus and stomach (pH-day 2, Menfis, Italy) on the surface of the upper central incisor before and after the whitening procedure and in the fornix in correspondence of the upper molars during the procedure. The results showed a high variability among the subjects: pH at rest $6,7\pm 0,5$ on the dental surface and $6,6\pm 0,4$ on the mucosa of the upper fornix. Using the Primer pH of the mucosa increased to $7,0\pm 0,2$, with the whitening solution pH decreased to $4,9\pm 0,3$, with the Remineralizer pH increased to $7,5\pm 0,3$. At the end of the procedure pH of the enamel recovered to the initial values while the pH of the mucosa showed a slight increase ($0,5\pm 0,2$). The experimental procedure was completed without complications and was well tolerated by the patients, despite the sharp decrease of pH applying the whitening solution the action of the primer and the remineralizer seem to protect the hard and the soft tissue from damage.

Piercing and Oral Health

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Piercing (prevalence 10%-51%) is a fashion of our times with ancient origins. It represents different lifestyles depending by the historical and geographical time in which is made. The piercing of interest for the dentists are those applied on lips (upper and lower), tongue (on the anterior third), cheeks. From references, oral piercings cause complications and infections short and long term. Damages include: transmission of virus (HIV, HBV, HCV) when piercing if not respecting hygiene; ulceration of the wound during the first weeks after application; lack of thorough cleansing of piercing and his point of application with consequent risk of bacterial accumulation with halitosis and short and long term infection; possibility of developing gingival recession in the surrounding area of the piercing; risk to develop diastema due to the continues interposition of the jewel between the incisors (upper and lower); taste alteration for the continues exposure of taste buds to the piercing; enamel abfractions and fractures. Target. The aim of this study is to purpose clinical protocols for an effective monitoring and management of the patient with piercing for prevention.

Prevention of Baby Bottle Tooth Decay

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Aim. with "baby bottle tooth decay" is meant partial or complete destruction of teeth caused by a carious process. The prevalence varying from 1% to 12% in industrialized countries and values above 70% in developing nations.

Methods. In the Department of Pediatric Dentistry, Department of Surgery and Stomatology of Cagliari, come to our observation of children aged between 2 and 9 years old. Among these was found a high percentage of "baby bottle tooth decay". Therefore it was decided to raise families, through the development and provision of learning material, drawn from the Ministerial Guidelines, "National guidelines for the promotion of oral health and prevention of oral diseases in children". Were carried out with handouts, which are described: the main diseases of the oral cavity (BBTD), the principles inherent in the primary prevention of oral cavity, related to proper nutrition and healthy lifestyles and adequate. Each family also received, the outcome of the visit and the plans for treatment.

Discussions and conclusions. Children at risk of early tooth decay, may be recognized in one year of age on the basis of: the information provided by parents, social and demographic factors, dietary habits, oral hygiene, the presence of *Streptococcus mutans*. When you have all the variables, the possibility of developing BBTD is 87%. It is therefore crucial awareness among families about the importance of preventing this disease you.

Preventive and therapeutic protocols for patients with leukemia

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Aim. Patients with leukemia are placed in a preventive process with the objective to learn the correct methods to obtain an optimal level of oral hygiene. There are three factors that influence the effectiveness of brushing: 1) the type of toothbrush 2) the technical and personal skills 3) the frequency and duration.

Methods. Before cancer therapy: The main objective is to prevent secondary oral infections and rapidly decrease the bacterial load of the oral cavity using the technique of "full mouth disinfection", which allows a reduction of probing depth and the total elimination of swelling, hyperemia and bleeding. The leukemic patient, before starting the cancer therapy, is subjected to professional topical fluoride, and is required to make use of dental floss and toothpaste containing fluoride at home. During cancer therapy: the leukemia patient in cancer treatment is often unable to perform common operations, therefore, the dental hygienist will be responsible for adapting the common techniques of brushing according to the individual. The use of fluoride gel continues during cancer therapy, as it has been shown to reduce the after-effects of "dry-mouth". Due to frequent dental hypersensitivity, oral hygiene at home can be practiced using an ultra-soft toothbrush without neglecting the fluoride gel.

Discussions and conclusions. The dental hygienist is inserted in the oncologic team performing cancer prevention and early treatment of oral diseases. Dental hygienists must deal with patients with leukemia just like with all patients with "special needs", but follow the standardized treatment protocols adapting to the needs of the patient.

Professional oral hygiene treatment and detailed oral hygiene instructions in patients affected by mucous membrane pemphigoid with specific gingival localization.

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The oral cavity and in particular the gingival tissue are the most common sites for Mucous membrane pemphigoid (MMP), accounting for 83% to 100% of all the MMP patients reported. The presence of epithelial desquamation, erythema, and erosive lesions on the gingival tissue is described as “desquamative gingivitis” (DG). It has been suggested that DG could play a role in increasing the long-term risk for periodontal tissue breakdown at specific sites. The aim of this case series was to ascertain the clinical efficacy of a professional oral hygiene protocol followed by detailed oral hygiene instructions in patients affected by MMP with specific gingival localization. All cases received non-surgical periodontal therapy including oral hygiene instructions, thorough supragingival scaling and polishing with removal of all deposits and staining, in a 3-week cohort study. Clinical outcome variables were recorded at each visit and included full mouth plaque (FMPS) and bleeding (FMBS) scores, the clinical extension of gingival involvement, and patient related outcomes (VAS). A total of 12 patients (11 females) were recruited. After finishing the oral hygiene and periodontal therapy protocol, a statistical significant reduction was observed for FMPS, FMBS and reported pain ($P=0.028$). Standard professional oral hygiene procedures and non-surgical periodontal therapy are associated with marked improvement of clinical and patient related outcomes in gingival cases of MMP.

Removing action on hydroxyapatite (HA) stains by polyvinylpyrrolidone (PVP) at different concentrations in vitro

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Aim. To evaluate the efficacy of PVP 2%, 5% or 10% over removal stain on HA.

Methods. HA was stained in a tube by a Lipton Black Tea solution stirred. Stained HA was filtered, washed and dried. The stained HA powder was used for the test after two weeks. It was divided in 4 tubes to undergo different treatments: control: the tube was filled with water; test 2%: with a solution PVP 2%; test 5%: with a solution PVP 5%; test 10%: with a solution PVP 10%. All tubes were stirred for 5 minutes. HAs were filtered, washed and then dried. The HAs (test 2%, 5%, 10% and control) were imaged in the same picture and processed with Adobe Photoshop to calculate $L^*a^*b^*$ and ΔE^*ab .

Results. The stained HA treated with 2%, 5% or 10% PVP or control to remove stains gave the following colour parameters: water treated HA L 65 a 21 b 23, PVP 2% treated HA L 65 a 20 b 24, PVP 5% treated HA L 67 a 21 b 23, PVP 10% treated HA L 67 a 20 b 21; ΔE^*ab were respectively 1.4, 2.2 and 3.5 for 2%, 5% and PVP 10% compared to control. Discussion: ΔL (luminance, strictly linked to white intensity) compared to control suggests that solutions 5% or 10% PVP are capable to remove stains from HA but this effect is not clearly visible by not expert eye. L for stained HA treated with PVP 2% is not different from control. There is no considerable difference between the solution 5% and 10%.

Conclusions. results suggest that 5% and 10% PVP solutions are capable to reduce staining.

Screws titanium healing vs zirconia: microbiological and clinical differences of bacterial flora

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Aim. Evaluate clinical and microbiological parameters of 3 different materials used to make healing screws in use as implant components, and identify a material of choice to minimize the possibility of being contaminated by the bacterial species.

Methods. 4 patients and 19 healing screws: 1 titanium screw treated with antibacterial 6 zirconia screws 12 titanium screws untreated. We performed salivary tests for the detection of *S. Mutans*, plaque index (Loe and Silness) and bleeding index (mBI) on each screw. For each healing screw was carried out testing of bacterial plaque from the peri-implant sulcus and then be examined by hybridization of DNA of different periodontal pathogenes bacterias from the Laboraf laboratory at the hospital S. Raffaele in Milan.

Conclusions. Zirconia healing screws were found to be less retentive of plaque. The examination of saliva for detection of *S. Mutans* showed that all patients belonging to the study were negative. Implant patient management remains complex and begins long before the time of surgery by the insertion of the fixture. The patient a candidate for implant prosthetic rehabilitation have to be educated and motivated. Good plaque control at home we know a great therapeutic goal to prevent the onset of peri-implant disease. Dental hygienist job is to accompany the patient to reach a good level of oral hygiene at home and to be able to get a good compliance.

Smile, self- appreciation, recovery of sociality: clinical trial on patients with severe mental illness.

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Roma - Università degli Studi La Sapienza

Aim. Chronic severe mental illness, such as schizophrenia or bipolar disorder, produce a poor attention and motivation in personal care and disinvestment from the body. Therapeutic interventions on these patients seek to prevent the most damaging effect, first of all aggression, neglecting physical wellness, including oral health.

Methods. Information through questionnaires about lifestyles and oral hygiene were gathered on 16 patients (10 males, 6 women) aged from 30 to 61, with severe mental illness divided into: schizophrenia (13), bipolar disorder (1), antisocial personality disorder (1) and (mental deficiency (1); then, relatively to lifestyles and oral hygiene, two levels of intervention were applied: 1- modification of oral hygiene and diet; 2- teaching of correct brushing, then professional debridement and bleaching.

Conclusions. Taking care of oral health, we purpose to promote activity rather than passivity, self- improvement, openness to others and, consequently, improvement of social life.

Three fissure sealants: a comparative study on 2640 schoolchildren.

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Aim. Fluoride is able to reduce caries susceptibility. Fluoride release in gingival crevicular fluid from fluoride (F)-containing fissure sealants was investigated in a randomized clinical trial.

Methods. 2640 schoolchildren (age range 6-7 yy) were randomly divided into three different groups: 1) a high-viscous Glass-Ionomer-Cement (GIC); 2) a resin-based sealant (with F); a traditional resin-based sealant (without F). A total of 8472 sealants were placed. Gingival crevicular fluid around the sealed teeth was collected at baseline (t0), 2 days after the placement of the sealant (t1), one week after (t2) and finally three weeks after (t3).

Results. At t1 the fluoride release was statistically higher in GIC group compared to the other two ($p < 0.01$). At t2, a statistically significant net increase in crevicular F concentrations was observed ($p = 0.04$) between GIC and traditional resin-based sealant.

Conclusions. High viscous GIC makes available a high initial fluoride concentration.

Tooth wear among patients suffering from mental disorders

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Aim. Assess oral health, treatment needs and the correlation between tooth wear and medications in patients with psychiatric disease.

Methods. 92 patients (40 male and 52 female) admitted in the Department of Neurology and Psychiatry of the Umberto I Hospital of Rome underwent an oral and dental clinical examination in accordance with the World Health Organization Basic Methods Criteria. One dentist performed all clinical examinations, training and calibration was carried out by an experienced clinical examiner. To measure the degree of inter-examiner agreement Kappa statistics was calculated. Level of tooth wear was assessed using the tooth wear classification of Johansson et al. Exact psychiatric pathology and medications of each patient were registered. The Statistical Package for the Social Sciences (SPSS Inc., Chicago, Ill.) was used to analyze the data. A value of $P < 0.05$ was considered statistically significant

Results. 34,78% of the sample regarding tooth wear demonstrated score 2. Men demonstrated 30% score 2 and 20% score 3 and 4 whereas female patients 38.46% score 2, 7.69% score 3 and none score 4. Regarding drug therapies 46.15% of the female patients received Depakin Chon against 20% of the male patients.

Conclusions. Chronic exposure to neuroleptic drugs can cause phenomena of bruxism. There is a definite correlation between tooth wear, psychiatric disorders and administration of certain drugs. Poor oral hygiene and extensive unmet needs for dental treatment were widespread among psychiatric patients.

Treatment of mucositis induced by chemotherapy and radiotherapy : options for prevention and role of home oral care and professional oral hygiene

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Aim. Antineoplastic therapies cause side effects that can still affect patients' quality of life. The most common side effects are: dry mouth, candidiasis and opportunistic infections, dysphasia, disgeusia, periodontal damages, dentine sensibility and mucositis. Mucositis is an inflammation of the oral mucosa which presents as painful ulcers and erythema. Ulcers first occur on non keratinized mucosa and then spread all over the mouth. These lesions are characterized by erythema and edema and can easily be super-infected, leading so to systemic infections. Reduce patients' discomfort caused by mucositis, through a protocol of oral hygiene, motivation and instruction, and through the control of oral infections. This was meant to highlight the importance of this preventive and curative treatment in the management of mucositis.

Methods. We visited 33 patients (8 in RT, 22 in CT and 3 in CT+RT, respectively, 10 with mucositis and 23 without lesions), evaluating patients' oral hygiene, plaque index, gingival index, bleeding index and took note of onset and progression of mucositis of each patient. Every patient was initially submitted to a professional oral hygiene session, with follow up every 2 weeks/1 month. After the end of the therapies they were included into a periodontal supporting program.

Results and conclusions. A good oral hygiene as well as good gingival status, is associated with a lower incidence and severity of mucositis, in accordance with literature.

ORAL PATHOLOGY

A new genomic methodological strategy in understanding PMD's evolution into oral cancer

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In the last years microarray technology has rapidly improved transitioning from basic research applications into detection and diagnostic formats. For instance, the most successful application of these genomic assays has been in the subtyping of human cancers, including the ability to predict clinical outcomes. We report a case of proliferative verrucous leukoplakia (PVL) evolved in cancer (OSCC). The CGH array analysis showed distinct segments deleted of 10 and 18 chromosomes. Chromosome 18 alterations have frequently been reported in OSCC, the region 18q21 contains some tumor suppressor genes and its loss is associated with tumor progression and poor prognosis. These data demonstrate the ability of CGH array to identify cancer related genes as well as novel chromosomal regions of genomic alterations involved in the tumorigenesis of OSCC. By identifying novel therapeutic targets and key molecular determinants of tumor biology, these studies will form the basis for improved understanding and treatment of these devastating tumors.

A program of oral hygiene in hospitalised patients for onco-haematological malignancies underwent chemotherapeutic treatments. Results from an open clinical trial

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Aim. Hospitalised patients could have a poor oral hygiene which may predispose, above all those immuno-compromised, with blood malignancies and/or underwent chemotherapy, to oral complications, including oral mucositis (OM). However, the care of the mouth in these patients is an area not routinely considered in the treatment planning. To assess the role of an oral hygiene education plan to prevent oral chemo-effects in hospitalized patients with blood malignancies underwent chemotherapy.

Methods. In 25 patients gingival and periodontal health status were assessed with Gingivitis Index (GI) and Plaque Index (PI); the tongue coat index (TCI) and the score of OM were also measured. All patients were instructed to a specific plan of oral hygiene. All the evaluations were performed at T0 (before starting chemotherapy), T1 and T2 (after 6-12 days of chemotherapy). The same evaluations were performed during the second hospitalization (T20, T21 and T22).

Results. GI, PI and TCI showed a significant ($p < 0.05$) amelioration during the first hospitalization. At T20, all patients started with an oral hygiene status significantly better than T0. OM was observed in 44% of patients at T1 vs only 8% at T21 with a score statistically less severe ($p = 0.02$).

Conclusions. This study shows as the management of individuals with blood malignancies should involve the collaborative efforts of hematologists and dentists, thus optimising treatment and minimising secondary complications deriving from the oral cavity.

A prospective clinical trial for assessing the efficacy of a minimally invasive protocol in patients with bisphosphonate-associated osteonecrosis of the jaws

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Thirty-four patients (14 males, 20 females) with jaw bisphosphonate-associated osteonecrosis (25 mandible, 9 maxilla) under treatment with zoledronate (27), pamidronate (3), alendronate (4) were enrolled. All patients received professional oral hygiene treatment and oral rinses, and when in pain they underwent amoxicillin/clavulanate potassium 1-g every eight h for the first two days and every 12 h for the next eight days, associated with metronidazole 500 mg every 12 h for ten days. All were followed-up every 3 months (mean duration: 16.0 ± 9.4 months). The results from the general linear model showed a statistically significant ($F=16.1$; $p<.01$; $r^2=.95$) time-related decrease in the size of exposed bone areas during the non-surgical therapy (from 12.5 ± 12.0 mm to 8.8 ± 10.3 mm). This conservative protocol seems to provide successful treatment in the vast majority of patients.

A survey of oral medicine biopsies: a 15 years experience of a single centre

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Aim. The aim of this study was to investigate the frequency of conditions affecting patients undergoing oral biopsy at a single oral medicine clinic.

Methods. Histological records of all patients attending the Oral Pathology and Medicine clinic of the Università degli Studi di Milano between January 1995 and December 2010 were entered in a database. Each record included sex, age, sampling date, anatomic region, histological diagnosis.

Results. A total of 4.350 oral biopsy records were analyzed, The vast majority of patients undergoing oral biopsy were taken from people of age between 41 and 65 years. Women were more common. About 150 were biopsy from pediatric patients. The most common histological diagnosis were lichen planus (916), traumatic pseudofibroma (137), hyperkeratosis (216), non specific inflammation(188), squamocellular carcinoma(220).

Discussion. Oral biopsy is a major diagnostic and sometimes therapeutic tool in oral medicine practice. The activity of our service grew significantly in the last 1 years. Premalignant and malignant lesions represent a relevant proportion of the cases included in the survey, although distribution of the different conditions is strongly dependent from age.

Altered expression of endothelial markers in biphosphonate associated osteonecrosis of the jaws

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Aim. Biphosphonate (BPs) are potent inhibitors of bone resorption and are widely used drugs for the treatment of osteoporosis and bone metastasis. However, some side effects after a long therapy with BPs have been recently documented. The most important is the osteonecrosis of the jaws (ONJ). It has been suggested that one of the potential mechanisms include the possible antiangiogenic effects of nitrogen-containing BPs. Thus, the aim of this study was to investigate the expression of two well-known vascular markers in ONJ.

Methods. 16 samples from patients with BPs-associated ONJ and 10 specimens of healthy bone, as controls, were used for the study. Specimens were analysed for VEGF and CD34 expression by immunohistochemistry. To evaluate the markers expression, a mean percentage of positive cells was determined and a semi-quantitative assessment was performed assigning cases to one of 3 categories: score 0 (0-25%); score 1 (25-50%); score 2 (>50%).

Results. There was a statistically significant difference in CD34 expression between cases and controls. Indeed, ONJ showed a reduced expression of CD34 compared to healthy subjects. On the contrary, VEGF expression was higher in ONJ than in controls, and this difference was statistically significant.

Conclusions. This preliminary observation support the theory that antiangiogenic effects of BPs could account for one potential mechanisms of ONJ. However, further studies with wider cases are necessary to confirm this issue

An unusual radiopaque lesion of the jaw: case report and review of literature

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Panoramic radiography is still the primary approach of investigation used by clinicians for the study and evaluation of the hard tissues of the lower third of the facial structures. Any radiographic examination is made up of structures with different opacity. Radiopaque lesions of the jaws are often difficult to differentiate. A case of a 55 years-old woman with an unusual asymptomatic radiolucent lesion of the jaw is reported. The patient was referred to our attention for a suspected oro-facial pain. During the anamnesis she referred a ten years-chronic assumption of oral bisphosphonates for osteoporosis and the extraction of the lower right second molar performed approximately 8 years ago. Intra-oral examination showed no oral lesion, no pain was evoked by palpation. Panoramic radiography showed a radiolucent lesion with the shape of the lower right second molar, previously extracted, like a "ghost tooth". Dentascan CT examination confirmed the presence of sclerotic bone around the post-extraction site. Although it has been previously reported it may be a thickening of the lamina dura in patients taking bisphosphonates, our case is the first report of an asymptomatic "ghost-like tooth" arising after extraction in bisphosphonate patients and it is probably related to a bone response to bisphosphonate. The patient has been subjected to clinical monitoring with regular visits and intraoral radiographs every 6 months for secondary prevention of bisphosphonates-related osteonecrosis of the jaw. This case shows as the anamensis is essential during the diagnostic path. The existence of radiopaque lesions potentially associated to bisphosphonates could be an incentive for reviewing the scientific literature about the radiopaque lesion of the jaw in order to develop and/or revise the diagnostic algorithm to help the clinicians to make a correct differential diagnosis.

Autofluorescence, narrow band imaging and liquid-based cytology in the early diagnosis of oral and oropharyngeal erythro-leukoplakias

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Aim. A number of technological improvements, such as autofluorescence (AF) and narrow band imaging (NBI), have been recently introduced as visual aids to assist the naked eye (NE) in achieving a more reliable distinction between normal and preneoplastic/neoplastic mucosa when dealing with erythro-leukoplakias as potential precursors of oral and oropharyngeal squamous cell carcinomas (OSCC and OPSCC). Even though the gold standard for such a diagnosis still remains histopathological evaluation of a fixed tissue sample, liquid-based exfoliative cytology (LBEC) has been demonstrated to have a high diagnostic accuracy in discriminating between normal mucosa and dysplastic/frankly neoplastic lesions. Aim of the present study is to prospectively evaluate the sensitivity (Se), specificity (Sp), positive (PPV), negative predictive values (NPV), and accuracy (Ac) of a diagnostic protocol including NE, AF, NBI, and LBEC in the evaluation of never biopsied before erythro-leukoplakias of the oral and oropharyngeal cavities.

Methods. Between November 2009 and December 2010, 53 patients with oral (n=50) and oropharyngeal (n=3) leuko-erythroplakias were prospectively evaluated at our Institution by NE, AF, NBI and LBEC. Results from NE, AF, and NBI were categorized as “suspicious” or “not suspicious”. LBEC samples were graded by a dedicated cytologist, blinded on the clinical and endoscopic findings, according to a 5-point-scale: O1, inadequate material; O2 benign cells; O3, cellular modifications suspicious for dysplasia; O4, cellular modifications suspicious for carcinoma; O5, cellular modifications strongly indicating carcinoma. Every patient was submitted to excisional biopsy of the entire lesion, submitted to a dedicated pathologist, blinded on the clinical and endoscopic findings and on the cytologic findings. True positive cases were those considered as “suspicious” at NE or AF or NBI and with histopathologic diagnosis ranging from mild dysplasia to invasive carcinoma. For LBEC, we considered true positives all patients with O3 or more and a histopathologic diagnosis ranging from mild dysplasia to invasive carcinoma. Se, Sp, PPV, NPV, and Ac were accordingly evaluated.

Results. Among 53 patients, NE turned out to be “suspicious” in 29; AF was “suspicious” in 24; NBI was “suspicious” in 31; LBEC samples were graded as follows: 1 O1, 21 O2, 15 O3, 7 O4, and 9 O5. On histopathologic evaluation of the excisional biopsies we found: 19 benign lesions, 6 mild dysplasias (SIN 1), 3 moderate dysplasias (SIN 2), 4 high-grade dysplasias or carcinoma in situ (SIN3/CIS), 17 microinvasive, and 4 invasive carcinomas. Se, Sp, PPV, NPV, and Ac of NE were 68%, 68%, 79%, 54% and 68%; for AF were 56%, 74%, 79%, 48%, and 62%; for NBI were 85%, 89%, 93%, 77%, and 87%; for LBEC were 79%, 84%, 90%, 69%, and 81%, respectively.

Cephalometric study in Arnold- Chiari syndrome

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Aim. The aim of this study is to assess cranio-facial dysmorphism in Arnold-Chiari 1 syndrome. We present the study performed on male patient affected by this syndrome. We analyzed his cranial structure, because there are not many cases in literature.

Methods. To better fix this patient's disease, we used lots of diagnostic criteria: genetic analysis, radiographic investigations, rhinomanometric measurements, and every kind of exams to determine patient's systemic condition linked to his syndrome.

Results. The results obtained after our investigation allowed us to clearly identify Arnold-Chiari 1 syndrome, at first, and to study cranio-facial elements related to his disease. Discussion: This patient presented with the pathognomonic signs of Arnold Chiari 1 syndrome. In particular, we focused our attention on those odontostomatologic aspects that had never been analyzed by others in literature: oral respiration, cranial dysmorphism, ogival palate. Besides these, dental crowding and other important elements were identified through cephalometric measurements.

Conclusions. At the end of their comparison with the existing literature, we can say that there are few recurrent odontostomatologic and systemic-generalized features which can be associated with this syndrome.

Chronic liver disease as inducing factor of oral lichen planus exacerbation: analysis of serological parameters

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Aims: Oral lichen planus (OLP) is deemed to be an extrahepatic manifestation in course of chronic liver diseases (CLD). To survey the incidence of OLP clinical exacerbations (OLPCE) in atrophic-erosive lesions, it was monitored the liver function status of OLP patients by serological assays. Material and

Methods. Seventy-one OLP-CLD patients (mean age 62.28 years \pm 7.42; range 48-78 years; female: male ratio 2.3:1) were selected into a 476 OLP cohort patients. Forty-eight out of 71 patients who had OLP associated with chronic HCV infection formed the test group. Twenty-three out of 71 patients who composed the OLP-CLD control group had a chronic drug-induced hepatitis.

Results. Incidence ratio of OLPCE was significantly higher among OLP-CLD patients who showed laboratory data alterations: test group ($P=0.0071$), control group ($P= 0.0034$). HCV infection and drugs inducing hepatitis status alone not seems to be cause of OLPCE.

Conclusions. Haematological alteration of liver parameters may induce OLPCE, not depending from base pathology.

Clinical and histological features of gingival lesions: a 17-year retrospective analysis in a Northern Italian population

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Aim. To analyse clinical and histological features of gingival lesions in the Northern Italian population and to compare obtained data with those of other countries.

Methods. Records of new patients' admissions for gingival biopsies to the Oral Medicine Section in the period 1993 to 2010 were reviewed. The lesions were then classified into 4 groups: Neoplastic (NL), non-neoplastic (NNL), premalignant lesions (PL) and lesions caused by autoimmune diseases (AL).

Results. The total number of biopsied samples were of 726. Malignant NL are 52, the majority of surgical samples from the maxillary attached gingiva. Benign NL are 7% with localisation to the maxillary attached gingiva and a higher incidence in males. Leukoplakia is the most frequently PL and the elective localisation is the gingiva of the maxilla, the majority of subjects are females. Oral Lichen is the most frequent AL followed by lichenoid lesions, pemphigoid, and pemphigus.

Conclusions. NNL are the most frequently. We confirmed an prevalence of oral squamous carcinoma above all other malignant NL, and, for the first time ever, an absolute prevalence of NL malign gingival lesions in the maxilla. This research is the first to highlight a prevalence of PL gingival lesions in the maxilla, which takes place with a higher incidence in females. Finally, this study is original and unique in showing that oral lichen are the major manifestations of desquamative gingivitis in a cohort of patients from the same clinic.

Color analysis of peri-implant mucosa: an in vivo study

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Aim. Aim of this study was to evaluate color properties of soft tissue around Straumann implants in the aesthetic area using a fiber optics spectrophotometer.

Methods. We performed color measurements of mucosa around Straumann implants in intercanine area (test sites) and in the corresponding gingiva of controlateral or adjacent natural teeth (control sites). The analysis was carried out on the buccal aspect of the sites at 2-4-6 mm from the gingival margin. Fibre Optics Reflectance Spectrometry technique has been applied to objectively determine colour of peri-implant mucosa, employing a portable spectrophotometer and a standard light source connected with a co-axial fibre optics probe. To analyse and quantify colour differences, a colorimetric space has been provided by the Commission Internationale de l'Eclairage (CIE space), where three coordinates are used to univocally identify a specific colour: a coordinate (yellow-blue variation), b (red-green variation) and L (white-black variation). Delta E value was considered to analyze colorimetric difference.

Results. We analyzed 17 sites from 13 patients who had already received Straumann implants in aesthetic area. Data showed a statistically significant difference in colour properties in all sites, comparing peri-implant and tooth mucosa. White-black variation mainly affected the colour difference, that was higher at 2 mm from gingival margin and lower at 6 mm. Colour difference was statistically lower at 4mm and 6 mm using Bone Level implants.

Conclusions. Colour of soft tissue around implants was significantly different if compared to gingiva of natural teeth. Bone Level implants seemed to improve aesthetic integration.

Council for Research on Osteonecrosis of Maxillary and Mandibular bone (CROMa): report on two years of activity

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Aim. Bisphosphonates (BPs) are used in metabolic and oncologic skeletal diseases therapy. An avascular osteonecrosis of the jaws (B-ONJ) has been recently reported as adverse effect to intravenous or prolonged BPs oral administration, particularly induced by jaws/teeth pathological/anatomical conditions.

Methods. A task-force of clinicians set up the Council for Research on Osteonecrosis of Maxillary and Mandibular bone (CROMa), with the aim to prevent or treat B-ONJ in patients with past, present or planned BPs-exposure. Medical and clinical data were collected and class-risk focused EB guidelines were followed. Preventive, operative and a-traumatic dental extractive treatment were given in order to prevent or remove odontogenic foci, being actual or potential infection sites. Patients with B-ONJ were treated with an integrated approach including Low-Level Laser or Ozone bio-stimulation. Piezosurgery® and Platelet-Rich Plasma (PRP) were applied for the surgical approach.

Results and conclusions. - 220 patients with past, current, or planned BPs therapy were examined. No new B-ONJ onset occurred during 13±8 months of observation and treatment. All patients treated for B-ONJ showed mucosal healing and symptoms disappearance at 15±6 months follow-up. A dental multitasking team has proven to be a winning strategy in providing a comprehensive patient-centered oral care delivery in BPs protocols.

Custom tray for topical corticosteroid treatment of gingival atrophic-erosive lichen planus

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Aim. Topical corticosteroid application is often not much effective in the gingival atrophic-erosive lichen planus (GAELP), because of salivary washout. Contact of lip reduces also the action in an adhesive base preparation. We propose use of a custom tray to increase the therapeutic action of medication.

Methods. On ten patients (test group) with recalcitrant GAELP a custom tray was realized to improve the lesions symptoms. Systematic examinations at 1, 2, 3 weeks were performed by gathering data on lesions status. A GAELP control group of ten patients with usual management were observed. Clobetasol propionate at 0.05% was used on both groups.

Results. Clinical and symptomatic improving was quantifiable in test group in comparison with control group.

Conclusions. Custom tray may lead to the strengthening of the therapeutic action of medication in GAELP patients with a reduction of application period.

Diabetes and oral diseases. Trends after 20 years

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Aim. Poorly controlled diabetes is frequently associated with oral diseases. The susceptibility of diabetic patients to develop periodontal infection is essentially due to two factors: the weakening of oral defences against microflora and the high blood glycemia level. The aim of the present study was to evaluate the oral health status in paediatric diabetic patients. The same patients were examined 20 years ago so the paper is aimed to calculate the trend of oral conditions.

Methods. In 1991, 117 diabetic patients were examined; in 2010 the same patients were re-examined. 94 subjects, (49 females and 45 males) of the 117 were re-examined. The some criteria used in 1991 were used: carious disease was evaluated through DMFT(S)/dmft(s). The bleeding on probing was defined positive, if the site bleeds not more than 20 seconds after removal of the periodontal probe.

Results and conclusions. Compared to the previous survey, carious disease considerably decreased. The difference between the two cohorts of this study is not statically significant about the recorded gingival problems (healthy gums, bleeding on probing, presence of calculus).

Differential distribution of cAMP-dependent protein kinase regulatory subunits in a case of squamocellular oral cancer

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Aim. Intracellular signalling pathways are often dysregulated in cancer. The cAMP-dependent protein kinase (PKA) pathway contributes to carcinogenesis in different types of tumour. Here we show that PKA subunits are differentially distributed in a case of oral cancer.

Methods. A biopsy was obtained from a female patient, age 70, bearing a squamocellular oral cancer (grading: G2 - staging: pT2 pN0) that infiltrated the jaw. Surgical resection permitted a good healing without any oncologic therapy. Immunohistochemistry was performed to reveal the RI and RII regulatory subunits of PKA.

Results. The PKA regulatory subunits were present in the cytoplasm of different cells. RI was detected in perinuclear aggregates. RII was detected in some cells as small dots; some of the tumour blood vessels were heavily stained.

Conclusions. Similarly to other tumours, the present data support the notion that PKA may be a useful target for diagnosis, due to its differential distribution in the tumour tissue.

Evaluate the effectiveness in vivo of two support therapies : pool of aminoacids combined to sodium hyaluronate and vitamin E

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Aim. To evaluate the effectiveness in vivo of two support therapies (pool of aminoacids combined to sodium hyaluronate and vitamin E) in reduction of both pain and ulcers' dimensions pain in erosive oral Lichen planus and liver complaint (HCV) patients.

Methods. 22 patients homogeneous for age, sex and maximum diameter of lesions have been followed for 12 months and subdivided into 2 groups. the first group has been was treated using topic cortisone in association with a pool of aminoacids combined to sodium hyaluronate (Aminogam®), the other one has been treated using topic cortisone in association with vitamin E (Vea®oil). The evaluations on the two groups have been done after 7 and 15 days from the beginning of therapy.

Results. Both groups exposed to cortisone and Aminogam® and cortisone and Vea® oil, have shown a drop of pain and a reduction of ulcers' diameter after 7 days and 15 days of observation. However the group treated with cortisone and Aminogam® have shown a more significant reduction of pain and lesions respect the other group.

Conclusions. This study demonstrates that Aminogam® gel and Vea® oil could be used like a support therapy for the treatment of ulcerative lesions in erosive oral lichen planus and liver complaint (HCV) patients. Particularly Aminogam® has shown to be a precious ally to heal oral ulcers.

Extranodal marginal zone lymphoma of MALT in lower lip: diagnostic approach of unusual

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Aim. To describe the diagnostic implications of a rare case of MALT lymphoma of the lower lip in an adolescent patient. Material and

Methods. A 16-years-old presenting with a symptomatic mass of the left lower lip visited our Department, complaining about pain associated with biting and physical stimuli. An excisional biopsy of the lip mass was performed under the tentative diagnosis of mucocele.

Results. Microscopically, dense atypical lymphoid cells infiltration with severe destruction of adjacent normal salivary glands was present, with various reactive germinal centres with different size. Immunohistochemical staining demonstrated positivity for CD20, CD79a, and Bcl-2 and negativity for CD3, CD5 and cyclin D1. Cytoplasmatic positivity of the kappa chains was observed and Ki-67 expression was 10%. The final diagnosis was a MALT-type extranodal marginal zone lymphoma.

Conclusions. Dentist should consider MALT lymphoma in differential diagnosis with mucocele of the lip, especially in adolescent patients.

Genomic alterations in fields of oral precancer

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Aim. “Field cancerization” is an accepted model in oral carcinogenesis. Genetically altered fields have been just reported in presence of carcinoma. This study assessed the distant mirror fields of oral precancer by high-resolution DNA-content flow cytometry (hr DNA-FCM) and high-resolution oligonucleotide array-Comparative Genomic Hybridization (a-CGH). Methods 14 leukoplakias: 5 non dysplastic (OLs), 9 dysplastic (DOLs) and 14 corresponding visually healthy mirror fields (MFs) were analyzed. DNA-aneuploidy was detected by hr DNA-FCM. DNA aneuploid and diploid nuclei were FCM-sorted to obtain genomic DNA for a-CGH (105K microarray using an Agilent platform).

Results. MFs (7.1%), OLs (20%) and DOLs (66.7%) showed an increasing prevalence of DNA-aneuploidy. DNA-aneuploid sublines were mainly near-diploid in MFs/OLs, high-aneuploid in DOLs. The average number of chromosome aberrations (Ch-Ab) was 3.1 in MFs, 3 in OLs, 11.9 in DOLs. Dysplasia implied an higher mean number of Ch-Ab in MFs (from 1.8 to 3.8). Ch-Ab were also observed in DNA-diploid sublines. Often both OLs/DOLs and corresponding MFs had the same Ch-Ab.

Conclusions. DNA-aneuploidy (7.1%) and Ch-Ab (57.1%) in MFs indicate an early onset of field effect in oral carcinogenesis. Founding Philip Morris International, “Compagnia di San Paolo - Programma Oncologia” to WG. MURST ex-60% “Università di Torino”, “Ricerca Sanitaria Finalizzata Regione Piemonte”, “Compagnia di San Paolo - Programma Oncologia” to SG.

Growth pattern of oral cancer trauma related: histopathological observations

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Aim. Chronic trauma of the oral mucosa (CTOM) is the result of repeated mechanical irritative action of an intraoral injury agent, who may potentially induce oral squamous cell carcinoma (OSCC). We attempt to describe the evolution pattern of OSCC-CTOM related, through its histopathological features. Material and

Methods. Following fixation, the samples of 6 OSCC-CTOM related patients were cut transversally to obtain serial sections of all the macroscopically visible lesions. The samples were routine processed, embedded in paraffin, sectioned and stained with haematoxylin and eosin.

Results. Histologically, the exophytic lesions are highly keratinized verrucous carcinomas that exhibit varying degrees of cell atypia. Increased mitotic index is constantly present associated with a well differentiated growth pattern.

Conclusions. Among the histopathological parameters, keratinization, pattern of invasion and inflammation are considered important for prognosis. Findings here reported add indications on OSCC-CTOM behaviour.

High frequency of HR HPV in patients with oropharyngeal Squamous Cell Carcinoma. First findings for South-Italian population

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Aim. According to recent evidence, a subset of Head and Neck Squamous Cell Carcinoma, especially oropharyngeal SCC, has an HPV-related model of aetiopathogenesis independent from that associated with the most common risk factors (smoking and alcohol drinking). The viral aetiology of this malignancy has been suggested by the high frequency (about 60%) of High Risk HPV DNA in oropharyngeal SCC. To estimate the HPV DNA frequency in Sicilian patients with SCC of oropharynx (tonsil and base of tongue) and rynopharynx consecutively diagnosed at the sections of Otorhinolaryngology and Oral Medicine – AOUP of Palermo from Jan 2009 to Dec 2010.

Methods. HPV DNA was detected in formaline-fixed paraffine-embedded biopsies from 13 patients with histological diagnosis of SCC of oropharynx (4 F and 9 M, average age 62yy ± 11yy) and from 13 with SCC of rynopharynx (2F and 11 M, average age 54yy ± 14yy). HPV DNA was detected by the use of nested PCR amplification followed by direct DNA sequencing and the commercial assay INNOLiPA HPV Genotyping (Innogenetics N.V., Ghent, Belgium).

Results. HPV DNA was detected in 46,1% (6/13) of oropharyngeal CSS and 0% of rynopharyngeal SCC. All HPVs identified were HR types, the most frequent was HPV 16.

Conclusions. The results of the present study, although in a small sample size, confirm a significantly higher frequency of HR HPV infection in base of tongue and tonsillar SCC than other HNSCC, also in Mediterranean population.

HIV+ patients: prevalence of oral lesions related to CD4 cell count and HAART therapy. A study in north east Italy

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Aim. HIV infection is associated with oral lesions. With the advent of Highly Active Anti-retroviral Therapy (HAART) the incidence of oral lesions HIV related has decreased. Opportunistic infections are associated with reduced CD4+ cell count. Aim of the study was to determine the prevalence of oral lesions in HIV+ patients and to verify the association between lesions, HAART and CD4. MATERIALS AND

Methods. We followed HIV+ people to find out if oral lesions, periodontal disease and DMFT index (decayed, missing and filled teeth) could be related to CD4+ count and to HAART. We evaluated oral lesions, DMFT, periodontal charting, took photos and X-rays.

Results. 35% of patients were affected by periodontal disease but only 11% of all patients showed low CD4+ (<400 cell/uL). Almost 26% patients weren't in HAART at the first visit: some had developed leukoplakia, candidiasis, warts and acute necrotizing ulcerative gingivitis; analyzing the CD4+ count, some of them needed to start HAART. In "HAART patients" we found lesions as HSV1, leukoplakia and warts; some of them needed to correct HAART after checking CD4+. The onset of these oral lesions could suggest a drop of the CD4+ cell count, so a modulation of HAART could be needed.

Conclusions. Oral health care is important for monitoring HAART and the progression of the HIV. Collaboration between the infectious department and the oral pathologist is basic to follow successfully HIV+ patients with a multidisciplinary approach.

HPV detection and genotyping in the oral mucosa of a cohort of HIV+ individuals

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Aim. Human papilloma virus(HPV) infection is involved in the pathogenesis of different epithelial cancers, including of cervical, anal, penile, oropharyngeal and oral neoplasms. The frequency HPV detection in anal and oral cancers is increasing, particularly among immunocompromised individuals, especially if positive for human immunodeficiency virus (HIV). To investigate the prevalence and distribution of HPV genotypes in oral mucosa (healthy or with lesions) in a cohort of patients, and to analyze the associations between HPV infection and history of HIV infection.

Methods. The study cohort include 207 HIV+ patients (67 female, 140 male). We recorded length of HIV infection and risk factors, type and duration of HAART, CD4 count, viral load, presence of lesions affecting the oral mucosa. All patients underwent oral scraping and all specimens obtained went through cytological examination. HPV presence and genotyping was performed by PCR. CD8+ CD38+ T cells were measured by flow cytometry. Logistic regression was used to explore possible risk factors for dysplasia and for HR oncogenic HPV genotypes.

Results. The study group comprised 207 patients, with a mean age of 42 years (range 24-61). HPV infection was detected in the oral cavity of approximately 20% (41/207) of them. The most common HPV genotype was HPV-6 and HPV-16. Among other genotypes we isolated putative HPV genotype SIBX3. The subjects with HPV infection in oral cavity were 12/67 female and 29/140 male.

Conclusions. These data confirm the high frequency of HPV presence in the oral mucosa of HIV+ subjects with and without HPV-related oral lesions.

Immunohistochemical expression of p16INK4A protein in Oral lichen planus

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Aim. While p16INK4A expression has been widely investigated in oral leukoplakias (LEUK), no data are available about oral lichen planus (OL). The aim of the present study was to compare the immunohistochemical expression of p16INK4A in OL with that of LEUK, and to investigate the relationship between p16INK4A pattern and tissue inflammation.

Methods. 129 cases were subdivided as follows: 56 OL; 36 LEUK (12 without any sign of chronic inflammation, and 24 with significant signs of chronic inflammation); 23 cases considered as non-specific inflammations (NSI), and 14 samples as controls. Cases showing >5% of positive cells were defined as 'positive'.

Results. All control cases were negative. Positive p16INK4A expression was detected in 36 (64%) OL, in 10 (28%) LEUK (all cases were found among the 24 leukoplakias with evident signs of inflammation), and in 10 (43%) NSI. A statistically significant difference in the p16INK4A expression was found between OL and LEUK (Chi square 17.7; $p < 0.01$), and between LEUK with evident signs of inflammation and LEUK without signs of inflammation (Chi square 4.5; $p < 0.05$). No statistically significant differences were found between OL and NSI and LEUK with significant features of chronic inflammation.

Conclusions. a positive p16INK4A in OL patients may be uninformative about the risk of progression to OSCC, while it might be the consequence of tissue inflammation.

Immunological profile of patients with bullous pemphigoid in clinical remission

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Aim. Bullous pemphigoid is a chronic autoimmune sub-epidermal blistering disease of the skin and oral mucosa that mainly affects the elderly.

Methods. A PUBMED search was conducted on the role of BP180 and BP230 auto-antibodies as detected by different serological assays.

Results. Nine reports containing data on 143 patients were analyzed. Pre-treatment data showed that indirect immunofluorescence (IIF), enzyme-linked immunosorbent assay (ELISA) and immunoblotting (IB) offer an 82.2% or greater probability of being positive. At the end of the study period, all patients had clinically improved, whether or not they were on therapy. Auto-antibodies were present in 29% of patients evaluated by monkey esophagus IF and 75% of those evaluated by human skin IF. Positive titers were also reported in 67.6% of patients evaluated by ELISA. In 100% of patients in whom IB was performed the titers became negative. In 3 patients (5.3%) using human skin immunofluorescence and in one patient (1.4%) using ELISA the titers were increased at the end of the study period.

Conclusions. the review demonstrates that the literature is significantly deficient in relevant information. If the authors provided more detailed and complete clinical and serological data and provided a minimum of 2 to 5 years of follow-up, such data would have more value to the practicing clinicians in the use of these tests and in the information they could provide their patients.

In vivo evaluation of oral and periodontal microcirculation in diabetics

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Aim. Diabetes mellitus, a systemic chronic disease considered an “epidemic” and a “social disease” by the World Health Organization (WHO), causes pathological peripheral microvascular changes. The in-vivo evaluation of changes in microcirculation could be useful for early diagnosis and monitoring of vascular damage. The aim of this study is to evaluate in-vivo the effects of type II diabetes mellitus on the microcirculation of oral and periodontal mucosa.

Methods. 80 subjects, 40 patients with type II diabetes mellitus (18 men, 22 women; age: Mean±SD: 63,82±11,13years; range, 44-85 years) and 40 healthy subjects (17 men, 23 women; age: Mean±SD: 64,51±11,32 years; range, 44-78 years) were examined. Oral microcirculation was evaluated on labial and gingival mucosa by mean of oral video-capillaroscopy, a noninvasive diagnostic method.

Results. Capillary density on labial and gingival mucosa, total loop length and total loop diameter resulted significantly altered in diabetics. The density of loops, observed on labial mucosa, is lower in diabetics than in healthy patients. On the contrary there is an increase in periodontal loops density. The length and total diameter of loops are increased in diabetics.

Conclusions. This study shows the capillary alterations that occur in the oral mucosa of diabetics. The loop density decrease is a symptom of peripheral microangiopathy. The loop density increase in periodontal mucosa is related to inflammatory angiogenesis.

Interaction between retinoids and PKA signal transduction on mitochondrial respiratory complex I activity and level in human keratinocytes

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A study of interactions between all-trans retinoic acid (ATRA) and cAMP-PKA pathways on biogenesis and activity of complex I of the mitochondrial respiratory chain in normal human keratinocytes (NHEK) has been carried out. In NHEK cells ATRA treatment resulted in growth suppression, significant increase in the level of GRIM-19 protein, enhanced content of complex I but depressed activity of NADH-UQ oxidoreductase activity of the complex. Under these conditions the induction of cAMP-PKA signaling, by dibutyl cyclic AMP or okadaic acid, restores complex I activity. These results indicate an interplay between ATRA and PKA signal transduction on regulation of cellular bioenergetics.

Ki67 from clinically and histologically “normal” distant mucosa as a prognostic marker in early stage (T1-2 N0) oral squamous cell carcinoma: a prospective study

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Aim. Early T1-T2 OSCCs are associated with a good prognosis, but a certain percentage of them may be complicated by locoregional metastases. The aim of the study was to see whether an abnormal proliferative status in clinically and histologically “normal” mucosa situated in distant areas may be associated with a poor prognosis.

Methods. The prospective study included 42 consecutive patients with T1N0M0 (19) and T2N0M0 (23) OSCCs. Ki67 expression was evaluated in each patient in the clinically “normal” mucosa located in the cheek opposite the OSCC and high Ki67 expression was established when more than 20% of cells were stained.

Results. The mean Ki67 value ($17.6 \pm 8.2\%$) in the distant mucosa was statistically higher ($F=13.87$; $p<.01$) than that found in controls (9.8 ± 3.1), and “abnormally high” Ki67 values were detected in 13 (30%) OSCC patients. During follow up, 4 patients had local recurrence or lymph-node metastasis. A significant difference (chi square 11.9; $p<.01$) in the survival rate was found between the group of patients with low Ki67 values from distant mucosa ($Ki67<20\%$) and those with high values ($Ki67>20\%$): 28 patients out of 29 with low Ki67 values were disease-free compared to 10 patients out of 13 with high Ki67 values.

Conclusions. A certain percentage of patients surgically treated for early T1-T2 OSCC have an abnormal proliferative status in areas very distant from the primary tumour, that seems to be related to a poor prognosis.

Localized hyperplasia as an answer to the plaque chronic inflammation on the oral mucosa: a surgical treatment

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Aim. The connective tissue hyperplasias that originate from the gum are common and appear as localized swelling. Most originate from the interdental tissues and has as main etiological factors the trauma and the chronic irritation caused mainly by the subgingival plaque and the calculus. In this work we present a case of inflammatory calculus hyperplasia, treated with conservative surgery in collaboration with the dental hygienist.

Methods. For the present study a clinical case of inflammatory calculus hyperplasia on the oral mucosa was selected. The patient (male sex, aged 52) came to our observation complaining a painful sensation during the brushing maneuvers. At the clinical examination an inflammatory hyperplasia of the interdental gingiva between the two inferior central incisors was diagnosed. The patient did not attend professional hygiene appointments for approximately 2 years. So after motivating the patient to the oral hygiene, the surgical operation was planned. After performing a thorough professional hygiene, the oral hyperplasia was surgically removed in local anesthesia.

Results. The healing at 7 days and at 30 days was satisfactory and the patient compliance was compatible with the desired results.

Conclusions. The patient treatment through this conservative surgical technique performed in the same step with the professional hygiene under local anesthesia has given excellent healing results and favored patient's compliance.

Low Level Laser Therapy in the treatment of Oral Mucositis induced by cancer therapy

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Aim. Oral Mucositis (OM) is one of the most frequent side effects of cancer therapy. It can be so debilitating that it can lead to abandon of therapy. It occurs in almost 100% of patients treated with radiotherapy and in 30 to 70 % of those treated with chemotherapy. OM occurs as ulcers, erythema and pain all over the mouth preventing patients from swallowing, eating and speaking thus affecting patients' quality of life. It usually appears after 5 to 7 days after the beginning of therapy. The purpose of our study was to evaluate the effect of Low Level Laser Therapy (LLLT) as therapeutic regimen for OM induced by chemotherapy, radiotherapy or both of them.

Methods. We treated 50 patients presenting OM due to cancer therapy by LLLT. Laser parameters were: WL=970nm, P=4W, D=600J, Delta(t)=5min, HZ:35-6000. Laser sessions were 4 a week on consecutive days and they were followed by a 3-week-period follow up. During each day of active treatment and in each follow-up recall, for a total of 7 sessions, patients were asked to fill in a questionnaire about the onset and progression of OM. Also Visual Analogue Scale (VAS) for pain and Common Toxicity Criteria (CTC) for grade of OM were taken note of every day.

Results. All patients showed a significant decrease in dimension of lesions, VAS and CTC. They improved their capacity of swallowing, chewing and talking.

Conclusions. The results suggest that LLLT had a positive effect in managing OM severity with no side effects.

Management of Acneiform Rash due to AGFR inhibitors: Low Level Laser Therapy as a new approach

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Aim. Acneiform Rash (AR) associated with epidermal growth factor receptor (EGFR) inhibitors often presents as a facial manifestation. Treatment modality for such lesions still needs to be investigated. Aim of this case series was to evaluate the effectiveness of Low Level Laser Therapy (LLLT) in reducing the severity of acneiform facial rash induced by Cetuximab, an EGFR inhibitor.

Methods. 3 patients with metastatic colorectal cancer and 2 patients with head and neck cancer showing Cetuximab-induced AR, were treated by LLLT (WL 970 nm, P 5.0 W, DC 50%, F 10-1000 HZ) in two 8-min-long consecutive sessions/day over 4 days. Patients wore protective glasses to prevent eye damage and the skin area under the glasses, not irradiated, was thus taken as a control. Subsequently, patients were seen weekly for a 3-week period follow-up. During each day of active treatment and in each follow-up recall, for a total of 7 sessions, patients were asked to fill in a questionnaire about the onset and progression of AR. Cetuximab-Related Toxicity (CRT) and general discomfort visual analogue (VA) scales were recorded in each session in treated and control areas in each patient.

Results. Immediately after LLLT, patients showed a decrease in both CRT and VA scales, up to a complete regression of the lesions during the follow-up term in treated areas.

Conclusions. LLLT is effective in the healing of acneiform rash associated with EGFR inhibitors with no apparent side effects.

Management of oral leukoplakia: a retrospective study

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Aim. This work is a retrospective study evaluating the most appropriate management of oral leukoplakias, based on our clinical experience between 2008 to 2010. MATERIALS AND

Methods. Among 126 patients affected by oral white lesions, 33 subject with leucoplakia were identified by a histological examination. The patients were approached either surgically, removing entirely the lesion by scalpel or KTP laser (excision or vaporization), or with a “wait and see” approach, depending on clinical and istopathological features.

Results. Excised leukoplakias showed a complete regression in the 87,5% of cases, instead the 12,5% of the lesions had a partial remission. Vaporized lesions showed a complete regression in the 43% of cases, instead in the 57% of cases a partial resolution was observed. The cessation of risk activities contributed to the complete resolution in only 21% of the lesions.

Conclusions. On the basis of these results and regarding the last literature, we think that the most appropriate management is the surgery. However, when it is impossible to remove entirely the lesion or when it recurs, a strict follow-up is recommended. Key words: oral leukoplakia; surgical treatment; laser vaporization; wait and see.

Mandible brown tumor caused by Primary hyperparathyroidism

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Brown tumour is a uni or multi-focal bone lesion, which represents the terminal stage of the hyperparathyroidism-dependent bone pathology. It often appears as an expansive osteolytic lesion of the bone, commonly in the mandible, ribs, pelvis and femur. A 56 year-old male patient presented with an asymptomatic unilocular radiolucent lesion of the right mandible without teeth. The lesion had a diameter of about 3 cm, had sharply delimited margins and was surrounded by an osteosclerotic rim. Under local anesthesia, the lesion was extracted surgically. The microscopic diagnosis was brown tumor of the mandible. The following report describe a patient with secondary hyperparathyroidism who developed a brown tumor of the mandible, discuss the differential diagnosis, and review the literature.

Mucocutaneous vascular lesions treatment with diode laser in Sturge Weber syndrome (SWS): case report

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Aim. SWS is a genetically determined disease, connected with the RASA1. Multiple mucocutaneous vascular malformations of the encephalon-trigeminal neuromeres characterize the disease. At present in literature, the diode laser efficacy in the non-invasive treatment of angiomatous lesions in SWS, is still considered in a pioneering way.

Methods. we report a 31 years old patient suffering from a complete and wide SWS, with multiple vascular, nodular mucocutaneous lesions, grape red colored, such as to disfigure the right part of the face. The patient has been treated in 3 consecutive sessions, with gallium arsenide diode laser in pulsed mode (on 190-250 ms/off 250-450 ms), with a power range from 14 to 24 W and wavelength of 800 nm. The laser application was preceded by cooling of the treated site, using cold packs, to avoid the tissue damage.

Results. after every single treatment, we have noticed a definite improvement of the angiomatous lesions (labial, gingival and cutaneous lesions), with a slight post-operative pain and edema.

Conclusions. the diode laser, used in pulsed mode and for consecutive sessions, has been proved to be very effective as non-invasive treatment of the oral and perioral vascular malformations, for the SWS patients.

Myofibroma of the jaw: a case report

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Myofibroma (MF) is a rare benign nodular tumor of soft tissues, bones, or internal organs, and may affect both children and adults. The solitary adult myofibroma shows a predilection for the subcutaneous tissue in head and neck region. Intraosseous lesions are more often found in childhood. Radiographically, it may appear as a well-defined unilocular radiolucent solitary lesion located solely in the mandible, simulating cystic or odontogenic lesion. Careful differential diagnosis need to be carried out at both clinical, imaging and histopathologic level since it may have overlapping features with more aggressive spindle cell tumours. The present paper discusses clinical, radiological, and histopathologic features of a 41-year-old female affected by a solitary myofibroma of the jaw.

Nicotinamide N-Methyltransferase as effective diagnostic tool and promising therapeutic target for oral cancer

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Aim. The enzyme Nicotinamide N-Methyltransferase (NNMT) catalyses the N-methylation of nicotinamide, pyridines and other structural analogs and its upregulation has been associated with several tumours.

Methods. In this report, we examined NNMT expression in oral squamous cell carcinoma (OSCC) and evaluated the effect of shRNA-mediated inhibition of NNMT on the proliferative potential of an oral cancer cell line.

Results. A significant increase of NNMT expression was detected in most of the favourable OSCCs, while no marked NNMT expression alteration between tumour and normal mucosa was found in most of metastatic tissues. shRNA-mediated knockdown of NNMT inhibited cell proliferation and decreased colony formation ability on soft agar. In athymic mice, NNMT silencing induced a drastic reduction in tumour volume.

Conclusions. The present data support the hypothesis that NNMT plays a role in oral carcinogenesis and its inhibition could represent a possible molecular approach to the treatment of oral cancer.

Non-bisphosphonates associated osteonecrosis of the jaws: etiology, diagnosis and treatment

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Osteonecrosis of the jaw (ONJ), also known as “Dead Jaw Syndrome”, “Avascular Necrosis” and “Aseptic Necrosis”, is a severe bone disease that affects the jaws, including the maxilla and the mandible. Damage and death to areas of jaw bone occurs as a result of reduced local blood supply. ONJ sometimes appears when the jaw does not heal after minor trauma, such as a tooth extraction in which bone is left exposed. However, there are several risk factors that may increase the evenience of developing ONJ. These include: radiation therapy (head or neck), chemotherapy, chemical agents using in dental treatment, treatment with steroids, anemia and other blood-related disorders, infections, gum disease or dental surgery, alcohol abuse, cancer (multiple myeloma or metastatic disease to bone). Lesions are more common on the mandible than the maxilla. There are a variety of osteonecrosis of the jaw symptoms: ONJ is asymptomatic throughout the early stages of disease's development. Symptoms of ONJ include: pain, swelling or infection of the gums or jaw, loose teeth, drainage of jaw abscesses, exposed bone showing through missing gum tissue. X-rays can reveal osteonecrosis of the jaw, where area of osteolysis can be visualized. Currently, treatments to control the condition and alleviate and/or stop ONJ symptoms include antibiotics, chlorhexidine mouth rinses and removable mouth appliances. Later intervention may be necessary to remove injured tissue and reduce sharp edges of damaged bone.

Odontogenic fibroma and intraosseous hemangioma associated with Tuberous Sclerosis. A case report and review of the literature

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Tuberous sclerosis (TS), also called Bourneville-Pringle syndrome, is an autosomal dominant neurocutaneous syndrome which affects multiple organ systems and demonstrates highly variable clinical manifestations. Oral manifestations are not infrequent, with a prevalence of 11%, but relatively uncommon oral manifestations are intraosseous lesions of the jaws. The purpose of this paper is to report a case of odontogenic maxillary fibroma and of intraosseous mandibular hemangioma in a female 60-year-old with tuberous sclerosis, and to review the previous reports of intraosseous lesions of the jaws associated with the syndrome. In agreement with other authors, it is possible to state that the fibrous intraosseous lesions of the jaws could represent a manifestation of tuberous sclerosis rather than a coincidental finding, so that radiographic studies of the jaws should be a part of the diagnostic evaluation of any patient suspected of having tuberous sclerosis.

Oral characteristics in patients with Rett Syndrome

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The Rett Syndrome is a progressive neurological developmental disorder caused by a mutation on the X chromosome. Its incidence rate is 1 per 10.000-15.000 people. Patients affected by this disease appear to make normal progress until 6-18 months and then gradually lose speech skills and voluntary hand movement. The dentist in charge should be familiar with disease manifestations and oral characteristics (dental injuries, bruxism, masseter hypertrophy, ptyalism, dental class II due to manual suction, high-arched palate, open bite, gingivitis) as well as medications required to treat associated effects. Many of those may cause clinically evident orofacial or systemic reactions and may lead to interactions with dental medications. Our study analysed the incidence rate and the oral characteristics of a group of patients.

Oral piercing complications

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Aim. Body piercing indicates the puncturing of a part of the body in which jewelry may be worn. In the last years, oral piercing has particularly spread especially among young people. Body piercing has to be considered as a surgical procedure to all intents and purposes and, as such, has to be performed only by qualified personnel. The aim of the present work is to verify which risks patients are concretely exposed to and which complications may occur after an healthcare professional performs oral piercing.

Methods. The present study includes one hundred and eight patients (74 males and 34 females) aged between 14 and 39 years, who presented with oral piercing done 12±4 months earlier. After initial counseling, patient medical history was analyzed to identify useful information that could reveal the onset of intraoperative and postoperative complications. Finally, the patients underwent clinical examination to reveal the possible presence of late complications.

Results. After piercing, neither of the 108 patients developed widespread complications. Although all patients said they had followed the piercer's indications, 96% of them reported postoperative local complications such as bleeding within 12 hours of piercing (90%), perilesional edema for 3±2 days after piercing surgery (80%), persistent mucosal atrophy (70%), enamel abrasions (30%), enamel fractures (30%), gingival recession (25%), erythematous palatal mucosa (15%), dentine hypersensitivity (15%).

Discussion and conclusion. The analysis of results shows that the area that most of the recruited patients prefer to pierce is the tongue: this seems to be in agreement with the recent literature. In fact, it is important to underline that this area is at highest risk for hemorrhagic complications, because of the extensive vascularization in the tongue. In our study, no systemic complications were identified. However, it seems very important to underline that body piercing should always be done by medical staff in a clean room. As a matter of fact, it is clear that the risk of systemic complications is significantly higher when body piercing is done by untrained personnel without sanitary inspections.

Oral Verruciform Xanthoma: a case report

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Aim. Verruciform Xanthoma (VX) is an uncommon oral mucosal benign lesion of unknown etiology and pathogenesis, although some studies showed to be of inflammatory origin.

Methods. A male, 48 years old patient referred to our dental unit for a whitish plaque on the gingival, with irregular margins, in relief on the mucosal plane, about 2.5 cm in major axis, roughly elliptical, placed between the disto-buccal edge of tooth 3.7 and the distal face of tooth 3.8. The lesion presented a corrugated surface, which was non-removable. The lesion had an hard-elastic consistency, was painless and remained still on the underlying tissues. Palpation didn't reveal any involvement of regional lymph nodes.

Results. Since the lesion, did not regress after 15 days without smoking, the subsequent step was an excisional biopsy, together with the extraction of tooth 3.8. The histopathological analysis of the specimen led to a diagnosis of VX. Then the patient was scheduled for follow-up visits. After two weeks the condition of the area was optimal. After 3 months he was totally restored to health.

Conclusions. The treatment of choice for oral VX is total excision biopsy, with excellent results.

Peculiar Chromosomal Instability in Oral Verrucous Carcinoma

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Aim. Oral verrucous carcinomas (OVCs) show better prognosis than oral squamous cell carcinomas (OSCCs). Since chromosomal instability (CIN) is indicative of prognosis, we investigated whether OVCs and OSCCs were characterized by differences in CIN biomarkers.

Methods. Fresh/frozen multiple tissue samples were submitted to high-resolution DNA-content flow cytometry (hr DNA-FCM) to provide the DNA index values (DI).

Results. DNA-aneuploid sublines were detected in 6/9 OVCs (66.7%) and in 20/25 OSCCs (80.0%). Multiple DNA-aneuploid sublines were observed respectively in 2/6 (33.3%) DNA-aneuploid OVCs and in 14/20 (70%) DNA-aneuploid OSCCs ($p=0.163$). DNA near-diploid ($DI \neq 1$ and $DI < 1.4$) and high-aneuploid ($DI \geq 1.4$) sublines were respectively 87.5% and 12.5% for OVCs versus 30% and 70% for OSCCs ($p=0.004$).

Conclusions. The present data suggest that OVCs are characterized by a lower degree of CIN and tumor heterogeneity such that they appear as “frozen” in an early stage of DNA near-diploid aneuploidy, as previously observed for oral preneoplastic lesions. These DI characteristics appear to reflect the well-known differences in aggressiveness and prognosis of OVCs and OSCCs.

Founding Philip Morris International, “Compagnia di San Paolo - Programma Oncologia” to WG. MURST ex-60% “Università di Torino”, “Ricerca Sanitaria Finalizzata Regione Piemonte”, “Compagnia di San Paolo - Programma Oncologia” to SG.

Peripheral ossifying fibroma: a clinicopathologic study of 27 cases

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Aim. The peripheral ossifying fibroma (POF) is a reactive gingival overgrowth usually composed by cellular fibroblastic tissue containing one or more mineralized tissue, namely bone, cementum-like material or dystrophic calcification. The purpose of our study was to report the clinicopathologic features of a single Italian institution case series of POF.

Methods. A total of 27 cases were collected from the archives of the Section of Odontostomatology at University Hospital of Parma over a 18-year period. Detailed anamnestic, clinical and histologic information was recorded for each patient.

Results. The age range of patients (6 M and 21 F) was 17,2 to 80,1 years with a mean of $42,9 \pm 18,1$ years. Occurrence of the lesion in the mandibular and maxillary arches was similar and 67,0% occurred in the incisor-cuspid region. The lesions ranged in size from 0,3 to 5,0 cm (mean $1,3 \pm 1,1$ cm). All the different types of mineralization were present, with higher prevalence of lamellar bone. The lesions were treated by surgical excision and 4 lesions in three patients recurred after surgery.

Conclusions. Surgeon should consider the high recurrence rate of POF and remove the lesion down to bone involving also the adjacent periostium and the periodontal ligament. In our experience the use of techniques different from traditional surgery with cold blade, such as Nd:YAG laser and quantic molecular resonance scalpel could add some advantages.

Prevention and treatment of BRONJ in oncological patients

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Aim. The aim of this study is to present the results in the prevention and treatment of osteonecrosis of the jaw (ONJ) in cancer patients that underwent or will undergo treatment with intravenous bisphosphonates.

Methods. The review refers to cases from the ambulatory for patients treated with bisphosphonates at the operating unit of Maxillofacial Surgery, Magna Graecia University in Catanzaro. The patient data were tabulated using a form created expressly for the task. Of the 92 patients observed, 68 had different stages between 1 and 3 of BRONJ (AAOMS classification) and 24 waiting to start the intravenous bisphosphonates drug therapy or with stage 0.

Results. Patients with ONJ were treated with medical therapy, piezosurgery debridement, sequestrectomy. Patients with stage 0 were included in a monthly follow-up program. To patients waiting to start the bisphosphonates drug therapy, preventive measures aimed at rehabilitation of the oral cavity and the elimination of risk factors were applied.

Conclusions. Given the high incidence of BRONJ in cancer patients treated with bisphosphonates it is recommended the application of preventive measures to eliminate potential risk factors in patients about to begin therapy with these drugs. In patients with ONJ, conservative surgical treatment is recommended if a remission of the disease is not observed clinically and/or radiologically. The piezo-surgery was effective only in reducing symptoms due to superinfection of the lesion.

Prevention and treatment of BRONJ in osteoporotic patients with oral bisphosphonate therapy

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Aim.The aim of this study is to present the results obtained in the prevention and treatment of osteoporotic patients in therapy with oral bisphosphonate with laboratory diagnosis of seric CTX. PATIENTS AND

Methods.Patients undergoing treatment for BRONJ (n=51) were evaluated. Sex, age, underlying diagnosis, type of bisphosphonate (BP), duration and rout of administration, location of osteonecrosis, sieric ctx, treatment and outcome were recorded.

Results.Underlying diagnosis indicating BP-treatment included osteoporosis. In 40 patients, BRONJ was preceded by tooth extraction, root apicotomy,; in 8 patients, the precipitating event was not identified.;in 3 patients there is no symptoms of BRONJ.

Conclusions. Prevention and management are reviewed, including guidelines for cessation of bisphosphonates prior to invasive dental treatment or after ONJ development, and the use of serum beta-CTX-1 in assessing risk. Considering the number of lesions, we found a significant correlation between the disease severity and the risk assessment using serum CTX.

Retrospective study on tongue pathologies subjected to biopsy in a period of 5 years

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Medical literature offers no surveys investigating the rate of lingual diseases following biopsy. Most researches exclusively analyse pseudodiseases diagnosed by physical examination; others, involving biopsies, concentrate on the whole oral mucosa. This survey considers 607 biopsies taken from different areas of lingual mucosa, in a population of patients come to the Department of Oral Diseases and Oncology University of Turin, in a 5 years period. The aim is evaluating the correlation between the clinical variables taken into consideration (i.e. biopsy region and kind of the elementary lesion) and each individual disease.

Results show that, considering biopsy region, clinical manifestation and following histopathologic diagnosis, some diseases occur more frequently than others, with a peculiar clinical aspect and a more common area. For instance, a biopsy performed on a lingual ulcer has a strong predicting association with a carcinoma, whereas a biopsy on a white lesion predicts for a leukoplakia or an oral lichen planus. Moreover, a biopsy of an erosion is representative of bullous diseases, whereas a biopsy on a verrucose-papillary lesion is significant in the fibroma. Furthermore carcinomas occur in the majority of cases on the lingual edge or pelvis, the oral lichen planus mainly on the edge, and fibromas mostly on the lingual tip. In conclusion, our survey can help the clinician in advancing diagnostic hypothesis, on the basis of the elementary lesion and its area.

Riga-Fede disease. Rare case report

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Aim. Riga-Fede disease (RFD) is an inflammatory disorder observed in the first weeks of life; it occurs in neonates and infants, commonly associated with natal (present at birth) or neonatal teeth (soon eruption thereafter), but can also happens in the following months, at the time of normal eruption of deciduous teeth. This pathology was described in the late nineteenth century by Dr. Antonio Riga and Francesco Fede. It is also known as "Traumatic oral granuloma" or "Traumatic eosinophilic ulcer" because of the presence, in histological sections, of a particular inflammatory infiltrate rich in eosinophils. The lesion begins as a small ulcerated area, thereafter, because of the continuous trauma; the lesion becomes larger with irregular bottom and hardened edges. The chronic trauma represents the most important etiopathogenetic factor for the formation of the "eosinophilic" inflammatory infiltrate.

Case report. A thirty-seven days old female, was referred to the emergency room of the Hospital of the University of Siena with high fever (38.6°C) from 4 days. During clinical evaluation was observed an erythematous plaque measuring 1 cm on the ventral surface of the tongue characterized by a central fibrous ulceration and hardened edges, associated with the primary lower incisors. The routine laboratory examinations including biochemical analysis, complete blood counts, and immunological study, resulted all normal. Seven hours later there was a rapid deterioration of general condition: increase in temperature (39,5°C) and heart beats (198/min), bilateral crackles, and the child became torpid and iporeactive, pupils react equally. New blood tests performed showed an increase of C-reactive protein (17.05 mg/dl) and neutrophil cells (81.4%). Few hours later clinical manifestations were dominated by neurological symptoms: hypertonia and sunset eyes. Lumbar puncture and cytologic analysis cerebrospinal fluid (CSF) showed the presence of Staphylococcus Aureus. The bacterial origin may be the oral lesion, so dental consultation was required. Considering the high grade of mobility of the dental elements, cause of the ulcer, their extraction was performed. The child was already under antibiotic therapy (Ceftriaxone 50 mg/kg die e.v.). No biopsy was performed because of the age of the infant, the particular site of the lesion and the clinical evidence of diagnosis. Twenty-four hours later the overall health of the patient greatly improved, with reduction of fever and lethargy. One week later the lesion was significantly reduced and less erythematous. Twenty days after the ulcer had completely recovered. On clinical findings and positive outcome after treatment we made diagnosis of RFD even if we didn't perform biopsy.

Discussion and conclusion. Riga-Fede is an extremely rare disease considered as a benign condition in healthy infants. Early detection of RFD is recommended, because ulceration of the tongue may also be due to other causes. It is important to consider that this lesion may be the initial presentation of some serious underlying neurological disorders: Lesh-Nyhan syndrome, Riley-Day syndrome, Gaucher syndrome, Microcephaly. The differential diagnosis of oral ulcers includes bacterial (primary syphilis and tuberculosis) and fungal infections (ulcerative candidiasis), allergic pathologies, immunologic diseases, genetic disorders, haematological disorders such as Agranulocytosis and Pernicious anaemia or malignant conditions (lymphomas, sarcomas and granular cell Myoblastoma). Other conditions which must be are Recurrent Aphthous Stomatitis and Wegener's Granulomatosis. Biopsy is important to exclude these other diseases and malignant conditions. There are several management options: oral disinfectant, corticosteroids, smoothing the incisal surface of the tooth, the construction a protective shield or teething ring. It is preferable trying conservative treatment than dental extraction, because this option may delay eruption of permanent tooth. In the present case the extraction of the lower incisor has been suggested as a more radical treatment choice to avoid mayor complications and to minimize the trauma associated. The wound healing after extraction of the tooth, and the antibiotic therapy have been useful for the resolution of the case.

Role of chemotherapy on dental plaque and oral mucosa. Is there a relationship?

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Aim. To highlight, through a comparative study, the influence of chemotherapics on dental plaque and oral mucosa.

Methods. 30 cancer patients divided in a test group receiving chemotherapy and a control group not receiving chemotherapy. The amount of bacteria were monitored, through 3 samples of dental plaque and saliva of the oral mucosa at t0, t1 and t2.

Results. In 95% of test patients it was not found a statistically significant change in the amount of bacteria before and after chemotherapy. The cross-sectional analysis showed no statistically significant differences between the 2 groups. In the most patients (57%) the oral microflora consisted mainly of Gram-positive cocci, while the remaining 43% of the bacterial flora of the patients also had periodontal-pathogenic species. Mucositis was higher in the test group.

Conclusions. The pathogenicity of the bacterial species considered is due to a decrease of immune response in cancer patients and less to changes of oral microflora.

Sapphire plus lesion detection system: a new diagnostic instrument for the prevention of malignant tumors in the oral cavity

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Aim. The scope of this work was to analyze the advanced technologies currently available for the identification and prevention of malignant tumors in the oral cavity. We have deemed it useful to employ the “Sapphire Plus Lesion Detection System” during first dental visits. This permits the early detection of potentially dangerous oral lesions. The “Sapphire Plus Lesion Detection System” works principally with a direct fluorescence mechanism, which gives us an overall view of the oral cavity. The potentially dangerous oral area under examination can appear dark and irregular, which immediately alerts us to the possibility of pathology.

Methods. We began experimenting with this technology about six months ago, and trials are still underway. To date it has involved 756 patients: 420 men and 338 women. Four main age groups have been considered: 20 – 35 years old,, 50 – 65 years old, 65 – 80 years old. The principal risk factors that contribute to the development of potentially malignant oral lesions have been considered: smoking, drinking, both smoking and drinking, and finally infective agents. During the first dental examination, 19 patients (2.5%), 13 men (68.4%) and 6 women (31.6%) resulted positive, of the 758 patients examined. After having established a clinic-diagnostic iter common to the 19 patients who resulted positive, we waited 14 days for the next evaluation and, if necessary, the incisional or excisional biopsy. In 11 of the 19 patients (57.9%), the suspect lesions regressed, then eventually disappeared. In the remaining 8 patients (42.1%), 5 men (62.5%) and 3 women (37.5%), following a re-evaluation at 3 months from the initial visit and with no regression at all, we deemed it necessary to perform an excisional biopsy on each of the patients in this group.

Results and conclusions. After obtaining the relevant biopsy results, it is was clear that 5 of the 8 total lesions could be classified as red lesions (Capillary Angioma) and 3 as white lesions (Candida Albicans and Leukoplakia) of the oral cavity. The red lesions were considered benign. Of the 3 white lesions, the Candida Albicans lesion is certainly the least dangerous and the easiest to treat, while the Leukoplakia, a precancerous lesion, is much more complex to deal with. Of a total of 8 patients, the men (5) were more affected (62.5%) compared to the women (37.5%). Our analysis led us to conclude that the initial dental visit is of primary importance in the early detection of potentially dangerous intra-oral or extra-oral lesions.

Scalpel vs diode laser in oral biopsy: a histopathological comparative pilot study

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Aim. To analyse comparatively the histologic pictures between biopsy specimens obtained with scalpel and those carried out by diode laser 810 nm.

Methods. A total of 18 patients affected by different types of lesions (oral lichen planus, oral-leukoplakia and fibroma) were subdivided in 3 patient groups, each of which was composed of 6 patients. Patients were undergone to double incisional biopsy within of the same lesion by scalpel and by diode laser with wavelength of 810 nm.

Results. In biopsy specimens obtained with diode laser, the fibromas appeared to be the histologic pictures more easily analysable in order to formulate the histological diagnosis. Diagnostic drawbacks were revealed in oral lichen planus and leukoplakia associated with dysplasia.

Conclusions. Data of present study are by prelude to an investigation widening aimed to the determination of use parameters for each tissue, to hold the tissues temperature below threshold of biologic damage.

Sperimental treatment of mucous membrane pemphigoid

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The term mucous membrane pemphigoid (MMP) refers to a group of chronic pathologies known as bullous, immune-mediated diseases characterized by subepithelial blisters affecting the mouth epithelium in particular. Pemphigus is caused by the formation of blisters between the epidermis and the dermis, whose rupture leads to ulceration of the mucous membrane and /or of cutaneous sites. Immunofluorescence studies showed that MMP has an annual incidence rate of 1.5 – 9.6% per 105 people (three times more common than pemphigus). The authors describe the effectiveness of the treatment with the concurrent administration of corticosteroids and tetracycline. The condition tends to go away after the pharmacological treatment, but recurrence is not uncommon. Patients need to undergo three-month follow-up as well as local and systemic evaluation and examinations performed by other consultants (gynecologist, oculist).

Spontaneous and multifocal ONJ risedronate-linked in patient with corticosteroids-induced osteoporosis: case report

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Aim. Report an exceptional multifocal case of ONJ(5 synchronous, different and spontaneous injuries)in a patient treated with oral bisphosphonates(risedronate). MATERIALS AND

Methods. The patient, female, 77 years old, suffering from rheumatoid polyarthritis, has been treated with courses of corticosteroids (methylprednisolone 4mg/2mg on alternate days) and immunosuppressive (leflunimide 20 mg) for over 10 years. She also carried out a 1-year treatment with risedronate 35 mg orally for osteoporosis induced by prolonged use of corticosteroids. In March 2010 clinical staging (OPT, spiral CT with 3D reconstruction of the facial) was performed. Diagnosis was five locations of multifocal ONJ III stage left and right maxillary with chronic sinusitis, right and left half-jaw (two). Old age and the high risk of this anesthetic patient (ASA 3) required surgery in time intervals after discontinuation of risedronate, reducing the dosage of the corticosteroid and suspension of leflunimide.

Results. The high number and high degree of spontaneous ONJ, absolutely rare and unusual in patients treated with oral bisphosphonates, permitted an assessment of corticosteroid and immunosuppressive drugs such as additional risk of ONJ developing.

Conclusions. On the basis of those findings it recommends to consider carefully the role of combined use of these drugs in development of ONJ.

Surgery management in Congenital Antithrombin III deficit patient: a case report

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Aim. The aim of our study is presenting congenital Antithrombin III deficit case focusing our attention on the surgery management of this patient during odontostomatologic surgery.

Methods. We adopted several diagnostic criteria: we analyzed in detail blood coagulation analysis to better understand the coagulation of this patient, after genetic research of genic alterations.

Results. We found that there was a genic anomaly in a part of Antithrombin III gene. This event caused abnormal bleeding during odontostomatologic surgery. Discussion: Even if it's a rare event, the treatment of this kind of patient can be very difficult for extreme bleeding.

Conclusions. In the light of all these elements and of their comparison with the existing literature, the identification and management of congenital Antithrombin III deficit patients is very important to prevent intra-operative complications related to abnormal bleeding.

Symptoms and risk factors associated with xerostomia: an epidemiologic study

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Aim. The aim of this study was to investigate symptoms and risk factors associated with self-reported xerostomia among Italian patients.

Methods. Data were collected from 601 self-administered questionnaires among adult patients attending for routine dental care. Logistic regression models to estimate odds ratios and 95% confidence intervals were used to investigate the association for exposures of interest, such as sociodemographic characteristics, and oral hygiene habits, self-reported symptoms, and xerostomia.

Results. Participants reported having dry mouth in 19.6% of cases. Xerostomia was associated with a significant increase in the odds of having dry lips, eye, skin, throat, and nose. Individuals with self-reported xerostomia were three times more likely to drink water to swallow food than were patients without xerostomia. Older patients were significantly more likely to report dry mouth, and the prevalence of xerostomia increased with increasing age. The prevalence of xerostomia in patients taking one or more drugs was significantly higher compared to medication-free patients, and increased with increasing numbers of medications used. Finally, individuals with a nervous/mental disease or who wore removable dentures were five times more likely to develop xerostomia compared to healthy individuals.

Conclusions. Clinicians should be familiar with the symptoms of xerostomia and be prepared to diagnose, monitor and treat patients with this condition.

The epithelial-mesenchymal transition in oral cancerogenesis

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Aim. The epithelial-mesenchymal transition (EMT) is a biologic process allowing an epithelial cell to undergo multiple biochemical changes that enable it to assume a mesenchymal cell phenotype, which includes enhanced migratory capacity and invasiveness. Because of these features, EMT has been claimed as a possible mechanism involved in cancer development. To study the role of the EMT markers in the oral mucosa cancerogenesis process, we performed an immunohistochemistry (ihc) analysis on normal, dysplastic and neoplastic samples.

Methods. We performed an IHC analysis of 12 markers (β -catenin, Cdh1, Zeb, Scrib, Caveolin, Muc1, Fibronectin, Vimentin, N-cadherin, Snai-1, Snai2, Maspin) on 54 samples of oral mucosa (12 normal, 33 dysplasia, 9 carcinoma)

Results. Nine markers' intensity index (cdh1, scrib, caveolin, muc1, fibronectin, vimentin, n-cadherin, snai-1, snai-2) resulted in accordance with the onset of EMT process during the development of oral carcinoma, while 3 markers resulted in contrast with EMT development (β catenin, Zeb, Maspin).

Conclusions. The role of EMT in the development of malignant features of the oral mucosa needs to be further investigated before defining it as a real player in the neoplastic development of oral mucosa.

The Low Level Laser Therapy in the management of the patient affected by neurological Burning Mouth Syndrome (B.M.S.)

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The Burning Mouth Syndrome (B.M.S.) is a peripheral neuropathy characterized by burning symptoms of oral mucosa (tongue, lips, palate), frequently associated with dysgeusia and dysphagia, without clinical signs which could refer to an evident structural damage. This study, based on histological evidence of degeneration of peripheral nerve fibers at the burning sites, wants to evaluate the efficacy of laser biostimulation through the Low Level Laser Therapy (LLLT). The study was conducted on a sample of 38 patients, (study group: 12 men, 26 women) through the use of GaAs diode laser (LUMIX 2[®], Fisioline) and on a control group of 8 patients (2 men, 6 women). On the control group the laser has been previously screened to block irradiation. The preliminary stages of selecting patients to be treated, in order to exclude other factors or diseases related to burning mouth symptom, included the completion of a questionnaire and some specific hematological and allergy analysis. The results have seen on the study group an improvement in symptoms in 29 of the 38 patients (76%). On the control group, 7 on 8 patients have not had a significant improvement (87,5%). The B.M.S. is still an open chapter of oral pathology in terms of etiology and treatment: the Low Level Laser Therapy is however proving to be a valuable support in the treatment of oral burning symptom and functional deficits associated with it, such as dysgeusia and dysphagia.

The mtDNA D-loop sequence analysis to differentiate local recurrences from second primary tumors

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Aim. The distinction between Second Primary Tumor (SPT) that is phylogenetically independent from the primary tumor and Local Recurrence (LR) that is instead phylogenetically related, should be mandatory since it may influence the prognosis and the type of treatment of a second OSCC. Most authors agree with the clinical criteria of Hong et al, that are based on the histological pattern, distance and time of occurrence of the second manifestation. In this study we used the mitochondrial DNA (mtDNA) D-loop sequence mutation analysis to validate the clinical classification in differentiating SPT from LR.

Methods. The study population consisted of 15 patients operated on OSCC that presented a second tumor. Following classification of Hong et al, 10 cases were classified as SPT and 5 cases as LR.

Results. The mtDNA analysis revealed 4 cases phylogenetically related (suggesting LR) to the first tumor, and 11 cases phylogenetically unrelated (suggesting SPT). A strict relationship between mtDNA analysis and clinical classification was found in 12 (80%) cases, while a discrepancy was found in 3 cases: 2 cases clinically classified as LR were instead phylogenetically unrelated, while one case clinically classified as SPT was instead phylogenetically related.

Conclusions. the diagnosis of LR or SPT based only on the clinical classification seems to present some limitations that could be overcome combining the mtDNA D-loop sequence analysis.

Tongue dysplasia by induced dental trauma: proposal of a morpho-protector device to prevent the progression oral cancer

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Aim. Chronic traumatism caused by posterior crossbite may induce oral chronic ulcer which may be indistinguishable from an oral carcinoma, because it may be non-painful and with a hardened base and raised borders. In this respect, we purpose a morpho-protector device suitable to prevent chronic traumatism of the tongue.

Methods. In this case by removing the potential cause of dysplastic tongue ulcer an acrylic resin device with specific flanges to tongue protection was planned in order to permit the reduction of lesion.

Results. Examination of the lesion was performed at 15, 30, 45, 60 days, to verify the effectiveness of the morpho-protector. After the 60th day the lesion was healed.

Conclusions. Our results support the direct implication of chronic dental traumas like potential etiologic factor of oral dysplasia and it demonstrates that prompt removal of the cause may heal an ulcerative lesion that otherwise could evolve in an oral carcinoma.

Unexplained Somatic Comorbidities in Patients with Burning Mouth Syndrome: A Controlled Clinical Study

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Aim. To evaluate the prevalence of unexplained extraoral symptoms (UES) in a group of patients with burning mouth syndrome (BMS) and compare the prevalence with that in patients with oral lichen planus (OLP) and age- and gender-matched controls.

Methods. The occurrence of UES was analyzed in a group of 124 BMS patients, a group of 112 oral lichen planus (OLP) patients, and a group of 102 healthy patients.

Results. In the BMS group, 98 patients reported UES, while 4 patients reported only oral symptoms. A painful symptomatology in different bodily regions was reported more frequently by BMS patients (83.3%) than by OLP patients (1.8%) and healthy patients (11.7%). The differences in the overall UES between BMS (96.1%) and OLP patients (9.3%) and between BMS (96.1%) and healthy patients (15.7%) were statistically significant. The UES in BMS patients consisted of pain perceived in different bodily areas (OR:255), in the ear-nose-throat district (OR:399.7), neurological symptoms (OR:393), ophthalmological symptoms (OR:232.3), gastrointestinal complaints (OR:111.2), skin/gland complaints (OR:63.5), urogenital complaints (OR:35), and cardiopulmonary symptoms (OR:19).

Conclusions. The great majority of BMS patients presented with several additional UES, indicating that various medical disciplines should be involved in the BMS diagnostic process. Furthermore, the results suggest that BMS may be classified as a complex somatoform disorder rather than a neuropathic pain entity.

Vanilloid and cannabinoid receptors in tongue of burning mouth syndrome patients

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Aim. Burning mouth syndrome is as an intraoral burning sensation for which no medical or dental causes can be found and in which the oral mucosa has a normal appearance. It remains an unknown disease for which long-term treatment is still lacking. The aim of this study is to assess in human tongue the alteration of TRPV1 expression, a transient receptor potential channels which mediate the sensation produced by chilli peppers, cannabinoid receptors type 1 (CB1) and type 2 (CB2) expression, which are pathway-related to TRPV1, and the remodelling of extracellular matrix.

Methods. The study was performed on 8 healthy patients and 9 BMS patients. All patients underwent a 3-mm punch biopsy at the anterolateral aspect of the tongue close to the tip. Specimens were included in paraffin and serially cut to obtain 6 µm thick sections. The sections were processed for TRPV1, CB1 and CB2 immunohistochemistry and for Sirius Red staining to highlight the collagen fibers using also polarized light.

Results. The data evidences a statistical increase of TRPV1 in epithelium of the tongue together with a decrease of CB1 and an increase of CB2. A statistical decrease of sub-epithelial collagen fibers, especially collagen type I, was also observed.

Conclusions. The tongue of BMS patients presents alterations of three receptors involved in pain transmission at epithelial level and a degradation of extracellular matrix. These data could be useful for future therapies.

Vesicles-blistering diseases of the oral cavity

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Aim. A detailed clinical examination of the oral mucosa of an asymptomatic patient may be the best opportunity for early diagnosis of an autoimmune disease, since many autoimmune diseases show their primary signs in the mouth.

Methods. At department of oral pathology we studied a group of 20 people who showed signs of the vesiculobullous diseases to establish the connection between them and the lifestyle of patients.

Results. Leukoplakia lesions were detected 5, 5 oral lichen planus, 3 mucous membrane pemphigoid, 4 multiform erythema, 3 of uncertain origin

Conclusions. Autoimmune diseases with oral manifestations are not common in the population studied. Since the initial manifestations of most of these diseases are highlighted in the oral mucosa, early diagnosis and appropriate treatment protocol will slow the spread of these lesions, contributing enormously to a better prognosis and quality of life of the patient

ORAL SURGERY

A Literature Review about the management of postoperative pain in patients undergoing surgical extraction: drugs compared

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Aim. The causes leading to surgical extraction are multiple: severe caries, periodontal disease, orthodontic-prosthetic needs, root fractures, ectopic or impacted teeth. The management of postoperative complications, such as pain and inflammation, is a crucial stage of the healing process. AIM To analyze kinetic and dynamic properties in order to identify an adequate drug therapy that ensures the most appropriate postoperative course.

Methods. Through a rereading of the most reliable scientific positions, it was paid particular attention to anti-inflammatory and analgesic action of NSAIDs, anaesthetics and opioids.

Results and conclusions. The incidence and intensity of postoperative pain depends mainly on: socio-cultural extraction and personality of the patient, surgical technique adopted, type of anaesthetic used. The guidelines suggest that NSAIDs should be chosen in a sequential scale based on the entity of painful symptomatology. For mild pain are effective: analgesics without anti-inflammatory action (acetaminophen, metamizole), derivatives of salicylic acid, NSAIDs with moderate efficacy (ibuprofen, piroxicam) and weak opioids (codeine phosphate, destropopossifene, tramadol). For moderate pain it can be administrated acetaminophen with codeine or NSAIDs with greater effectiveness (nimesulide and diclofenac). For severe pain it can be prescribed opioids (pentazocine, buprenorphine) or NSAIDs with high analgesic action (ketorolac).

A prospective clinical study of implants placed after maxillary sinus augmentation with bovine bone mineral

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Aim. The aim of this study was to evaluate the survival and success rates of implants placed in maxillary sinuses grafted via a lateral approach with bovine bone mineral (Bio-Oss®, Geistlich Biomaterials).

Methods. Sixty-eight maxillary sinus augmentations were performed in 60 patients. Only patients presenting with a residual bone height ranging from 2,3 mm to 5,8 mm (mean: 4.5 mm) and with a residual bone width of at least 5 mm (mean: 5,8 mm), and with acceptable vertical intermaxillary relationship were included in this study. Bovine bone mineral was the only grafting material used: a resorbable membrane was placed in all patients over the lateral window (Biogide®, Geistlich Biomaterials). All implants (120) were placed approximately 6 months after the grafting procedure. Implants were loaded 4 to 5 months after implant placement. Implant survival and success was evaluated according to Albrektsson et al. criteria.

Results. All sinus grafts showed a full integration. The mean follow-up after the start of prosthetic loading was 24 months. The mean marginal bone loss around dental implants was 0,85 mm (range 0,3 - 2,2 mm - 0,35 DS); only 3 implants showed a marginal bone loss higher than that proposed by Albrektsson et al. for successful implants. No implants were removed during the follow-up period. The overall survival and success rates of implants were 100% and 97,5%, respectively.

Conclusions. Despite the limited follow-up, the present study suggested that bovine bone mineral is a reliable material for grafting expanded maxillary sinuses and may guarantee survival and success rates of implants consistent with those reported for implants placed in native bone.

Ablative Erbium laser: treatment of difficult surgical approach keratosis

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Leukoplakia is considered the most frequent oral precancerosis. Treatment of these lesions is primarily focused on reducing the percentage of malignant transformation that might occur years after the first appearance in oral cavity. Some authors consider traditional surgical therapy an over-treatment for oral leukoplakia without dysplasia. The aim of this work is to assess both effectiveness and morbidity of Erbium ablative laser as an alternative in the management of difficult surgical approach white lesions. 61 patients respecting fixed inclusion and exclusion criteria, afferent to the Dental School of Turin University Oral Pathology and Oncology Department, were treated. Erbium laser was used with an ablative method (lesion vaporization) without oral tissues contact. Before and after intervention we considered clinical parameters like localization, dimension, surgical intervention length and complete or incomplete answer to treatment and symptomatologic ones estimated with VAS scale, OHIP-14 test and DTA (number of analgesic pills taken). The conclusion reached is that Erbium laser could be considered a valuable surgical device in non-dysplastic leukoplakia treatment thanks to its poor symptomatology and its shorter surgery time length compared with traditional surgery. In addition, the obtained outcomes are in accord with recent scientific literature.

Akt and Aromatase polymorphisms predict the risk of bisphosphonate-related osteonecrosis of the jaws in patients

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Osteonecrosis of jaws (ONJ) is a serious complication of zoledronic acid administration in cancer patients with bone metastases. BPs and estrogens show a synergistic activity on bone tissue, by inhibiting osteoclast differentiation and increasing osteoclasts apoptosis. Genetic polymorphisms have been suggested as promising tools to identify patients with higher risk of drug-related adverse events. The purpose of this study was to identify correlations between the SNPs of estrogen receptor- α (ER- α), aromatase and Akt-1 in oncologic patients treated with zoledronate, and the occurrence of osteonecrosis. The study was conducted on a cohort of subjects with cancer divided into test group, who developed osteonecrosis, and the control group with no detectable bone lesions. ER- α , Aromatase and AKT-1 polymorphisms were analyzed on DNA from blood. No significant differences between test and control groups was observed when ER- α polymorphisms were analyzed. AKT-1 C20675G showed higher frequency of TC-TT alleles in the control group (40%) than in test group (8.33%) ($p < 0.01$). Concerning the Aromatase polymorphism, the TT allele frequency was significantly higher in test than in control group (36.67 vs 16.98%, $p = 0.0439$, O.R.-2.83). The minor TT allele is associated with higher aromatase activity; therefore, elevated levels of estrogens could enhance the risk of BP-related ONJ. This study suggests the importance of genotyping to identify patients at risk of manifesting this serious disease.

Assessing the relation between the inferior alveolar nerve and the third inferior molar: report of two cases

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Aim. We analyze the diagnostic options evaluating the relation between the inferior alveolar nerve and apical roots and/or roots of the inferior third molars; these have been applied to two clinical cases. MATERIALS AND

Methods. The percentages of interactions involving the relations that the 3rd lower molar contracts with the neurovascular canal are outlined below: Mandibular canal vestibular 61% Mandibular canal lingual 33% Mandibular canal in direct contact with the root apices/roots 6%. The signs of interest may thus arise, the deviation of the mandibular canal (1), the interruption of the mandibular canal lamina (2), the radicular radiolucency (3), the deflection (4) and the narrowing of the roots (5). The narrowing of the canal (6) shows an adaptation of the latter to root morphology. Last case is represented by a radiolucent and bifid root apex (7) where the canal is located below the root apex could be in close proximity to them. Some signs, however, exclude intimate relationships with the canal: Root distance > 1 mm to the canal. Root tangent to the canal. Root superimposed to the canal.

Results. We confirm what could be search in the international literature where, however, could be found different views about treatment of these.

Conclusions. A careful assessment of the radiological examinations of the first level as OPT can lead in many cases to avoid a second investigation level more invasive for the patient.

Biodegradable plates and screws for stabilization pediatric maxillofacial fractures: clinical and radiological evaluation

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Aim. The availability of bioresorbable devices has revolutionized the treatment of mid-facial pediatric fractures. These materials are totally biocompatible, they do not need to be removed, but completely degrade after bone healing and do not cause restriction and reduction of bone growth. Consequently it has opened a new way for the use of resorbable material that present potential advantages of which mainly is the gradual degradation over a period of time, accompanied by the progressive healing of the bone with no removal operation necessary after bone healing.

Aim a clinical-radiological review of pediatric maxillofacial fractures treated surgically with bioresorbable plates at the Pediatric Maxillo-Facial Unit of Children Hospital - Civil Hospital Brescia is presented.

Methods. From June 2008 to June 2010, 30 pediatric patients with maxillofacial fractures were surgically treated with resorbable plates. Out-patient follow-up was clinical at 1, 3, 6, 12, 24 months and radiological at 1, 6, 12, 24 months. Of the 30 patients 10 selected at random were re-examined; the medical history was investigated and clinical and radiological examinations performed. Then, the patient was asked to give an evaluation of the surgical outcome by expressing adequate, good or excellent result.

Results. In all patients the resorbable plates provide a rigid fixation of maxillofacial fractures after the reduction and postoperative stability. More over, surgical time can be reduced and implant removal through a secondary surgical procedure it can be avoided.

Conclusions. our experience suggests that in the pediatric midfacial fractures the resorbable plate devices must be considered the method of choice.

Bisphosphonate Related Osteonecrosis of Jaws from 2003 to 2011: retrospective analysis

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Aim. The aim of this study is to collect all BRONJ cases diagnosed in A.O.U. Careggi, Florence, until March 2011.

Methods. There was been 60 BRONJ cases, since their first diagnosis in our clinic in 2004.

Results. The incidence reached the maximum peak in 2008(25%). BRONJ has been more prevalent in female gender(58.33%) than in male one(41.67%). Medium age at diagnosis has been 66yrs 3mth. Among general diseases, Multiple Myeloma has been the most frequent(33,33%), followed by Mammary Carcinoma(25%), Osteoporosis(10%), Prostatic Carcinoma, Lung Carcinoma, Lymphoma and Leukemia. The drug who caused the higher number of BRONJ has been zoledronic acid (86.66%), followed by alendronic acid and pamidronic acid (5% both) and risedronic acid (3.44%). Assumption time has been variable(mean value 30,4 months). Lesions development has been consequent to tooth extraction(77.97%), prosthodontics trauma(15.25%), endodontics, implantology, no dental act. Lesions were located in lower jaw(57.6%), upper jaw(27.1%), both(15.2%). At diagnosis, 57 patients was in AAOMS Stage 2 and 3 in Stage 3. Major surgery treatment has been carried out in Stage 3; pharmacologic therapy and minor oral surgery in Stage 2. Follow-up: 24 patients improved clinical status, 6 get worse, 9 died, 3 did not come to control.

Conclusions. By our clinical findings we assessed that from 2009 BRONJ incidence is vertically decreased, due maybe to a better knowledge of subject matter and risk factors.

Bisphosphonates osteonecrosis of the jaw in 26 non-oncologic patients

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Bisphosphonates (BP) are non-metabolized analogues of pyrophosphate used to treat metabolic bone diseases, such as osteoporosis. In this study we report the occurrence of bisphosphonates-related osteonecrosis of the jaws (BRONJ) in 26 female patients who received BP therapy for non-oncologic reasons with different drug schedules. From June 2005 to December 2010 26 patients affected by BRONJ, who had been treated with BP for non-oncologic reasons, were observed at Oral Medicine, Oral Pathology and Laser Assisted Surgery Unit, University of Parma, Italy. Patients were classified as affected by BRONJ according to AAOMS guidelines. A history of dental surgery was reported for 19 patients (73%). Out of 22 patients who have been treated in our unit, 20 (91%) recorded healing improvement with a mean follow-up of 20 months, with particular regards to those treated with oral surgery and laser applications (10/22, 45%) who were all characterised by complete mucosal healing over time. The risk in developing BRONJ in patients treated with BP in oncologic-reasons is lower than in cancer patients, however, in our experience, is not so negligible. It would therefore be advisable for the prescribing physician to recommend a dental check-up prior to treatment at least for those patients who have not been to the dentist in the last 12 months. Dental health should also be monitored once treatment has begun in order to maintained good oral hygiene and diagnose early symptoms of BRONJ should they arise.

Bone grafting with the Khoury's technique

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Aim. The bone augmentation technique proposed by Khoury et al, which is a possible choice among numerous bone grafting methods, increasing the cellularity and the rate of the bone healing of the graft, reduces the lag time before implant insertion from 6 to 3-4 months. The optimization of the bone volume obtained from the grafting site is another advantage of this technique.

Methods. We treated twelve atrophy cases: nine maxillary and three in the posterior mandible. Bone harvesting site were the mandibular symphysis in four cases and the mandibular ramus in the others. The technique consists of five steps: 1) harvesting of the bone graft; 2) sagittal splitting of its cortical part; 3) rigid fixation at the atrophy site; 4) filling of the remaining space with cancellous bone harvested, with a bone scraper, beneath the harvest site; 5) soft tissue closure without tension.

Results. Implant insertion was performed after four months (using Bicon dental implants). Implant supported fixed prosthodontics were completed after three months without complications.

Conclusions. In our four-years experience this technique seems to be reliable and predictable. Moreover it is designed to obtain an "anatomic - biological" reconstruction of the alveolar ridge.

Comparative study of radiation dose following full-mouth intraoral radiographs, Panoramic radiograph, and Cone Beam Computerized Tomography

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Studies have shown that the early detection of periodontitis is fundamental for the prevention of tooth loss and the maintenance of periodontal tissues. Nevertheless current approaches for the diagnosis of the periodontal condition, show some limitations, in particular intraoral radiography might over or underestimate periodontal defects or bone level. One of the main obstacles is the overlap of anatomical structures. To avoid these limitations cone beam computed tomography (CBCT) has been introduced. This machine is less expensive and shows higher resolution in an axial plane if compared to the conventional CT system. The aim of this study is to investigate the effective dose of the most common technique of radiodiagnosis in periodontology: full-mouth radiographic status, panoramic X-ray and CBCT. A RANDO (Radiation Analogue Dosimetry System; Nuclear Associates, NY) of human skull with some thermoluminescent dosimeters has been used, to register the radiation dose of the three radiographic exams. For each exam the skull has been irradiated five times. Considering the mean dose, the value of the three systems were 48 ± 9 μSv for the CBCT, 9 ± 2 μSv for the panoramic rx and 39 ± 7 μSv for the full mouth radiographic exam. Differences between full mouth radiographic rx and CBCT were not statistically significant. Therefore with regards to the effective dose, in implant and periodontal therapy, the use of CBCT does not present any limits if compared to the conventional radiographic systems.

Computer guided implant surgery

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Aim. The successful performance of minimally invasive surgical approaches is becoming possible thanks introduction of the computer guided surgery. The use of computer applications in surgical implant dentistry, can help the surgeons study the anatomical structure of patients pre-operation, so the surgeon can perform the flapless implant surgery. For dental implant surgery, the flapless approach is the most innovative site preservation technique. The purpose of this study is a literature review about the effectiveness and the success of computer guided flapless implant surgery.

Methods. Having completed a search on medline for articles between 1960 and 2009, we excluded opinion papers and analysed only those clinical studies with five or more subjects.

Results. The available data on flapless technique indicates that implant survival is approximately 98,6% in the prospective cohort, while the retrospective studies demonstrated 95,9% survival. The radiographic alveolar bone loss ranges from 0.7 to 2.6 mm after 1 year of implant placement. The incidence of intraoperative complication was 3,8% of reported surgical procedures.

Conclusions. This study demonstrates the effectiveness of computer guided flapless implant surgery. Some authors demonstrated that if the vascularity of peri-implant tissue at the site of injury is maintained without flap elevation, wounds heal more quickly. Long-term data is necessary to confirm the success of this surgical technique.

Computer-assisted implantology: PROS and CONS of full-arch rehabilitation

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Aim. Computer-assisted implantology allow the clinician to have a tridimensional prosthetically-guided plan and to develop the surgical treatment obtaining very precise and predictable results. AIM OF THE WORK The aim of this work is to compare and contrast the traditional technique and the computer-assisted one, in order to evaluate pros and cons.

Methods. 20 patients have been treated (10 male and 10 female), both with partial and total edentulism. 18 resulted to be eligible for immediate implant loading. All of the patients underwent OPT and TC-scan rx evaluation, making use of radiologic device for the double scan technique, which made it possible to realize a computer-assisted plan of the rehabilitation.

Results. In those cases treated with the computer assisted technique, an important reduction of the surgical procedures was achieved, permitting a clear plan of the final prosthetic rehabilitation. Besides, the absence of post-surgical swelling increased the patients' compliance. DISCUSSION AND

Conclusions. Computer-assisted implantology involves these advantages: a better compliance of the patients; a reduction of the surgical procedures and of the healing period of the tissues. Disadvantages: not all the patients are eligible for these technique, as a sufficient bone quantity is needed; primary stability is necessary; difficulty in computer-planning; cost of the device and of the procedures.

Conservative periodontal surgery: a meta-analysis

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Aim of this study was to evaluate the effectiveness of conservative surgery in the treatment of intra-bony defects in terms of tooth survival and periodontal surrogate parameters such as probing depth (PPD), the gain of clinical attachment (CAL-gain) and the gingival recession (REC). Therefore, a meta-analysis including only prospective studies was designed. To be included papers had to have at least 10 patients with infra-bony defects caused by periodontal disease and treated with a conservative surgical approach. The search yielded an initial total of 364 articles. After abstract and full text screening, 55 articles were selected. Statistical analysis at 12 and 60 months of follow up were performed according to the type of flap used. Surgical preservation of the papilla (PPF), showed a PPD reduction to 2.47 ± 0.12 mm, the value of CAL-gain was 1.83 ± 0.22 mm and the REC increase was 0.98 ± 0.26 mm. Patients treated with open flap debridement (OFD) showed that PPD reduction was 2.73 ± 0.20 mm, CAL-gain was 1.80 ± 0.12 mm and REC increase was 1.53 ± 0.10 mm. 60 months or more follow-up showed a CAL-gain of 1.7 ± 0.3 mm, a PPD reduction of 3.3 ± 0.7 mm and a REC increase of 1.8 ± 0.4 mm. To conclude it seems that conservative surgical approach may be, in some indications, an effective technique to treat intrabony defect.

Dental extractions in bisphosphonates therapy patients associated with LLLT: a protocol for the prevention of BRONJ

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Aim. The pathogenesis of bisphosphonate related osteonecrosis of the jaws (BRONJ) is still poorly understood. Trauma during dental surgery is a well-recognized predisposing factor for BP-associated ONJ. However, about 40% of cases are not related to dental procedures (so-called “spontaneous” ONJ). Evidence-based guidelines for the management of dental extractions in patients under BP therapy (BPT) are still lacking.

Methods. Five hundred patients (120 males, 380 females; mean age 66.5 years, range 30 to 89 years) under BPT were referred at the Unit of Oral Pathology and Laser-assisted Surgery of the University of Parma, Italy, between June 2006 and January 2011. All patients were in need of teeth extractions for periodontal, prosthetic or infective reasons. Two hundred sixty-five patients received BPT for oncological diseases (60 for multiple myeloma MM, 205 for bone metastases BM) and two hundred thirty-five for osteoporosis (OP). The mean duration of BP therapy was of 35 months, 90 patients had discontinued therapy after consulting specialist, before the extractions. As risk factors, 60 patients were smokers, 43 ex-smokers, 30 were affected by diabetes and 115 were under corticosteroids. Antibiotic treatment (amoxicillin 2 grams per day) was administered three days before and 2 weeks after dental extractions. Patients were additionally treated with low level laser therapy (LLLT) through Nd:YAG laser (1064 nm, Fidelis Plus®, Fotona, Slovenia – power 1.25 W; frequency 15 Hz; diameter of the fibre:320 µm), 5 application of 1 minute each. Patients were evaluated 3 days and once a week for 2 months after the extractions and every time they received LLLT. After this period, follow-up scheme included monthly clinical evaluations as well as radiological examination every six months. Mean follow-up was 15 months (ranging from 4 to 31 months).

Results. Five hundred dental extractions (279 mandibular, 221 maxillary) were performed. 150 out of 500 dental extractions were performed through the use of mucoperiosteal flaps and osteotomy. 15 patients have had a difficult but complete healing of the post-extractive sockets in 8 weeks, probably because of the effect of BPT also on soft tissue. A post-extractive bone exposure was observed in 5 patients; all patients were then treated with a minimal-invasive surgical approach and they finally healed. In the remaining cases no other BRONJ were observed in a mean follow-up of 24 months.

Conclusions. Our experience supports the hypothesis that the association of antibiotic treatment and LLLT can be effective in preventing ONJ after dental extractions in patients under BPT.

Diode laser in oral surgical management

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Aim. Soft-tissue lasers have numerous applications in oral surgery, including gingivectomy, frenectomy, operculectomy, papilla flattening, uncovering temporary anchorage devices, ablation of aphthous ulcerations, exposure of impacted teeth, and even tooth whitening. Before incorporating soft-tissue lasers into clinical practice, the clinician must fully understand the basic science, safety protocol, and risks associated with them. The purpose of this article is to provide the correct management regarding safe and proper use of soft-tissue lasers in dentistry. MATERIALS AND

Methods. Two different wavelengths were used (diode 810 nm, diode 980 nm) in different surgical situations: maxillary vestibular and lingual frenectomies and surgical site decontamination. The wavelengths were used with different parameters for each case, according to international current studies in view of minimally invasive therapy.

Results. The cases reported showed very quick and good healing of the laser treated tissues. These treatments, necessary for i.e. periodontal therapy or orthodontic therapy or for its completion, become extremely simple, safe and rapid and the dental specialist can perform them himself.

Conclusions. The laser technique is very effective in many operative and surgical procedures during dental therapy. Further studies are however necessary to set the treatment protocols in surgical biostimulation.

Displacement of an upper third molar in infratemporal space

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Aim. Accidentally iatrogenic displacement into soft tissues after upper third molar extraction can often occur during dental surgery. Displacement in infratemporal space is a rare but described complication. This case report show a way of access to manage this type of complication occurring after a wrong extraction technique. MATERIALS AND

Methods. A female patient came in emergency to our Clinic sent by her clinician. Her dentist had displaced the upper left molar in soft tissues after a wrong extraction procedure. The patient lamented swelling and pain. At the clinical exam there was an oro-antral communication next to the tuber maxillae. At the radiographic exam radiolucency was present in the area of the lost element. A TC was prescribed to understand the exact position of the dental element. The element was between middle and lateral pterygoideus muscles. An intraoral incision and access was decided to retrieve the element.

Results. After one week symptoms were solved. An orthopantomography scan for control was requested after one month. The radiographic exam confirmed no osseous fragments in the soft tissues and the removal of the tooth displaced.

Conclusions. Clinicians must keep in mind that many rare complications can occur during surgical procedures and often hospitalization it is required.

Effectiveness of the treatments of oral surgery wounds through the applications of a substance for topical use: clinical case reports

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University "La Sapienza" - Rome

Aim. The healing of a wound is an essential part for the success of surgical treatment and our operations allows us to decrease the risk of infections due to the penetration from germs in the submucosal plans. The aim of this study is to assess and report cases of healing after oral surgery by topical application of Aminogam, amino acid-based gel.

Case descriptions. We have been selected cases of patients, who have to undergo treatments for oral surgery extraction, implant and endodontic surgery: these patients were taught and treated with Aminogam for 5 days after the application of sutures after each main meal and after good oral hygiene. We have considered clinical parameters such as the presence of pain, swelling, heat, redness, inhibition of masticatory function in relation to the type of healing (1st-2nd intention) and the level of oral hygiene both smokers and non-smokers.

Results. the application of the gel Aminogam has proven to be effective in the closure of wounds and in the management of wound postoperative complications after 5 days and as an aid in the process of regeneration of the oral mucosa.

Conclusions. these case reports show how the process of wound healing is very complex and it is characterized by a number of factors and tissue reactions to ensure an orderly conduct.

Effects of PRGF on Wound Healing of Bone Defects

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In molecular biology, "platelet-derived growth factor" plays a significant role in chemotaxis, blood vessel formation (angiogenesis) and stem cells mitogenesis. The purpose of the present study was to evaluate the early wound healing events of bone defects in human maxilla or mandibula with or without the application of Growth Factor Plasma riched. Control sites received the bonegraft alone. In the control sites after 3 weeks the extraction socket was found half filled, and the whole cavity after 7 weeks. In the growth factor sites, new trabecular bone was seen in the whole cavity after 3 weeks, and thick trabecular bone and lamellar bone were observed after 7 weeks. Clinical and radiographic findings suggest that application of platelet-derived growth factor can stimulate bone regeneration, and it has been shown to improve the effectiveness of bone grafts and to increase bone density.

Efficacy of low level laser therapy on neurosensory recovery to the inferior alveolar nerve

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Università degli Studi di Torino

Aim. the study wants to evaluate the therapeutic efficiency of laser irradiation on neurosensory recovery of the inferior alveolar nerve (IAN) after oral surgical treatment.

Methods. In this study we report results achieved with 60 patients affected by paresthesia of the lip, chin, gingiva and buccal regions. All patients were treated with low level laser therapy (LLLT). Every patient is submitted to 10 laser treatment, once a week, with GaAs diode laser (Fisioline Lumix 2 Dental). Clinical neurosensory test and visual analog scale (VAS) were used before and after treatment.

Results. Our preliminary outcome indicate that the 70% of patients had a significant neurosensory return demonstrated by objective and subjective test.

Conclusions. The results reported in this study indicate that LLLT has potential to improve the neurosensory return in the patients with IAN paresthesia.

Evaluation of PRGF efficacy in the healing of the post-extractive sockets in diabetic patients

R. Pol, F. Tabasso, S. Di Romana, M. Mozzati

Università degli Studi di Torino

Aim. this study wants to demonstrate if the application of platelet rich in growth factors (PRGF) after a dental extraction in diabetic subjects could modify healing process and reduce infective complications after an extraction.

Methods. 10 patients with type I diabetes and complications (nephropathy, retinopathy and heart disease) has been selected. In this study has been included patients that have bilateral extractions. One of post-extractive site has been treated with platelet gel, and the contro-lateral has been used as control. Platelet gel has been prepared with Anitua E. technique. Healing valuation has been done by misuration of mesio-distal diameter and oral-vestibular diameter of sockets and intra-alveolar probing depth; post-operative pain has been valued by VAS scale system.

Results. Post-operative condition is always better in PRGF site with statistical difference after 14 days ($p=0.0024$). Percentage of closure of diameters is major in PRGF group with statistical difference at 3 days ($p=0.0014$), as reduction of probing depth ($p=0.027$)

Conclusions. clinically and statistically, there is a clear vantage for PRGF sites. Basing on these results this technique is useful to benefit healing in patient with healing defects.

Evaluation of two types of therapeutic approach to BRONJ

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In this study we report our experience about the treatment of 8 patients affected by BRONJ. According to the AAOMS's guidelines, the treatment objectives for patients affected by BRONJ are to eliminate pain, control infection of the soft and hard tissue, and minimize the progression or occurrence of bone necrosis. Surgical debridement has been variably effective in eradicating the necrotic bone, because it may be difficult to obtain a surgical margin with viable bleeding bone. Surgical treatment should be delayed if possible and reserved for those patients with stage 3 disease or in those cases with welldefined sequestrum. Only in case of severe pain, debridement, including resection, in combination with antibiotic therapy, may offer long-term palliation with resolution of acute infection and pain. Depending on clinical needs, the patients were assigned to one of two following groups: group A, patients to submit to a surgical debridement, and group B, patients to submit to a simple removal of sequestrum. The results of this study showed that, when it's possible to wait the formation of bone sequestrum, surgical treatment may be resolute.

Frenulectomy: case report

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The frenulum is a small fold of mucous membrane that secures or restricts the motion of two parts; it is constituted by oral mucosa, connective and muscle fibers. The most frequent are: medial vestibular, distinguished between upper labial and lower labial; lateral vestibular, around upper and lower premolars; medial lingual, connecting the floor of the mouth to the midline of the underside of the tongue. Frenulum abnormalities can cause diastemata between incisors, both upper and lower incisors, and ankyloglossia due to the presence of a short, hypertrophic lingual frenulum. The diagnosis of ankyloglossia mainly involves the impossibility to touch the roof of the mouth with the tip of the tongue, split tongue with a medial fissure on protrusion, back curvature of tongue and consequent impossibility to tongue protrusion for more than 1 or 2 cm beyond the lower incisors. The presence of ankyloglossia also cause phonation disorders, atypical deglutition and related orthodontic problems; a flat tongue may cause excessive pressure on lower incisors and growth deficits with occlusal problems, therefore patients with ankyloglossia frequently develop over bite and class-II disorders with over jet. Case Report: a 14-year-old female patient with short lingual frenulum and phonation disorders. After a few drops of anesthetic to the side of frenulum, we performed 5-point v-shaped sutures and sectioned the soft tissues of frenulum with a scalpel. Tissue lateral to the margin of the wound was undermined by sharp and blunt dissection, and then sutured without tension. After removal of lingual frenulum, the tongue can soon extend up and out of the mouth, without split tongue and back curvature. Finally, we performed an interrupted suture.

Gingival plexiform neurofibroma in a neurofibromatosis type I patient: case report

A. Licciardello, F. Dede, L. Di Conza

Sapienza University of Rome

Aim. Neurofibroma is an uncommon benign tumor of the oral cavity derived from the cells that constitute the nerve sheath. Neurofibromatosis type I is an autosomal dominantly inherited disease due to an alteration in the long arm of chromosome 17. Oral cavity involvement by a solitary and peripheral plexiform neurofibroma in patients with no other signs of neurofibromatosis is uncommon. Plexiform neurofibroma arises along peripheral nerves and tends to involve the smaller branches of the nerves, producing a poorly circumscribed and locally invasive tumor. Objective The aim of this study is to report a case of NF-I with gingival involvement in a 30 year old female patient, arrived at UOC of Paediatric Dentistry Univeristy of Rome "Sapienza".

Methods. At the examination, the patient presented a lot of fibrotic injuris localized on tongue and left and right mandibular gingiva. Following a careful history, we proceeded to the surgery of excisional biopsy with asportation of fibrotic injuris and subsequent request of histology exam.

Results and conclusions. The histology report, of samples examined, reports a diagnosis of plexiform neurofibroma. The injuris, histologically are formed of a cluster of convoluted nerves, surrounded of Schwann cells and fibroblasts proliferation. This aspect is called plexiform neurofibroma and are considered to be pathognomonic of for NF-1. Approximately 21% of patients with NF-I presents plexiform neurofibromas.

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Histologic and histomorphometric evaluation of extraction sockets: PRF vs Bio-oss

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Aim. Today, implant therapy can be considered predictable, but the mechanisms by which implants are anchored in peri-implant bone are not fully understood. The use of Platelet-Rich Fibrin (PRF) facilitates the processes of post-surgical wound healing by accelerating both the integration and remodeling of bone. PRF contains a significantly higher amount of platelet cytokines, which are harnessed within the mesh of the product. The objective of this study was to evaluate the most appropriate procedure for improving and accelerating the healing process and to optimize the performance of prosthetic therapy in terms of predictability, durability and speed of functionalization, by comparing the histological and histomorphometric of bone regeneration achieved by using PRF and Bio-Oss[®].

Methods. We examined two sites after extraction, one of which was treated with Bio-Oss and membrane and the second with PRF and membrane. Four months later a core of tissue was harvested in the regenerated area. Both sites were subjected to histological and histomorphometric examination and the Bone Volume (BV) was calculated.

Results. From these preliminary assessments it appears that the use of PRF accelerates and improves the quality of bone healing.

Conclusions. Our results allows us to test post-extraction implants and to confirm its effectiveness.

Histological and histomorphometric comparative study in human maxillary sinus augmentation surgery with two different bone graft biomaterials : Bio-Oss versus Gen-os

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Aim. This investigation was designed to compare the histomorphometric behavior of two different bone graft substitutes, Bio-oss and Gen-os, placed in human in the treatment of the maxillary bone atrophy.

Methods. 20 patients, requiring maxillary sinus lift in order to place implants into posterior maxillary region (unilateral or bilateral), were involved in this study. Geistlich Bio-Oss® whit particle size 1-2 mm was used in the surgical treatment of sinus augmentation in 10 patients, while OsteoBiol Gen-Os® mix granules with a particle size from 0.6 to 1 mm in the remaining 10. Six months later implant sites were created and biopsies from residual crest were taken, with trephine drill (2 mm internal diameter and 3 mm external), for histological analyses.

Results. The first results show that all biomaterials examined resulted in being biocompatible and seemed to improve new bone formation in maxillary sinus lift. No signs of inflammation are present. Radiographic tests performed at 3 months away from the implants show the absence of radiolucent gap between the fixture and peri-implant bone. All the implants reopened for screw placement of healing are integrated with the sound of wooden percussion. The first analysis of biopsy taken from grafted sites with Bio-Oss seem to show a greater amount of newly formed bone and little residual biomaterial.

Conclusions. Only after analysis of all the biopsy we might be able to make judgments more complete.

Horizontal root fractures: integrated treatment and different clinical outcomes. Case report

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Aim. Root fractures of permanent teeth are uncommon injuries that compromise only 0,5% to 7% of traumas. The prognosis of injured teeth involving root fractures depends on pulp vitality, periodontal health and the radicular level of the trauma. These case reports describe the different management of 3 maxillary central incisors with horizontal root fractures and underline the distinct post-treatment outcomes.

Methods. All root fractures were reduced and rigidly splinted. During follow-up one tooth were observed to have healed spontaneously without any sign or symptom and tested as vital to termic pulp test. About the other two teeth after an attempt at endodontic treatment, the option was to remove two apical fragments by surgery. The postoperative period shows very satisfactory results with regard to wound repair and tooth mobility.

Discussion. These case reports supports the published literature that healing in root-fractures may follow different patterns, even in adjacent teeth; so it's important to take a multidisciplinary approach and remember that the maintenance of a natural tooth during growth could be an excellent intermediate solution before implant rehabilitation.

Immediate loading of single immediate implants in the maxillary esthetic zone

V. Arata, M. Mozzati

Università degli Studi di Torino

Aim. For the replacement of a single missing anterior tooth with an implant-supported crown clinicians now are more oriented towards immediate postextractive implant placement with immediate crown. The study wants to establish a careful case selection and surgical protocols as prerequisites for successful bimodal treatment. The study evaluate implant survival, radiographic marginal bone level changes, mucosal stability and esthetical patient satisfaction of immediate single implant loading in extraction sockets in the esthetic region.

Methods. 35 patients requiring extraction of a single tooth in the maxillary esthetic zone were treated for single-tooth replacement with immediate loaded implants. Periapical radiographs and CT were obtained. Flaps were avoided. Atraumatic extraction was done. Titanium implant was placed in the fresh extraction socket and after 1 hour the provisional acrylic crown was delivered.

Results. All 35 implants were placed in fresh extraction sites. No implants failed. Follow-up starting at implantation day ranged from 24 to 60 months, evaluating marginal bone in preoperative, and follow-up radiographs. The soft-tissue reaction was described as being very favorable due to the presence of a provisional crown during the healing phase.

Conclusions. Immediate loading of single-tooth implants in fresh extraction sites at the anterior maxilla can result in successful implant integration and stable periimplant conditions up to 2-5 years.

Inflammatory radicular cyst in adult: a conservative surgical treatment without biomaterials application, aimed to a subsequent implant rehabilitation

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¹Freelance dental practitioner

²"Sapienza" University of Rome

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Aim. Currently, the use of biomaterials in filling considerable size cystic cavities (4 cm) is the elective procedure according to many authors, as they prevent any aesthetic and functional disorder to the patient, being osteoconductive and acting as a scaffold for the new bone formation. However, if the support bone structures are preserved during cystectomy, it is possible to opt for the natural clot, because, in the presence of intact cavity walls, it represents the best filling pabulum because of various growth factors and no absorption difficulty. This work describes a clinical case of radicular cyst localized in the right posterior mandible of an adult patient, treated with conservative surgical approach at the University of Chieti.

Methods. The patient, with negative anamnesis for previous or in progress diseases, was subjected at pre-operative routine analysis and radiographic examinations and the cystic surgical enucleation was planned with a buccal approach. Following cystic removal was not located any synthetic filler, as the roof of the residual cystic cavity (bony ridge) was perfectly preserved.

Results. The histological examination confirmed the radicular origin of the cyst. The patient showed an adequate compliance and was added in a detailed follow-up program. The radiographic examinations at 6 months, showing new bone apposition, lend support to the surgical technique and the type of clinical-surgical approach to this cystic lesions, motivated by the implant purposes subsequent to the cystic cavity healing.

Conclusions. The authors consider that the conservative surgical treatment of cysts performed with this technique, can be executed also without the use of synthetic fillers, when support bone structures are preserved, because they permit through the curtain effect given by the flap periosteum to be supportive to the blood clot that organize itself after the flap primary intention suture.

Interdisciplinary management of impacted maxillary central incisor

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Istituto di Clinica Odontoiatrica Università degli studi di Sassari

Aim. The purpose of this case report is to discuss the delayed eruption of permanent maxillary central incisor in a 11-year-old boy.

Methods. This poster highlights a surgical-orthodontic approach to the management of the left permanent maxillary central incisor.

Results. The results show not only the alignment of impacted left incisor in the arch but also healthy gingival tissue.

Conclusions. Surgical exposure of the crown followed by orthodontic treatment is a reliable option for the management of impacted teeth.

Jaw bone cysts: presentation of some cases of late diagnosis

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"Sapienza" University of Rome, Department of Odontostomatological and Maxillofacial Science

Jaw bone cysts are pathological cavities with a solid, liquid or semi liquid filling, characterized by a covering epithelial tissue that is based on a fibrous capsule. Proliferation stimulus or alteration of normal odontogenesis process on epithelial remnants, present in bone structure after embryogenesis, lead to benign neoformations with a mostly slow and often asymptomatic expansive activity. Instead of the ever more innovative knowledge and diagnostic techniques, the increasing capacity with detriment of bone, followed just later by anatomic adjacent structures displacement and by a variable symptomatology, frequently means occasional discover of lesions in advanced phase of development. The aim of this study is to report some cases in which diagnostic late required a conspicuous discomfort for patients not only for the biological loss but also because of the difficulty and the invasivity of therapeutic solutions.

Laser Treated Surface Implants; RFA Analysis During 12 Months of Immediate Functional Loading

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Università degli Studi di Firenze - Scuola di Specializzazione in Chirurgia Odontostomatologica

Aim. The purpose of this study is to evaluate the behaviour of laser treated surface implants (Geass Way Synthegra®) after 12 months of immediate functional load.

Methods. 18 consecutive patients, 80 laser treated surface implants. The samples do not included smokers and bruxers. 10 mandibular and 8 maxillary cases were treated within 48 hours using metal-reinforced acrylic provisional prostheses. They were rehabilitated with prosthesis full-arch Toronto type, fixed overdenture and partial prostheses. All implants were followed for 12 months. Follow-up consisted in clinical as well as radiographic examinations. Furthermore, resonance frequency analysis was performed on all implants in the following intervals of time: Time 0 (surgery); 1 month; 3 months; 6 months and 12 months.

Results. The success rate obtained was 100% after 12 months. The average radiographic bone level change was 0.45 mm at 3 months, 0.57 mm at 6 months, 0.60 mm at 12 months. The average of ISQ values was: 70,0 (surgery); 66,0 at 1 month; 67,5 at 3 months; 70,0 at 6 months; 73,0 at 12 months. The clinical aspect of perimplant soft tissues did not show signs of alteration in any intervals of time and platform-switching solution is compatible with a better tissue healing.

Conclusions. A high success rate can be achieved when laser treated surface implants are immediately loaded with fixed prostheses restorations in the maxilla and mandible.

Lingual frenectomy: a comparison between the conventional surgical and laser assisted procedures

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Aim. Ankyloglossia, commonly known as tongue-tie, is a congenital oral anomaly characterized by a short lingual frenulum that may contribute to feeding, speech and mechanical problems. Case presentation: the purpose of this study is to compare the advantages of laser vis-à-vis conventional frenectomy in both intra- and post-surgical phases.

Methods. This study took into consideration two patients, respectively 8 and 9 year old. The first one underwent a common surgical procedure. A Nd:YAP micropulsed laser device with a micropulsed wavelength of 1340 nm and power of 8 W was used for the second. The postsurgical discomfort and healing characteristics were evaluated.

Results and discussion. The results indicated that the Nd:YAP laser has the following advantages when compared to the conventional frenectomy: 1. Soft tissue cutting was efficient, with no bleeding, giving a clear operative field. 2. There was no need to use sutures. 3. The surgery was less time-consuming. 4. There was no postsurgical infection and no need for analgesics or antibiotics. 5. Wound contraction and scarring were decreased or eliminated. 6 Despite the initial slowness of the healing process, the complete and final recovery was faster.

Conclusions. Considering the above elements, it is possible to assert that the laser frenectomy has a series of unquestionable advantages if compared to the conventional surgical technique.

Lipomas of oral cavity

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Lipomas are benign tumors consisting of mature adipocytes. The most affected anatomical sites in the oral cavity include the buccal mucosa, lips, and tongue. Benign tumors of the adipose tissue have been classified according to their histologic features and growth patterns into simple lipoma, fibrolipoma, angioliipoma, infiltrating lipoma, pleomorphic lipoma, osseoliipoma, sialoliipoma, chondrolipoma, myxoliipoma, and spindle cell lipoma. Various pathogenetic mechanisms, such as origin from lipoblastic embryonic cell nests, metaplasia of muscle cells, and fatty degeneration, have been proposed as a putative causative factor for simple lipoma. Other factors such as trauma, infection, chronic infection and hormonal imbalance may also have been implicated. Histopathological examination revealed lobules of mature fat cells surrounded by thin fibrous connective tissue septa. Adipose cells were uniform, round, with clear cytoplasm and eccentrically placed nucleus mimicking signet ring appearance confirming the diagnosis of lipoma. In conclusion, lipomas of the oral cavity are rare tumors that usually do not show recurrence after conservative surgical excision, irrespective of the histopathological variant.

Marsupialization of detigerous cysts related to impacted third molars

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Aim. The purpose is to present an alternative treatment to surgical extraction of third molars if exits the risk to damage nearby vital structure.

Methods. This technique has been described for the first time in 1892 by Partchs. Under local anesthesia, the surgeon provides a vestibular access to the area to reach the dental tissue. An incisional biopsy is provided for histological analysis of the pericoronaric tissues. After washing the cavity, a Jodoformic gauze is put inside to maintain the communication of the surgical space with the mouth. After two days the gauze is removed, the cavity washed and a new gauze is introduced inside with fewer pression. The same procedure is repeated every four days for one month and a half.

Results. The result of this procedure is represented by the absence of symptoms, progressive reduction of the gauze filled into the cavity, the radiographic evidence of a loss of radiolucency around the dental crown related to a new ossification of the site.

Conclusions. The main disadvantage of this conservative surgical approach is represented by the period of medication during which patients' compliance is determinant. This clinical behavior is based on the principle of apoptosis infact has been reported that concentrations of apoptosis-related factors, such as Bcl-2, decrease in the epithelial tissue components after decompression and marsupialization of the lesion.

Multidisciplinary treatment of oroantral fistule

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Oroantral communication is a common complication often encountered by oral and maxillofacial surgeons. The decision of which treatment modality to use is influenced by many factors. The literature review revealed various procedures for the closure of oroantral fistulas. These procedures may be subdivided into local flap, distant flap and grafting. Multidisciplinary treatment are infrequently reported in the closure of oroantral fistulas. The advantages and the limitations of these procedures are discussed. The study included 18 patients with clinically and radiologic confirmed evidence oroantral fistula. We performed in these patients a functional endoscopic sinus surgery (FESS) that remove anatomical and pathological obstructions of the middle meatus in order to restore normal clearance of the sinuses. The aim is to create an extensive antrostomy of the pathological sinus to prevent the formation of inflammatory gas, that increase the sinus pressure with a mechanical stress on the floor of the sinus. At the same time oral surgeons reconstruct the oroantral communication using palatal, buccal, or combined buccal- palatal flaps. Eighteen patient, 10 males and 8 woman (man age 34 and age range 30-50) underwent a multidisciplinary approach. Therefore, the cases described here is a very significant example of the diagnostic challenges and treatment of oroantral fistule and a high degree of long-term success can be predicted.

Odontomas as the cause of retention

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Odontomas are developmental malformations (hamatomas) Which of Dental Tissues are found randomly while Conducting X-rays to check teeth exchange. A compound odontoma Consists of many separate and small, tooth-like structures (denticles), produced by localised Probably, multiple budding of the dental foil or by the formation of many tooth germs. Clinically, a compound odontoma Usually is found in the anterior part of the jaws Where It can produce a painless. May be seen radiographically swelling.The denticles as separate densely- calcified bodies. At 17 years old patient, AP, presented a lesion in the lower right quadrant of the mandibular canine area That, at the Radiological examination, Was Identified as a compound odontoma. The odontoma Was then extracted through a surgical treatment. The final Radiological examination has shown the lesion's healing. Finally, with the removal of the lesion, we obtained a correct orthodontic alignment of the permanent dentition in the lower right quadrant.

Omologous Iliac Crest Graft vs Autologous Calvaria: An immunoistochemical Analysis on Angiogenic Proteins

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Aim. To evaluate the neoangiogenic response of host tissue towards two different bone grafts: Omologous Iliac Crest Graft (OG) and Autologous Calvaria Graft (AG), by investigating differences in typical ECM molecules expression.

Methods. OG and AG were used as grafting materials in patients requiring bone regeneration for following implant supported prosthesis. Specimens were withdrawn at the moment of implant insertion, that is about 4 months after grafting. Immunoistochemical analysis (with DAB staining method) was performed to evaluate the expression of MMP2, MMP9, and VEGF. ANOVA method was used to statistically evaluate differences in molecules expression.

Results. MMP2 level of expression was higher in OG, from MMP9 and VEGF analysis resulted higher in AG than in OG.

Conclusions. Even if OG and AG appeared clinically integrated with the host tissue, indicating they can be successfully used as graft in pre-prosthetic regenerative techniques, the expression of molecules specifically involved in neoangiogenesis slightly differs from each other. Neoangiogenic phenomena are strictly necessary for graft integration, as the invasion of the biomaterials by new blood vessels is indispensable for its following colonization by mesenchymal stem cell, which will lead the process of bone regeneration. However, 4 months after grafting, a greater activity could be noticed in AG graft than in OG, as statistically supported. Moreover, as MMP2 is mostly involved in the initial phases of neoangiogenesis, while MMP9 and VEGF are enrolled in supporting endothelium, it could be hypothesized that, at the same experimental time point, the regenerative processes proceed more quickly in site regenerated with autologous bone than in that treated with homologous bone graft.

One stage multidisciplinary therapy to treat oro-antral communication associated with chronic sinusitis: a case report

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Aim. Tooth extraction represent one of the causes of iatrogenic oro-antral communication associated to chronic sinusitis. The aim of the multidisciplinary approach was to treat the sinusitis and to close the communication.

Methods. Patient presents a iatrogenic oroantral communication (2 cm diameter) and chronic sinusitis determined by the extraction of an upper molar. Under general anaesthesia, a functional endoscopic sinus surgery (FESS) was performed to clean the antrum and a titanium grid was fixed intraorally by two osteosynthesis miniscrews and covered by flap without tensions. Analgesic and antibiotic treatment was administered after surgery. Suture was removed two weeks after surgery.

Results. At two months the passage of air and liquid from the mouth to the nasal cavity ended despite the presence of a little exposure, 1mm, of the grid. There was an early resolution of signs and symptoms of chronic sinusitis. At 6 months, CT showed new bone formation on the inner side of the titanium mesh with complete closure of the communication.

Conclusions. Using this technique the normal function of the maxillary sinus was restored and the communication was closed by inducing bone neo-formation under the grid using the principles of GBR.

Oral Surgery in patients taking oral bisphosphonate (BP)

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Aim. Oral surgery is a major risk factor to develop ONJ in patients taking intravenous-BP, while is less know this relationship in patients treated with oral-BP. The aim of this study is to assess the risk of ONJ when this patients undergo to oral surgery.

Methods. 127 patients that fulfill following selection criteria were enrolled: osteoporosis with a T-score <2,5, therapy at least from two year BP per OS, no neoplastic pathology. Using Spearman statistical analysis we evaluated changes in CTx serum level at increasing of cumulative dose (CD). Surgical procedures performed were: multiple teeth extraction, implant insertion, apicectomy, cyst enucleation.

Results. No case of ONJ in examined patients. Average CD in this group of patients was significantly high but we found no relevant reduction in serum CTx levels even for prolonged period of treatment.

Conclusions. Not exists linear relationship between changes in CTx and CD, however changes in CTx levels make us suspect that only treatment with oral-BP for more than 12 years increase the risk of ONJ. Based on this considerations if the period of treatment with oral-BP exceeds 10 years, CTx levels is useful to estimate of the bone metabolism reduction. We should no generalize on ONJ because chemical structure and mode of administration of different type of BP are correlated with different risk to develop ONJ after oral surgery interventions.

Oral surgery procedures in patients with severe thrombocytopenia. The use of platelet concentrates instead of platelet transfusion. Comparison between these two methods

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Aim. Patients with severe thrombocytopenia are among the most challenging patients to treat for surgical dental procedures and represent a high bleeding risk. The aim of this scientific study is to reduce the post-extractions hemorrhagic complications in patients who present a platelet count less than 50000/mL, comparing a routine standard method to manage these patients, as the platelet transfusion, with a new biomaterial product as the platelet concentrates.

Methods. Patients with a platelet count between 18000/mL and 46000/mL were included in the study. 186 dental extractions were carried out on 60 patients. Before the extraction some of the patients involved had to receive a platelet transfusion while others had their post-alveolar sockets treated with Plasma Rich in Growth Factors (PRGF). The patients were evaluated after 6 and 24 hours, 3 and 7 days to assess the bleeding and the risk of hematoma.

Results. The reported incidence of bleeding within the 7 days after surgery is lower in the patients managed with PRGF and the occurrence of hematoma is also reduced.

Conclusions. The application of an autologous Plasma Rich in Growth Factors in the post-alveolar socket reduces the hemorrhagic risk in patients with severe thrombocytopenia. The application of this platelet concentrate may be used safely to treat this type of patients also considering that it is easy to obtain this product in a standardized way with the reduction of the cost.

Periodontal Ligament-Derived Stem Cells: Achieving Regenerative Potential

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Aim. Periodontitis leads to periodontal ligament (PDL) destruction, whose regeneration is the goal of periodontal therapy. A new approach is based on combining PDL mesenchymal stem cells (PDLMSCs) with 3D cell culture conditions by biomaterial and bioreactor. To evaluate PDLMSCs' viability, proliferation and osteogenic potential when cultured in different conditions.

Methods. PDLMSCs obtained from patients undergoing to impacted third molar extraction, were plated onto 25-cm² flask, expanded in Dulbecco's Modified Medium/10% fetal calf serum. PDLMSCs were tested for MSC markers (as CD90 and Stro-1) then committed to osteogenic differentiation with different strategies, including the use of Polymeric Micelles (PMs) as delivery system for inducers. PDLMSCs were then embedded in 3-D culture systems (alginate beads) in a rotating microgravity bioreactor, analyzed for viability, osteogenic potential and effectiveness of phenotype modulation. Osteogenic potential was evaluated through mineral matrix deposition and markers expression (like Runx2 and Col I).

Results. i) PDLMSCs showed osteogenic potential in all culture conditions; ii) PDLMSCs can be efficiently maintained in 3-D systems; iii) 3-D system increased osteogenic potential of the cells.

Conclusions. i) PDLMSCs are good candidate for PDL tissue regeneration; ii) PDLMSCs differentiation toward osteogenic lineage can be enhanced before in vivo transplant through specific culture conditions and strategies.

Periodontal management on the treatment of gingival overgrowth

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Aim. The aim of the present study was to compare oral improvement achieved by different periodontal therapies (surgical and non-surgical) for different aetiological factors induced gingival overgrowth in 10 subjects (mean age +/- SD = 15 +/- 1 years; age range = 10-30 years).

Methods. Subjects received oral hygiene instructions, scaling, surgical treatment (if necessary) and periodontal maintenance therapy. Clinical parameters were taken at baseline, after initial treatment and after periodontal surgery.

Results. The decrease in the clinical index values after all treatments compared to the initial values is found to be statistically significant ($P < 0.05$). Although there was a statistically significant difference in all aspects of the clinical index values of the study groups after initial treatments, for drug-induced gingival overgrowth subjects full improvement was seen only after periodontal surgery.

Conclusions. Attention to plaque control and removal of local irritants is very important for the gingival health of the patients in puberty. In puberty, plaque-induced gingival overgrowth can be treated with plaque removal. However, these approaches alone do not prevent drug-induced gingival overgrowth and surgical therapy often becomes the treatment of choice.

Piezoelectric bone surgery: benefits in the mandibular rehabilitations with short implants and in the surgical treatment of bone neoformations close to the mandibular nerve

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Aim. Use surgical techniques that preserve the anatomical structures, as the mandibular nerve, allowing the insertion of dental implant in atrophic mandible (vertical atrophy), minimizing the risk of neurological complications.

Methods. We used Piezosurgery® for implant site preparation in 15 cases of partial mandibular edentulism with vertical atrophy (9mm+/-2mm) and for surgical treatment of 10 cystic neoformations. For the implant site preparation we used inserts OP5, IM2P, OT4, IM3P; for the dental extractions EX1, EX2 e EX3; buccal osteotomy was obtained by the inserts OT1, OT5, OT7 and OT8R/L; neoformations' separation close to the mandibular nerve was achieved with OP3, OP7, OP3A and EL1 inserts. Biomaterial (GenOss) covered by PRF (fibrin riched plasma) membranes was inserted in the bone defects.

Results and conclusions. Neurological injury are avoided by piezoelectric bone surgery and we easier preserve anatomical structures. The intra-operative visibility, sensitivity and control are optimized.

Piezoelectric bone surgery is a safe technique, selective, and useful in case of high intra-operative risk, allowing the use of short implants without make use of more invasive technique in case of vertical atrophy.

Piezoelectric instruments versus traditional techniques to harvest bone from intra-oral sites for pre-implant reconstruction of atrophic edentulous jaws: a comparative study

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Aim. The aim of this study was to compare the morbidity following bone harvesting from intra-oral sites to reconstruct atrophic edentulous ridges performed with: a) piezoelectric instruments; b) fissure burs assembled on straight handpieces

Methods. Forty patients presenting with bone defects following severe resorption of partially edentulous ridges were consecutively treated by means of bone reconstruction with autogenous bone blocks taken from the mandibular ramus. The bone harvesting procedure was performed with: a) Piezoelectric instruments (20 patients - test group); b) Fissure burs assembled on a straight handpiece (20 patients - control group). The following parameters, in terms of morbidity were evaluated: inferior alveolar and lingual nerve sensory alterations, haematomas, swelling, pain, and length of surgery

Results. In the test group 3 complications were recorded, including 1 case of transitory paresthesia of the alveolar nerve, 1 case of protracted pain and 1 case of relevant haematoma. In the control group 4 complications were recorded, including 1 case of transitory paresthesia of alveolar nerve, 1 case of protracted pain associated to local infection, and 2 cases of relevant haematomas. The mean length of surgery was respectively 15 minutes for traditional technique and 19 minutes for Piezosurgery. All bone grafts underwent a successful integration in the recipient sites

Conclusions. This study demonstrate that the use of piezoelectric device for intra-oral harvesting of bone taken from the ramus may be considered a valid alternative to the traditional techniques.

Piezosurgery Vs high speed handpiece: Influence of milling in the post-operative discomfort following lower third molar surgery

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Aim. This study was made to compare the postoperative clinical discomfort and duration of after lower jaw surgery performed with two different surgical methods: the traditional high speed handpiece extraction and Piezosurgery.

Material and

Methods. In the period from January 2009 to January 2011, 156 patients were selected, (80 men and 76 women aged between 27 and 35) each of them needed surgical extraction of one third molar, and after regional anesthesia (Carbochaine 3% without vasoconstrictor) were subjected to the extraction using two alternative methods and random. All the extractions were performed by the same operator and we have recorded the duration of each action. All patients underwent the same analgesic protocol (paracetamolo 1000/mgr as needed) and were handed a questionnaire for the evaluation of postoperative discomfort (Happy Face Pain Rating Scale). After 10 days the suture were removed (Vicryl 4/0) and the questionnaire was given back.

Results. Comparing the two methods, we obtained the following results: in 78 extractions performed by traditional methods, we recorded an average time of operation of 41' with average values of the Happy Face Pain Rating Scale equal to 6.5 in the first 5 days and 3.5 in seconds 5 days; in 78 extractions performed with Piezosurgery we recorded a significantly higher average length (52') with a comparable post-operative discomfort (6.0 in the first 5 days and 3 in the seconds 5 days).

Conclusions. To sum up we can conclude, in our experience, that the traditional method is currently the gold standard for surgery of the third molars, the Piezosurgery, in experienced hands, it can be a valuable alternative if you submit details of anatomical factors (Example: proximity to the N.A.I.) that require a less aggressive approach.

Piezosurgery vs traditional technique: advantages and disadvantages from literature

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Aim. To describe the utility of piezosurgery in dentistry through data retrieved from literature and clinical experience

Methods. A literature review from 1960 to 2010 was carried out considering different operative techniques: tooth extraction, ridge expansion, sinus lift, bone graft, implant site preparation, orthodontic microsurgery.

Results. Literature shows that this instrument gives great advantages associated with some small disadvantages. Performing surgery with this instrument allows delicate osteotomies reducing the risk of injury of neuro-vascular structures with a bloodless surgical field and the preservation of the vestibular bone; reduce the rate of perforation of sinus membrane in sinus lift technique; allows the expansion of extremely thin ridges; through micro-corticotomy facilitates and reduces the treatment time of adult orthodontic patients; avoiding the use of twist-drill we obtain a reduction of osteointegration time. Disadvantages are an increased operative time and costs.

Conclusions. Piezoelectric surgery through a selective and precise cut, an increased surgical intraoperative control, a bloodless surgical field, a reduction of surgical stress and a favorable bone healing response offers to oral surgeons a lot of advantages over traditional surgical techniques.

Piezosurgical lingual split technique: a novel approach for impacted mandibular third molar extraction. A case report

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Aim. The lingual split technique is a surgical procedure for extraction of impacted mandibular third molars throughout a lingual approach. The main disadvantage of this technique is the high rate of temporary lingual nerve injury mainly due to the trauma induced by the lingual flap retraction. The purpose of this paper is to suggest the use of piezosurgery to perform the lingual cortical plate osteotomy.

Case report. A right deep impacted lower third molar was radiographically studied and then extracted. Surgical procedure was performed under general anaesthesia and it lasted about 60 min. After the buccal and lingual full-thickness flaps were incised and elevated, a piezosurgical device was used for osteotomy. A well defined bony window was then removed and it allowed the entire tooth was extracted in a lingual direction. The patient didn't show any post-operative complication. Lingual and inferior alveolar nerve functionality was normal before as well as after surgery.

Conclusions. The use of piezoelectric surgery certainly allowed to preserve lingual nerve functional and structural integrity. The only disadvantage of this technique was represented by an operating time lengthening due to a lower power cut of the piezoelectric device, to the high mineralization of mandibular cortical bone and probably to the use of inserts with a low degree of sharpening. This work can be a starting point for further studies about this particular application of piezosurgery.

Platelet rich fibrin (PRF): from the definition of a laboratory protocol to the clinical application

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Aim. Blood products, substances with high content of fibrin and / or platelet factors may modulate processes of inflammation and enhance tissue healing. Recently in France was developed by Choukroun the Platelet Rich Fibrin (PRF). 1) Definition of an effective laboratory protocol for the preparation of the PRF, suitable to our environmental condition. 2) Assessment of clinical application in oral surgery of PRF obtained with this protocol, with particular attention to the impact made in the soft tissue healing and the post-operative prognosis.

Methods. The first phase was conducted in the Clinical Laboratory Hematology of Careggi Hospital in Firenze, and in the clinical phase, held in the Department of Oral Surgery of Careggi Hospital in Firenze, was selected a group of patients which had to undergo surgical avulsion of the third molar, maxillary sinus elevation and great implant surgery. Patients were divided into two groups. The first one, chosen randomly, was applied the protocol developed and the PRF was inserted in the surgical wound; the second group had no PRF employment into the wound.

Conclusions. Our results in the short term, confirm the improved ergonomics of the preparation protocol of the PRF differently from previous blood products. In addition to this, from a clinical point of view, we can assert that PRF seems to decrease the inflammation, the post-operative complications and to improve soft tissue healing in patients in whom it is applied.

Posterior Segmental Maxillary Osteotomies (P.S.M.O.) for the correction of over-erupted posterior maxillary segments for pre-prothetical purpose

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Aim. The morphological changes set in mandibular edentulous patient is the over-eruption of corresponding dento-alveolar maxillary segments. Common indications to segmental maxillary osteotomies are: correction of posterior cross-bites and anterior open bites; closure of existing edentulous spaces; need of occlusal repositioning of impacted canines or bicuspid by means of distal movements of posterior segments and segmental surgery for prosthetic purposes. The aim of this study is to evaluate the results of surgical correction of over-erupted posterior maxillary segments to allow prosthetic rehabilitation of the corresponding edentulous mandibular areas, when the space between the dental arches is so reduce not to allow any conventional prosthetic solution.

Methods. We treated 13 patients with huge over-eruption of posterior maxillary teeth due to absence of antagonists. It was monolateral in 8 cases, bilateral in 5. The prosthetic vertical space ranged between 0 and 4 mm, with a mean value of 2 mm. Such an important vertical reduction doesn't permit to restore an adequate occlusal plane, even utilizing alternative techniques like orthodontic therapy or endodontic therapy followed by height decrease of dental crowns. The analysis (test ANOVA) of achieved results shows that the surgical upward repositioning of posterior maxillary segments allowed an increase of vertical prosthetic space by a mean of 5,2 mm, permitting a satisfactory prosthetic restoration of the corresponding mandibular edentulous areas. This surgical technique led to excellent results, particularly when the vertical space was less than 4 mm. Few complication occurred, none as important to prevent the achievement of the programmed prosthetic results. The mean post-surgical hospitalization was 2 days. All the patients returned to their social and working life within 5-6 days. Therefore this procedure, besides leading to predictable results, presents low monetary, social and biological costs.

Preclinical animal model analysis of mesenchymal stem cells behavior from amniotic fluid with hydroxyapatite scaffold

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Aim. The aim of this study was to evaluate the osteoregenerative properties of mesenchymal stem cells from amniotic fluid associated with an osteoconductive biomaterial, hydroxyapatite, and compare their behavior with the use of biomaterial only in sinus grafts on ovine model.

Methods. Two sinus grafts were carried out with hydroxyapatite and AFSC in the side test, while in the control side only hydroxyapatite was inserted. Afterwards, histologic, ultrasound, radiographic and fluorescence microscopy analysis were performed. The animals were sacrificed at 45 days and the maxillary sinus were subjected of radiological and histological investigation.

Results. Radiological investigation showed a mixed echogenicity with an increased radiopacity in the side test than in the control side. The fluorescence microscopy revealed the presence of the AFSC in the grafted area after 45 days. Clinically, the surgical access in the side test resulted completely healed and closed. The histological analysis in the maxillary sinuses showed in the test side an abundant deposition of extracellular matrix with widespread areas of bone apposition in continuity with the endogenous bone structure. On the contrary, surgical access in the control sites appeared after 45 days still open. Histologically, these sites were characterized by low deposition of extracellular matrix infiltrated by fibroblasts and inflammatory cells, hyperplasia of the Schneiderian membrane. The same evaluation were conducted after 90 and 180 days after surgery. At 90 days, and especially in 180 days the differences between the side test and control side emerged after 45 days, appeared to be less obvious. In both sites it was possible to observe an abundant deposition of extracellular matrix, index of the future graft integration. Moreover, in the control side, the Schneider membrane did not show more signs of inflammation and hypertrophy as was noticed after 45 days. Although differences between the test side and control side tends to decrease over time, after 90 and especially 180 days, in control sites was possible to observe the persistence of normal phenomena of active bone remodeling. In the test sites such phenomena seemed to take the typical form of turnover that appeared in physiological bone tissue, with the presence of trabecular bone that completely replaced the primary woven fibers bone that can be observed in the early stages of the graft. In the control side, for the active remodeling, there are still some areas without normal trabecular appearance.

Conclusions. Our study has showed how the process of bone formation can be monitored using in vivo imaging studies. As the only biomaterial as biomaterial and AFSC together showed good ability to induce bone regeneration in vivo animal model, to significantly accelerate bone formation and to improve it in a qualitative point of view in the side test. The data collected from instrumental analysis in vivo were confirmed by investigations carried out after the animals sacrifice. At 45 days, the first test showed a higher degree of mineralization and the newly bone tissue formation showed a close continuity with the existing bone structure, index of the future integration. These data allow us to hypothesize that the AFSC, at long- term, maintain their regenerative proprieties playing a role both directly and indirectly in the process of bone formation. In fact, the regenerated bone tissue obtained at the sites with the biomaterial and mesenchymal stem cells from amniotic fluid appeared both qualitatively and quantitatively increased. These results confirm the importance of the osteogenic properties of mesenchymal stem cells, and demonstrates the importance of their use in regeneration of mineralized tissues.

Preventive Protocols for the Management of Bisphosphonates' Related Osteonecrosis of the Jaw: Five Years of Clinical Experience

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Aim. Management of BRONJ (bisphosphonate related osteonecrosis of jaw) is not predictable. Is therefore essential to establish a suitable preventive protocol, in order to reduce the incidence and co-morbidity of this pathology. Aim of our study is to evaluate the effectiveness of a preventive protocol, applied on onco-haematological patients suffering from multiple myeloma or other solid tumors, measuring BRONJ incidence.

Methods. Our study population counts 248 patients, 106 suffering from solid cancers (89 breast, 17 other tumors), 142 affected by MM. All patients were subjected to our examination, needing aminobisphosphonates therapy for the treatment of bone malignancies. Of the whole patients, 127 were screened before the start of aminobisphosphonates administration (G1), 107 entered the trial at yet started therapy (G2), 14 patients came to our attention with suspected osteonecrosis (G3). We have stated as end-point for data analysis September 2010, having started with the preventive protocol in December 2005 (58 months). We have then aestimated weighted incidence rate at patient level, then considering the duration of follow-up (1 month as unit) till BRONJ diagnosis. G3 patients were measured as 1 month follow-up patient, considering the time needed for the confirmation of the diagnosis.

Results. Patient based incidence rate measured 5,65% (7,04 for M.Ms, 3,77 for ST). Follow-up based incidence revealed a 0,33% of incidence (0,43 for M.Ms, 0,20 for ST).

Conclusions. We have aestimated the effectiveness of our treatment modalities retrospectively evaluating BRONJ incidence in our trial population. Both patient and follow-up data analysis showed a low BRONJ incidence among screened patient. Follow-up data analysis have then stressed the importance of the duration of follow-up, considering the higher weight of long treated patient.

Relationship between osteotome sinus floor elevation procedure and development of Benign paroxysmal positional vertigo (BPPV): an underestimate possibility

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The osteotome sinus floor elevation is generally used in moderately resorbed posterior maxilla to graft the maxillary sinus. The technique involves the use of flat or cup-shaped osteotomes of appropriate diameter that are tapped firmly to fracture the sinus floor and tent bony floor and membrane to a desired depth. An interesting and often underestimate complication of this procedure is Benign paroxysmal positional vertigo. BPPV is a vestibular disorder characterized by brief episodes of vertigo precipitated by a rapid change of head posture, usually following the assumption of a hyper-extended head position towards one side, and other neurovegetative symptoms related. It can cause stress if not identified correctly and managed properly because of its unpleasant and stressful symptoms. The pathophysiology, the available treatment options and diagnostic strategies of this disorder are discussed in this report focusing on its iatrogenic origin in case of osteotome sinus floor elevation.

Reliability of computed tomography in the assessment of position and morphology of impacted lower third molar with regard to the inferior alveolar nerve: a preliminary study

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Aim. The aim of this study was to assess the reliability of Computed Tomography (CT) in determining morphology and relationship of the impacted lower third molar with the inferior alveolar nerve (i.a.n.). Correlations have been also searched between radiographic and surgical as well as post-operative evaluation.

Methods. Twenty patients who an impacted lower third molar extraction was recommended to and who showed a orthopantomographic superimposition between the i.a.n. and third molar roots have been enrolled. In all patients a CT scan was performed to assess the relationship between i.a.n. and third molar root as well as apical root morphology. Surgical technique was scheduled on the basis of nerve location. After surgery, the extracted teeth were reconstructed and evaluated to determine whether radiographic assessment coincided with that clinic. Patients were re-examined at the time of suture removal, in order to identify possible impairment of i.a.n. sensibility.

Results. In 40% of cases, the i.a.n. was lingually placed to the third molar roots and in 9% of cases it did not have the same relationship with both roots. In 60% of cases the cortical radiopaque line between mandibular canal and tooth root was absent. In 36% of cases the i.a.n. was intra-operatively visible and in 50% of these it were lingually located. In only one case (4.5%) neuropraxia occurred.

Conclusions. CT provides a reliable aid in planning lower third molar extraction.

Short implants an alternative to rehabilitate posterior areas avoiding bone regeneration techniques

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Aim. The purpose of this study is to compare survival rate of short implants inserted at the department of oral surgery of AOUC with data extrapolated from literature.

Methods. 30 short implants Megagen™ (diameter 6, 6.5, 7 mm; length 6, 6.5, 7, 7.5, 8 mm) were inserted in posterior areas of the jaws. Clinical and radiographic evaluation at 1, 6 and 12 months to calculate survival rate. A review of clinical studies from 1990 to 2011 was made in Medline to obtain data on the survival rate of short implant.

Results. Both the data extrapolated from the literature, both our data show a survival rate >95%.

Conclusions. Short implants increase patient compliance due to reduction of the post-surgical discomfort and of the costs. From what emerges from the scientific literature short implants seem to be a viable alternative to the bone regeneration techniques. Our data confirm this suggestion.

Surgical debridement of alveolar site with Sonic instruments in BRONJ affected patients

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Aim. The solution of jaw's osteonecrosis bisphosphonates related cases is been increased by preventive guide lines. First of all pharmacological treatment of affected areas has to be chosen. Surgical resection is indicated when lesions are extended more than 2-3- cm. When lesions are limited in extension it can be useful to decide for surgical debridement with sonic instruments wich guarantees bone remodeling, first intention healing, and soft tissues respect.

Methods. Patients with small osteonecrosis areas due to extraction technique were treated. Sonic instruments were used. Surgical incision and mucoperiostal flap to expose cortical bone was elevated. It is reported a case of a female patient who was in therapy with Alendronate since year 2000. She presented osteonecrosis area in correspondence of element 43, after dental extraction. OPT and TC were requested and pharmacological prophylaxis was prescribed considering a sonic debridement to remove totally the necrotic bone. Periosteum releases were made to ensure first intention healing.

Results. Sonic instruments show a better cutting precision, with more regular and less indented margins in the osteotomic lines. Sonic surgery has been totally resolatory in this specific case.

Conclusions. Sonic debridement can be evaluated in this BRONJ cases.

The block graft: advantages and disadvantages of using lyophilized bone of bank compared of autologous bone

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Aim. Autologous bone is considered the “gold standard” between all material grafts even if it implies some limitations. First pain and complications in the donor site, then the unpredictable quality of the sampled bone, and the long surgical time. The human lyophilized bone as it is the most similar graft material when compared to autologous bone in regenerative bone augmentation in pre-implantation aims. The present study shows our clinical results using this graft material.

Methods. We have grafted 20 atrophic mandible cases with block graft using human lyophilized bone in 10 pz and autologous bone in 10 Pz. All the graft were fixed with osteosintesis screws and a post operator Rx was made at 1, 3 and 6 months.

Results and conclusions. In both cases treated with homologous bone than in those treated with autologous bone clinical outcome was excellent and allowed the subsequent implant-prosthetic rehabilitation. The degree of bone resorption was assessed radiologically with panoramic x-ray and CT. The advantages of counterpart bone are obvious: the possibility of reducing post-operative discomfort to the patient in the absence of a second surgery donor site, also thanks to the possibility of using stereolithography built models and surgical templates with three-dimensional analysis on CT, we can reduce operating time and get very accurate clinical results with a high degree of adaptability of the blocks, the essential prerequisite for a better fixation of the graft itself.

The coronectomy of mandibular third molars as an alternative procedure to complete extraction. Evaluation of the postoperative recovery

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Aim. The aim of this study was to evaluate the postoperative recovery of 33 patients treated by coronectomy of a mandibular third molar.

Methods. All the teeth have been analysed by a Cone Beam Computed Tomography and the radiographic exam pointed out a real contact between alveolar nerve and third molar roots.

Results. We performed 33 coronectomy and in no case we had any neurologic lesion of the alveolar or lingual nerve. In 10 cases, for at least 3 days, patients reported on a VAS scale scores ≥ 4 . This score corresponds to a moderate pain and for these patients we considered pain as a postoperative complication. After one week all patients became asymptomatic. Two patients developed a dry socket 15 days after surgery. The radiographic exam after 3 and 6 months pointed out root migration in 15 cases. In the other cases we noted bone regeneration superior to the retained root fragment.

Conclusions. The results of this study confirm that coronectomy could be a valid alternative to complete extraction in case of wisdom teeth with close proximity to inferior dental canal. The postoperative complications as pain and dry socket are similar to that after total excision of wisdom teeth. Radiographs every six months, in the first five years, should be done to evaluate root migration or any pathologic change.

The management of patients with hereditary angioedema in oral surgery

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Aim. Hereditary Angioedema (HAE) is an autosomal dominant condition caused by a vascular reaction induced by deficiency (type 1) or functional alteration (type 2) of the C1 inhibitor (C1-INH), an enzyme involved in the regulation of complement, contact, fibrinolytic, and coagulation systems. Clinical manifestations are represented by recurrent episodes of edema of the larynx, face, gastrointestinal tract, or extremities. Trigger factors include dental procedures and oral surgery. A protocol for the management in oral surgery of patients with HAE is reported.

Methods. The prevention of angioedema attacks primarily using C1 esterase inhibitor in two patients affected by type 1 and 2 HAE and undergoing oral surgery procedures have been evaluated.

Results and conclusions. The positive response to the reported protocol shows that in patients with a history of HAE it is important to use appropriate prophylactic measures in order to prevent acute attacks after oral surgery.

The preservation of soft and hard tissues in oral surgery operations with subsequent implant purposes

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Aim. Currently the modern dentistry provides to design and perform immediate post-extraction temporary prostheses for the patients who must be subjected to a complete or partial extraction of one or more root residues or teeth. This procedure is very important to preserve and protect soft and hard tissues by the food impact and masticatory trauma. In this work we describe a clinical case of vertical fracture on a fixed prosthesis pillar represented by the maxillary right canine, endodontically treated, that was extracted and replaced with a temporary prosthesis, immediately after the surgical operation. The future definitive rehabilitation is the placement of implant fixtures.

Methods. The patient (feminine sex, aged 43) came to our observation complaining a painful sensation reported at the maxillary right canine region, appeared while chewing. The radiographic and clinical examination induced suspicion in a vertical fracture, confirmed when the fixed prosthesis was removed. After a careful analysis of the right upper semiarch for a possible implant rehabilitation, the fractured canine (endodontically treated) was extracted, the fixed prosthesis was partially sectioned and a temporary prosthesis was positioned in the patient's oral cavity. The patient healing preserved the soft and hard tissues, with a satisfactory aesthetic aspect.

Results. The obtained results enhance the adoption of this technique with patient compliance and satisfaction.

Conclusions. The authors consider that this soft and hard tissues preservation technique in the vertical fracture surgical therapy, with subsequent implant purposes, represents a valid procedure in accordance with the proper function of the stomatognathic system.

The role of fibrinolysis in the pathogenesis of the dry socket and the inflammatory dental cyst

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Aim. The aim of this study was to identify and determine the role of the fibrinolysis mechanism in the dry socket and the inflammatory radicular cyst.

Methods. The material collected from the alveolous of 15 dry socket patients and 10 controls was analyzed with zymography, western blotting and ELISA test to identify and titrate the mediators of fibrinolysis: u-PAR, u-PA, PAI-1. From further 20 patients (17 inflammatory cysts and 3 follicular cysts) material was collected from the wall and the cavity of the cyst. This material was analyzed with zymography to identify and titrate: metalloproteinase (MMP-2, MMP-9), u-PA, u-PAR (CD87), PAI-1 inhibitors, TIMP1, TIMP2 and CD31. ELISA test and immunohistochemistry were also performed to identify CD87 (u-PAR) and CD31.

Results. In the dry sockets, an increased level of u-PA and PAI-1 was found. Furthermore, fibrinolysis activity was increased by 85% compared to controls. In the inflammatory radicular cyst, an increased activity of MMP2 and MMP9 was found. Immunohistochemistry showed the presence of u-PAR in the epithelium of the follicular cyst and in the epithelium and connective tissue of the inflammatory cyst.

Conclusions. These data confirm the role of the fibrinolysis mechanism in the degradation of ECM. Degradation in the dry socket is due to elevated levels of PAI-1 (competing with ECM vitronectin thus stopping the healing process) while in inflammatory cysts is due to high levels of u-PAR in the epithelium and of metalloproteinase produced by inflammatory cells.

The role of Pericranium in the Prevention of Wound Complication and Implant Survival following Reconstruction of severely deficient edentulous Ridges

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Aim. To evaluate the influence of pericranium used for the coverage of autogenous bone grafts for the reconstruction of severely atrophic jaws on: a) the incidence of wound dehiscences; b) the survival rate of implants placed in the reconstructed areas; c) the peri-implant bone resorption.

Methods. 33 patients presenting with severely atrophied edentulous ridges were reconstructed with autogenous bone blocks. In 16 patients (control group) the grafts were covered with a collagen membrane, while in 17 patients (test group) a layer of pericranium was placed over the collagen membranes covering the bone blocks. Four to 6 months later, 152 implants were placed in the reconstructed areas and prosthetic rehabilitation was started 3 to 4 months afterwards. The mean follow-up of patients after the start of prosthetic loading was 21,5 months.

Results. the incidence of dehiscences was 6% in the test group and 13% in the control group. Peri-implant bone resorption and implant survival rates did not show statistically significant differences between the two groups.

Conclusions. the use of pericranium may reduce the incidence of dehiscence after reconstruction of atrophic ridges, while it seems to have no effect on peri-implant bone resorption and survival rate of implants placed in the reconstructed areas. Key words: atrophy, oral implant, pericranium, reconstruction, bone graft, membrane, dehiscence.

The role of PRF in oral soft tissue healing after GBR: cases report

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Guided bone regeneration (GBR) has been subject, in last few years, of an exceptional applicative expansion and it can, nowadays, depend on several ever more innovative knowledge and methodologies, as PRF. Platelet-rich fibrin (PRF) by Choukroun's technique is derived from an autogenous preparation of concentrated platelets without any manipulation. When delicately pressed between 2 gauzes, the PRF clot becomes a strong membrane with high potential in clinical application. In fact, scientific literature reports a lot of studies in which is demonstrated an important role of PRF in stimulating hard oral tissue proliferation and differentiation, often in comparison with better known PRP capacities. In this study are reported some cases able to show the PRF potential in soft tissues healing.

The use of piezosurgery during the maxillary sinus lift: clinical results of 40 consecutive cases

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Aim. The piezoelectric technique was developed as an alternative approach for the sinus elevation procedure, partially replacing conventional manual and motorised instruments. The aim of this study was to evaluate the performance of piezoelectric devices during maxillary sinus floor elevation, to determine the percentage of Schneiderian membrane perforation and the time required to perform the antrostomy and the elevation of the membrane.

Methods. A total of 35 patients and 40 grafted sinuses were included. The maxillary sinus osteotomy and the membrane elevation were performed using Easy Surgery (BioSAFIN, Ancona, Italy). At 2 months, computed tomography was performed to evaluate the outcome of the surgical procedure. The parameters recorded were: bony window length and height, bone thickness and osteotomy area, operative time and number of perforations.

Results. Seven (17.5%) membrane perforations were observed, which were repaired with resorbable membrane (OsteoBiol, Evolution, Tecnos, Coazze (TO), Italy). The average length of the osteotomy was 13.8 ± 2.9 mm; its height was 6.9 ± 1.4 mm, and its thickness was 1.4 ± 0.4 mm. The mean osteotomy area was 96.8 ± 32.2 mm². The mean time necessary for the osteotomy and the sinus membrane elevation it was 10.3 ± 2.1 min.

Conclusions. The present study demonstrated that a piezoelectric device could be an attractive alternative for a successful sinus lift augmentation.

Third molars and periodontal diseases: prevention and treatment of intrabony defects distal to second molars - a literary review

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Aim. The aim of this work is to review the literature associated with impacted third molars- related periodontal complications to identified the variables involved into the development, progression and treatment of these clinical situation.

Methods. Using a Pub Med literature search, review papers and publications retrieved for the last ten years have been identified using the key words: third molars AND periodontal disease. Only Systematic Reviews and RCT in English have been reviewed. In the work were included: 6 systematic reviews, 22 RCT and 7 Retrospective Studies divided into three areas: general aspects, periodontal disease and regenerative therapy.

Results. The results showed that few possible risk indicators for residual dental pockets have been identified such as age, inclination of third molar, large contact area, visible plaque distal to second molar and pathologically widened follicle of third molar. Different incision, flap and suture techniques have been compared but there are still conflicting results. Recently Authors focused their attention to evaluate the long term efficacy of different regenerative approaches to prevent periodontal complications or to treat these defects at a later time but data reported are frequently conflicting.

Conclusions. More investigation are still required to confirm the variables involved in the pathology and to define both the optimal prevention strategy and the best surgical treatment such as the timing of intervention.

Tissue Engineering strategies for the in vitro reconstruction of a dental pulp-like tissue: role of dental pulp stem cells and growth factors

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Aim. The most important function of dental pulp is to provide vitality to the tooth by supplying minerals and organic material. Injured pulpal tissue could undergo necrosis inducing the need of endodontic and reconstructive treatment or extraction of the involved tooth. In light to maintain a healthy pulp in prosthetic and restorative procedures several mechanical strategies have been developed but up to now 3D in vitro biological approaches have never been applied. Aim of the present work is the in vitro reconstruction of a dental pulp-like tissue combining tissue engineering strategies with dental pulp stem cells biology as predictive tool for cytotoxicity testing.

Methods. Human derived Dental pulp stem cells (DPSc) were seeded onto hyaluronan based scaffold and cultured up to 21 days in presence of differentiative medium enriched with neuronal and endothelial growth factors. Histological and molecular analyses have been performed at 3, 7, 14, 21 days after differentiation with the aim to follow the organization of the extracellular matrix and the neuronal and endothelial commitment of the cells.

Results. Morphological analyses demonstrated that DPSc are distributed both on top and within the three-dimensional construct; in particular DPSc growth well inside the scaffolds, filling all the spaces between the fibers. Immunohistological staining and gene expression for the principal neuronal, endothelial, and extracellular matrix components confirmed the correct commitment of the cells.

Conclusions. Tissue engineering strategies ensure the in vitro reconstruction of a dental pulp-like tissue with biological characteristics very close to that of a natural pulp tissue. This strategy may represent an innovative tool for both the in vitro studies of dental architecture development and as screening tools for cytotoxicity.

Total rehabilitation, toronto on 6 maxillary implants placed after bilateral sinus lift and toronto on 5 interforaminal immediate load implants: a case report

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Aim. Edentulous patients who wear full dentures for many years may present severe atrophy of the jaws.

Methods. Upper denture wearer presented extreme alveolar resorption on the maxilla and good bone quantity on the anterior mandible. A bilateral maxillary sinus lift was performed using homologous bone and tricalcium phosphate on the left side, on the right side was added also PRP (platelet-rich-plasma). At 12 months a CT Dentascan was performed and a stereolithographic model was built to plan the insertion of 6 implants (Straumann SLA Active®) on the maxilla. In interforaminal area was inserted 5 immediate load implants (Defecon-Phibo TSA®). Patient has worn the final restoration after eight months.

Results. ISQ value at insertion, during the first year and at follow-up, showed osteointegration of the inferior implants. Bone at grafted sites demonstrated good mechanical properties during bone drilling allowing a good primary stability of six implants. Normal resorption of bone around the neck of implants was found and no failure was reported. At 2 years patient was completely satisfied with the prosthetics solution.

Conclusions. To rehabilitate edentulous patients that present severe atrophy of the jaws, today we have predictable protocols of regenerative techniques associated to implants therapy, but a proper planning of treatment both surgically and both prosthetically, represent the "condicio sine qua non" is not possible to reach optimal results.

Treatment of intrabony defects after impacted mandibular third molar removal with resorbable and non-resorbable membranes

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Aim. This study compared the healing of periodontal intrabony defects at the distal surface of the mandibular second molar (M2), following third molar (M3) removal, using resorbable and non-resorbable membranes.

Methods. Eleven patients with bilateral pocket depth ≥ 6 mm distal to mandibular M2 and intrabony defect ≥ 3 mm, related to total impaction of M3, were treated with third molar extraction, covering the surgical bone defect with a resorbable collagen barrier on one side and a non-resorbable polytetrafluoroethylene (e-PTFE) barrier contralaterally. The probing pocket depth (PPD), probing attachment level (PAL), M2 molar mobility, and grade of furcation probing were evaluated preoperatively, and 3, 6, and 9 months postoperatively. Intraoral periapical radiographs were taken preoperatively, immediately and at 3 and 9 months postoperatively.

Results. Both treatment modalities were successful. At 9 months, the mean PPD reduction was 5.2 ± 3.9 mm for resorbable sites and 5.5 ± 3.0 mm for non-resorbable sites; the PAL gain was 5.9 ± 3.3 and 5.5 ± 3.4 mm, respectively. The outcome difference between the two sites for both PPD and PAL did not differ statistically ($p > 0.05$) at any assessment time (3, 6, 9 months).

Conclusions. Resorbable collagen membranes in guided tissue regeneration treatment of intrabony defects distally to mandibular M2 obtained the same marked PPD reduction and PAL gain as non-resorbable e-PTFE membranes following third molar extraction.

Treatment of voluminous cavernous intramuscular oral hemangiomas with diode laser

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Aim. Evaluate efficacy of diode laser for treating voluminous cavernous intramuscular hemangiomas of the oral cavity, on 8 different clinical cases.

Methods. We considered 8 voluminous cavernous intramuscular hemangiomas of the oral cavity: two on the tongue, two on the cheek mucosa, two on the gums and two on the soft palate. Each patient was treated in conscious medical sedation with loco-regional anesthesia using gallium arsenide diode laser (λ 800 nm). It was used with variable but high power (15-24W) and pulsed mode (on 190-250 ms/off 250-450 ms), without contact to the tissue. The laser application was preceded by cooling of the treated site, using cold packs, to avoid the tissue damage. All the patients were followed after the procedure. The study involved an histological evaluation of the lesions.

Results. Diode laser therapy didn't show intra or post-operative adverse effects, including bleeding and scarring; just the 30% of the total cases developed a post-operative slight edema. All patients demonstrated an excellent healing of the lesions: 6 patients after a single laser session, only 2 patients needed another session to heal. The histological evaluation showed an immediate vascular collapse, associated with endothelial coagulation.

Conclusions. Diode laser is safe and effective for use on voluminous vascular lesions, with minimal discomfort of the patients.

Tumefazione mascellare quale primo sintomo di linfoma non-Hodgkin

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I linfoma Non-Hodgkin (NHL) localizzati alla regione testa-collo sono un gruppo di neoplasie maligne caratterizzate dalla proliferazione di cellule linfoidi o di loro precursori. Manifestazioni extranodali primarie di NHL al cavo orale sono di raro riscontro; viceversa risultano secondarie ad un diffuso coinvolgimento dell'organismo. Sebbene, come accennato, una manifestazione primaria al cavo orale sia rara, è importante non sottovalutare lesioni che possono rappresentare il primo sintomo di un NHL. Il nostro lavoro descrive un caso inusuale di NHL extranodale in un uomo di 48 anni che presenta una tumefazione mascellare quale primo ed unico segno di linfoma Non-Hodgkin. La biopsia escissionale della lesione mostrava una composizione neoplastica di linfociti con la formazione di follicoli linfoidi che era indicativa di un centro follicolare di cellule linfomatoide del tipo NHL. Gli autori sottolineano l'importanza di accurate indagini cliniche e di procedure diagnostiche di laboratorio adeguate per scongiurare diagnosi tardive o strategie terapeutiche inappropriate.

Underwood SEPTA: radiology and surgical strategies. Case reports

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Aim. The lateral window approach to maxillary sinus augmentation is a well-accepted treatment option in implant dentistry. The most frequent complication reported with traditional techniques has been the perforation of the Schneiderian membrane, with perforation rates ranging from 11% to 56%. Surgical complications during sinus floor elevation are frequently caused by septa in the maxillary sinus. The purpose of this study is to present some clinical cases of Underwood septa to illustrate 3D radiographic imaging and surgical strategies to prevent incidents during sinus lift procedures such as membrane perforation. The incidence, location and morphology of antral septa are presented in according to datas of the literature.

Methods. Some clinical cases are presented to illustrate radiographic visualization and intraoperative management of maxillary sinus septa. The use of piezoelectric surgery and of new biomaterials radically simplifies maxillary sinus surgery, thus avoiding perforating the membrane.

Results and conclusions. In view of the fact that septa of various heights and courses can develop in all parts of the maxillary sinus, timely and adequate assessment of the inner aspect of the maxillary sinus is essential to avoid complications during sinus augmentation procedures. These retrospective cases series confirmed that a lateral window approach to sinus elevation incorporating piezoelectric technology in conjunction with hand instrumentation was an effective means to achieve sinus elevation while minimizing the potential for intraoperative complications.

Update on the therapeutic approaches to BRONJ

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In this study we have reviewed the recent researches about the therapeutic approaches to BRONJ. The patients with BRONJ respond less predictably to the established treatment for non-BP-related osteomyelitis or osteoradionecrosis and the surgical debridement of the osteonecrotic lesion is variably effective. Because it may be difficult to obtain a surgical margin with viable bleeding bone and, then, remove completely the necrotic bone, different approaches were proposed, in order to delay the surgical treatment or the complete remission from the disease. The following strategies were considered: antibiotic/antimicrobial administration, teriparatide administration, laser therapy and others. From the results of this literature review that the expectant treatment is a safe approach, because allows to reduce the symptomatology awaiting the formation of bone sequestrum. In fact, simple removal of sequestrum may be resolutive. The surgical debridement, besides, is not delayed for the patients with serious pain, refractory to pharmacological therapy and in patients with fractures or at mandible fracture risk.

Use of platelet-rich plasma in the treatment of bisphosphonate - related osteonecrosis of the jaw in multiple myeloma patients: a case series

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Bisphosphonates, one of the most frequently prescribed classes of drugs worldwide, are compounds used in the treatment of various metabolic and malignant bone diseases and they have been associated with increased risk for the appearance of osteonecrosis of the jaw (ONJ) in the last 10 years. The purpose of this study is to value the effect of Platelet-Rich Plasma (PRP) added to conservative surgery treatment in multiple myeloma patients in therapy with Zometa® or Aredia® followed by Zometa® affected by ONJ after teeth extractions. The study included 7 patients divided in 2 groups: the treatment for the first group included conservative surgery, instead, for the second one to conservative treatment was added PRP. Postoperative follow-up consisted of 3 months and because there is no standard treatment modality in controlling this upcoming problem PRP should be considered as an effective and useful integration to existing therapies when treating ONJ.

Use of ultrasound device in the immediate loading single-tooth dental implants in immediate post-extractive sockets with acute or chronic infection

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Aim. Acute or chronic periapical lesions are often cause of tooth extraction. In literature, this situation is usually considered as a risk factor for implantology. The use of ultrasound devices may be useful to operate in such situations. In fact, one of the main Piezosurgery®'s features is the physical phenomenon of cavitation: ultrasound have an important antibacterial effect and remove detritus from the cutting area. The aim of the study is to evaluate the effectiveness of oxygenation by Piezosurgery® in immediate loading single tooth dental implants in immediate post-extractive sockets with acute or cronic infection.

Methods. 20 patients received 20 immediate loading single-tooth dental implants in immediate post-extractive sockets with acute or chronic infection (13 in maxilla and 7 in mandible). Piezosurgery® was used to clean and oxygenate post-extractive sockets. In addition the implant sites were prepared using piezoelectric bone surgery. Provisional restorations were placed 2 hours after surgery. All patients were recalled 1 year after restoration and evaluated according to parameters suggested by Albrektsson et al. Finally, an assessment of soft tissue was made. The follow-up time ranged from 12 to 18 months, with 100% implant survival rate.

Results and conclusions. Immediate loading single-tooth dental implants in immediate post-extractive sockets with acute or chronic infection can be effective if Piezosurgery® is used to clean and oxygenate post-extractive sockets.

Vertical ridge augmentation of atrophic posterior mandible using an inlay technique with a xenograft without miniscrews and miniplates

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Limited bone height in the posterior mandible can be treated with surgical procedures for bone augmentation. Purpose of this study was evaluate an inlay technique without the use of miniscrews and miniplates for stabilization of the transported bone fragments. The use of miniscrews and miniplates have been reported to increase the risk of fracture of the osteotomy segments. Nine patients were enrolled in this study. A horizontal osteotomy was performed 2-3 mm above the mandibular canal, and two oblique cuts were made using a piezosurgery device and chisels. The osteotomized segment was then raised in the coronal direction, sparing the lingual periosteum. Two miniblocks of xenograft (equine collagenated bone) without miniscrews and miniplates were inserted mesially and distally between the cranial osteotomized segment and the mandibular basal bone. The residual space was filled by particles of porcine bone. Four months later a bone trephine was used to take a bone core biopsy during preparation of the implant sites. Newly formed bone was seen in close contact with the particles of biomaterials. No gaps or connective tissue were present at the bone-biomaterial interface. Histomorphometry demonstrated that $44\pm 2.1\%$ of the specimen was composed by newly formed bone, $18\pm 0.8\%$ by marrow spaces, and $33\pm 2.4\%$ by the residual grafted biomaterial. The rigidity of the equine collagenated bone allowed to eliminate the use of miniscrews and miniplates and allowed maintenance of the space.

ORTHODONTICS

3D virtual orthodontic-surgical planning

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Aim. 3D virtual orthodontic surgical planning based on interface CBCT-digital model.

Methods. Optical scanning of stone casts is performed by a structured light scanner. For proper overlap of the digital model to CBCT was created a wax bite with three landmarks, worn by the patient during the execution of CBCT and interposed between the arches of stone casts during the scan. Software recognizes the balls (landmarks) present on CBCT, identifies the diameter and overlaps this with the balls on the model, with a margin of error of less than 0.1 millimeter. Once images are acquired and coordinated, any type of analysis is possible. Software used have segmentation tools that allows to separate the maxillofacial complex by mandible and that allows the clinician to simulate the movements and to determine the displacement in millimeters for the correction of dysgnathia.

Results. With three-dimensional images orthognathic surgery and craniofacial benefits already in the diagnostic phase. With the introduction of Cone Beam CT scan, the clinician has acquired the ability to realize the volume of the skull, obtaining all the data related to it, the clinician has won a three-dimensional.

Conclusions. Programming the operation with the help of computer, integrated with dedicated software, makes the procedure faster, repeatable and particularly precise, contrary to traditional techniques that are operator-dependent and, by definition, subjected to inaccuracy.

3D vs 2D cephalometry

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Aim. Propose a simple, repeatable and not affected by human error method, relying on the use of computer and Cone Beam CT.

Methods. From an archive of about 500 Cone Beam CT were selected 44 cases, with a ratio of first-class symmetrical skeletal normoverbite, including 24 females and 20 males. CBCT of selected patients were processed with the software Mimics (Materialise); the real three-dimensional cephalometry is created, providing 18 points, including 10 middle and 8 side counterparts, identified on a CT slide hard tissue and subsequently verified on the two remaining and the rendering of the volume generated by the software Mimics. From these 18 points arise 36 measurements, which provide sagittal, vertical and transverse information.

Results. Size and homogeneity of the sample and the characteristics of the presented method allow to define new benchmarks, computable from the analysis of results.

Conclusions. Three dimension can achieve better results and with significant advantages compared with the traditional technique, in terms of effective representation of reality, less chance of error due to human intervention, absence of overlapping of anatomical structures and, above all, the possibility to work directly with a three-dimension image.

A comparison between bite jumping appliance and function regulator in Class II malocclusion

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The purpose of this study is to analyse and compare the skeletal, dental and aesthetic effects produced by two types of functional appliance in Class II skeletal malocclusion subjects: the bite-jumping appliance (BJA) and the function regulator (FR-2). The subjects consisted of 20 patients, with an age between 7 and 11 years at the beginning of treatment. All presented with a skeletal and dental class II division 1 malocclusion and a cervical vertebral maturation (CVM) between CVSM II e CVSM III according to Baccetti's method. The sample was divided in 2 groups following a randomized policy. The first group was treated with VDP appliance (mean age 8.42), the second one with FR-2 (mean age 10.4). Lateral cephalometric head films had been obtained at the beginning and after 6 months of treatment. ANOVA tests were used to find out statistically significant correlations ($P < 0.05$). An increase in lower facial height was noted in both treatment groups, the changes in maxillary development are minimal, associated to a light improvement of soft tissues. The results demonstrate that the FR-2 produced a statistically significant decrease of the overjet, associated to a lingual inclination of lower incisors. Therefore it was concluded that after 6 months of FR-2 and VDP therapy the correction of Class II malocclusion is primarily dento-alveolar, with a smaller participation of skeletal changes.

A new aesthetic cephalometric analysis of the profile

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We report a new cephalometric method analysis, based on the old Pancherz exam, to evaluate the profile of the patients. Like the Pancherz's in fact the new cephalometric analysis need 3 reference lines: NSL (nasion-sella line) this line was used for orientation of all head films; OL (Occlusal line) a line through is and the distobuccal cusp of maxillary permanent first molar. The line from initial head films was used as a reference line for measurements on all head films, OLp (Occlusal line perpendiculare) a line perpendicular to OL through S. Such the OL, OLp was used as a reference line for measurements on all head films. All registrations were done parallel with OL to OLp. Our cephalometric analysis found 6 distances on the facial profile: OLp-Prn to evaluate the nose prominence point, OLp-Sn to evaluate the subnasal point, OLp-Ls to evaluate the superior lip point, OLp-Li to evaluate the inferior lip point, OLp-Sm to evaluate mandibular's ridge point and OLp-Pos to evaluate soft tissue's pogonion. For a critical analysis we combined these registrations with others 5 records: A-Sn, Is-Ls, li-Li and Po-Pos to establish the thickness of soft tissues. Finally we found Arnett convexity angle (G-Sn-Pg) as the angular parameter. This new cephalometric method for aesthetic profile analysis enables the simple rapid and efficient study of the main facial structures.

A new methodological and clinical approach for the treatment of upper lateral incisors agenesis: the posterior space opening

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Aim. The aim of this study is to conceive and apply a new methodological approach for the treatment of upper lateral incisors agenesis. This approach aims to be the “Third Way”, going beyond the other classical techniques in the scientific literature (anterior space closure or opening), safeguarding the occlusal integrity and the dental and periodontal aesthetics of the anterior frontal group.

Methods. A systematic literature review has been done to analyze the current techniques for the treatment of this agenesis. A new approach has been conceived by means of the anterior space closure, with the mesialization of the canine and the bicuspids, combined with a posterior space opening with an eventual molar distalization, accordingly to the occlusal needs of the malocclusion treatment. In this way we can create adequate room for the placement of an implant in the second premolar area.

Results. the final results are a correct tooth alignment with class I molar relationship; the presence of natural teeth in the frontal group; an excellent dental and periodontal aesthetic right after the orthodontic treatment; the eventual implant is located in the non-aesthetically-so relevant posterior area; the occlusal integrity is preserved. Clinical cases demonstrate the above.

Conclusions. a critical analysis of posterior space opening shows how is possible to gather the advantages from the previous techniques, excluding at the same time the majority of their drawbacks.

A three-brackets experimental model for the evaluation of forces exerted by NiTi wires

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Aim. The aim of this study was to analyze the effects of the bracket system, the wire type and the deflection level on the mechanical performances of different NiTi wires.

Methods. A three-brackets experimental model was used to simulate a vertical displacement of a maxillary canine. Three different bracket systems were used: passive self-ligating brackets, active self-ligating brackets and conventional brackets with elastomeric ligatures. Each system was tested in combination with two kinds of NiTi wires of the same size 0.014-in: a superelastic wire and a thermal wire. Load-deflection tests were performed on the wires subjected to 2 and 4 mm of deflection at constant temperature of 36 °C.

Results. Analysis of variance showed that the bracket system, the wire type and the wire deflection had a significant effect on the deactivation forces produced ($P < 0.05$). By testing Vision brackets, significantly higher deactivation forces were recorded at both 2 and 4 mm of deflection. In contrast, the lowest forces were showed by conventional brackets in all tests, due to the greater friction. Thermal wires exerted forces significantly lower than the superelastic wires in all the combinations with brackets. In the unloading phase a statistically significant decrease of the forces of NiTi wires with increasing wire deflection was observed.

Conclusions. The forces of NiTi wire are significantly dependent on the various combinations of brackets and orthodontic wires.

Adenoid hypertrophy and tonsillar hypertrophy: effects on maxillary and mandibular growth

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Aim. to evaluate the differences in maxillary and mandibular dimension, position and growth direction between children with adenoid hypertrophy and children with tonsillar hypertrophy.

Methods. 20 patients with adenoid hypertrophy (AG), mean age 8,4 years, 20 subjects with tonsillar hypertrophy (TG), mean age 8,2 years and 20 patients with adeno-tonsillar hypertrophy (ATG), mean age 8,3 years, were selected. A control group (CG) of 20 children with no adenoids or tonsils obstructing the airways, mean age 8,4 years, was also obtained. A sagittal, vertical, dental and growth direction cephalometric analysis was conducted for each group. Tukey's post hoc comparisons test was used to compare the angular and linear measurements.

Results. no significant differences were observed between AG and CG. TG had smaller ANB and OVJ values and a larger SNB and ArGn values when compared to both CG and AG. TG showed larger $N^{\perp}PF-Pg$, $Pg-OLP$, GoMe, ArGo measures and smaller $NS^{\wedge}SGn$ angle than AG. ATG had smaller ANB angle and larger ArGn value in comparison with CG and AG, smaller SNB angle and a larger $NS^{\wedge}SGn$ angle with respect to TG and larger $Pg-OLP$ and GoMe measures when compared to AG.

Conclusions. tonsillar obstruction produces a smaller discrepancy between maxilla and mandible, an increased length of the mandibular body and a more anterior mandibular position with a horizontal growth direction than adenoid obstruction.

Adolescent idiopathic scoliosis: prevalence of reverse chewing cycles

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Aim. Reverse sequencing chewing cycles are dyskinetic chewing patterns occurring with high frequency in patients with a unilateral posterior crossbite during chewing on the affected side. The unilateral posterior crossbite is an asymmetric malocclusion characterized by a severe asymmetry of masticatory function. It can be associated with Adolescent Idiopathic Scoliosis (AIS). The interest in this case report is the evaluation of the reverse sequencing cycles in an adolescent girl with a severe AIS.

Methods. A 10.3-year-old girl, with a thoraco-lumbar left convex scoliosis, a Cobb angle of 25°, a normal left and right molar relationship and the inclusion of the left lower lateral incisor, underwent the chewing cycles recording, with soft and hard bolus, with a Kinesiograph (K7-I Myotronics Tukwila, WA, USA) interfaced with a computer.

Results. The results showed a high percentage of reverse chewing patterns, during chewing on the side of the impacted tooth only, which is the side of the scoliosis also. This very unusual result is not due to the dental occlusion in the frontal plane, because of the absence of a unilateral posterior crossbite. One hypothesis of this asymmetry of mastication might be due to the asymmetry of the peripheral inputs coming from the spinal column with a thoraco-lumbar left convex scoliosis.

Conclusions. In this case report, for the first time, it has been demonstrated that the body posture may have an important influence on the masticatory function.

Advantages of self-ligating fixtures in frictional mechanics

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Fondazione IRCCS Cà Granda - Università degli studi di Milano

Aim. In this study has been analyzed the use of self-ligating fixture.

Methods. Introducing an adult patient orthodontically treated with self ligating method.

Results. In this study we observed that this method reduces the frictional forces that avoids sliding movement and shortens treatment duration. It ensures a good control of tip, torque and rotational movements. It is also well accepted by patients because of its little mesio-distal dimension.

Conclusions. Between different fixtures which use sliding mechanics, self-ligating type offer multiple advantages.

Aesthetic and structural analysis of skeletal class III malocclusion: comparison between Fränkel III and modified SEC III in growing children

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The aim of this study was to compare skeletal and dental effects of two functional devices: Fränkel III and modified SEC III. We used SEC III with two splints and class III elastics and without chin-cup to avoid potential TMJ damages. We included 20 patients with skeletal class III malocclusion (9 males and 11 females); they were 7,25 years old on average, at the beginning of the study. 10 patients were treated by Fränkel III and 10 patients were treated by modified SEC III. We instructed every patient to wear functional devices at least 18 hours a day. We evaluated (at the beginning of our study and after a six month follow-up) skeletal effects of our two devices using cephalometric analysis of Illinois, and aesthetic effects using important parameters explained in Prof Cozza's manual. At the end, we performed ANOVA test to demonstrate therapies' effectiveness. Every child showed dental effects (such as vestibular inclination of upper incisors) but few skeletal effects. Moreover, in modified SEC III group, we observed a statistically significant ($P < 0.05$) improvement of "total facial profile angle". This is the first RCT comparing these two devices, but it has to be considered as a preliminary study because of the observation's shortness. Anymore, our results confirmed that skeletal effects on maxilla are possible in very young people.

Aesthetic evaluation in patients treated for lip and palatal cleft

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Aim. To evaluate static and dynamic aesthetic in patients treated for lip and palatal cleft.

Methods. Photographs and dynamic measurements of patients of the study and control group were taken. Anthropometric measurements were made and documentation has been analyzed by a committee.

Results. The survey shows a different conformation of the upper lip of the patients analyzed. In patients with cleft the most affected portion is the vermilion of the upper lip. Patients with cleft show greater asymmetry in movement, while patients with bilateral cleft show greater overall symmetry.

Conclusions. The upper lip in patients with cleft is different from the one of the control group with the same age, sex and ethnicity. Surgical correction of cleft lip not always gives a normal appearance. The cleft side is more strongly asymmetric during movement. Patients with bilateral cleft also show less asymmetry in dynamic vision.

Analysis on dimensional variation of dental arches by using low friction bindings

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Aim. This study analyses the expansive capacities of the new low friction binding system, compared with the conventional elastomeric binding system.

Methods. 12 young people aged between 11 and 14 have been counted among the patients, who have skeletal malocclusion of Class II or III and with slight to moderate crowding of teeth, with no need of tooth extraction. The participants have been divided into two groups of 6: the first group has been treated with conventional elastomeric bindings, the second with low friction bindings, always using 0.14 NiTi arches and conventional stainless steel brackets. All the patients have been submitted to periodical check-ups

Results. After 90 days the changes of the following parameters have been evaluated: intercanine distance, interpremolar and intermolar distance, dental arch length and perimeter. It has been found that the patients with low friction bindings show a greater increase of the interpremolar distance, while the patients with elastomeric bindings show a greater increase of the intermolar distance and of the dental arch length and perimeter; the latter have also showed a slightly greater increase of the intercanine distance.

Discussion. As low friction dental braces do not alter the biological bone-periodontium-teeth system, they would allow a physiological movement of the teeth with the bone and a remodelling of the arch dimension.

Arnold-Chiari's syndrome: interdisciplinary evaluation of instrumental diagnosis in dental area

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Aim. The appliance of instrumental diagnosis on patients suffering from Idiopathic Juvenile Arthritis permits to discover diseases which aren't within competence of dental subject, making possible to do an early diagnosis, even without any symptoms.

Methods. We present a case report about a 20 years old patient with previous IJA for an exacerbation of articular pains. It has been requested a cranium CT Cone Beam, by means of we noticed a central erosion of both condyles, so much that they acquired a forked profile. To evaluate the condition of the articular meniscus, we requested the execution of NMR exam.

Results. The radiological report pointed out, in addition to an articular meniscus erosion, a 14 mm prolapse of cerebellums tonsils under occipital's foramen. This is a characteristic sign of Arnold-Chiari Syndrome. The patient, even being asymptomatic, has been sent to the neurosurgery department for a more accurate investigation and to evaluate the chance of a surgical treatment.

Conclusions. It results to be necessary to have an interdisciplinary approach to instrumental analyses that could permit an early diagnosis which is not otherwise possible in asymptomatic forms.

Association between Non-Syndromic Ipodontia and skeletal defects on the three space dimensions

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Aim. Ipodontia can appear both as an isolated condition (non syndromic ipodontia) and as a condition associated with other congenital syndromes (syndromic ipodontia) such as Christ-Siemens-Touraine syndrome or cleft palate. Gianni refers that ipodontia can be present as agenetic, microdontic and iatrogen form. All these forms show a reduction of the skeletal vertical dimension. Microdontic form shows an orthognatic growth with tendence to horizontal. Gianni reports also that agenesis are found frequently in cases of skeletal III class, with adenoid face, ipoplasia of maxilla and profile tending to concave. The aim of this work is to examine the most recent literature to verify Gianni's hypothesis regarding the skeletal development on sagittal, vertical and trasversal plane in patients with non-sindromic ipodontia.

Methods. A systematic review of years 2010 and 2011 literature has been performed. Studies regarding syndromic forms have been excluded from the study. Articles in Italian or English have been selected. The following databases have been searched: Pubmed (Medline), Cochrane Library, NHS.

Results. Two studies satisfied the election criterias. These studies show a greater prevalence of ipodontia in patients with class III malocclusion and a bigger incidence of agenesis at maxillary level. There is no statistical difference in the vertical relationship beetween maxilla and mandible, while intercanine and intermolar distances are significantly diminished both for maxilla and for mandible if compared with control groups.

Conclusions. Results. show a higher prevalence of ipodontia on maxilla and in III class subjects. No alteration of vertical relationship is shown but modifies on trasversal diameters are found.

Banded RME vs RME bonded

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Aim. Compare, using lateral-viewed radiography, between the cephalometric values registered before and after the treatment with banded rme and with bonded rme. We wanted to evaluate if there were significant differences of vertical, saggital and transversal dimension after the activation of these two appliances.

Methods. Were selected 60 patients (30 males and 30 females) between 6 and 15 years with lateral-posterior crossbite caused by maxillary hypoplasia. They were divided in 2 groups of 30 patients each (15 males and 15 females). We treated the first with a Hyrax palatal expensor, banded on first superior molars and on deciduous second premolars. The second group was treated with a bonded rapid palatal expensor.

Results. Patients treated with Hyrax RME did not show statistically significant modifications of the saggittal position of maxilla, mandibular and skeletal class, but there was a significant increase of cranio-spinal angle due to the post-rotation of bispinal plane and to the increasing of cranio-mandibular angle. In the group with bonded RME, SNB angle significantly increased and cranio-mandibular angle was reduced. There was any modification in values of SNA, ANB, SN-SNP, SNA.

Conclusions. with both the appliances it's possible to obtain the same trasversal expansion of palatine suture. In patients with increased anterior vertical dimension we observed that bonded RME allows a better control on vertical plane.

Biofrankel 3 in the orthodontic-orthopaedic interceptive therapy of class III dento-skeletal malocclusions

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Aim. The aim of this study is a review of the literature on the orthopaedic functional devices effectiveness for the class III dentoskeletal malocclusion correction and report our clinical experience with Biofrankel 3, comparing the results obtained with a control group.

Methods. 18 patients with a mean age of 7,3 years (range 6,8-8,6 ys) were treated with Biofrankel 3 for a mean period of 2,1 ys. 20 patients were included in the control group (mean age 7,8 ys). The patients were evaluated by clinical examination, X-ray orthopantomography and lateral X-ray telecranium pre and post-treatment. Two-tailed t-tests were used to find out statistically significant correlations.

Results. The mean increment of SNA angle was 1,63° in the treatment group and 0,26° in the control group ($p < 0,0001$). The mean increment of SNB angle was 0,03° in the treatment group and 0,19° in the control group ($p = 0,53$). The mean increment of ANB angle was 1,49° in the treatment group and 0,05° in the control group ($p = 0,0001$). The differences noticed depend on the auxologic category of the patients.

Conclusions. The Biofrankel 3, joining the principles of the Frankel 3 and the Bionator 3, showed in comparison better effectiveness, in particular in the maxillary sagittal advancement.

Biological behavior of miniscrews under different types of load: a systematic review of the experimental literature in animals

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Aim. The aim of this study was to review the experimental literature about functional and biological tissue reactions around orthodontically loaded miniscrew implants.

Methods. Data were collected from Pubmed electronic database and reference citations were searched in published articles from 2007. Inclusion criteria were animal studies about orthodontically loaded miniscrews. 10 articles investigating various types of screws were identified. Data about healing time, force application, stability, tooth movements, side effects and osseointegration were collected.

Results. Healing period ranged from 0 to 12 weeks, forces ranged from 25 to 900 gr. Implant stability was achieved with no severe side effects. No significant differences in tooth movements were observed between immediate and delayed loading, at 25 or 50 g of force, or between the maxilla and the mandible. Osseointegration showed a tendency to increase with loading time. No significant difference in bone-screw contact was found between loaded and unloaded screw implants, or between tension and pressure sides of loaded implants.

Conclusions. success rate was higher than those in humans and ranged from 90 % to 100 %, partially depending on amount of screw load. Higher loads showed higher tendency to screw displacement.

Biometric study about dimension of ectopic buccal maxillary canines

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Ectopic buccal eruption of maxillary canines is one of the most frequently encountered conditions in orthodontic practice. The aim of the present study was to investigate the connection between the presence of buccal displaced canines (BDC) and the existence of a variation in the size of the teeth in the maxilla. The experimental sample consisted of 52 subjects (28 females and 24 males), aged 11 – 15 years (mean 13.6 ± 1.2 years) showing bilateral buccal eruption of maxillary canines. These patients were compared with a control group of 52 treated patients (24 males and 28 females) of the same age with normally erupted and undisplaced maxillary canines. Both mesiodistal and buccolingual tooth dimensions were measured directly on the dental casts, using a dial caliper with ground tips. The differences between the BDC group and controls were determined using a Student's t -test. P values less than 0.05 were considered significant. The results revealed a sexual dimorphism. Larger-than-average teeth were present in BDC females, whereas the teeth in BDC males were normally sized. It is concluded that in subjects with BDC there are differences in teeth dimensions between the two sexes.

Bone lesions in patient with open-bite

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Aim. In this work we report maxilla's clinical manifestations of a patients affected of McCune-Albright Syndrome (MAS) and consequent Orthodontics involvements and therapy.

Methods. We report a case of male patient 8 years-old, arrived at Orthodontic Department of the University of L'Aquila to resolve a problem of anterior open-bite. In the clinical exam we observe a small swelling of left emi-maxilla in the zone corresponding to apex roots of 16 and under the gems of 14 and 15. From the Rx-OPT exam we can observe radio-opaque area in the over-mentioned zone. From the Tc-Dentascan exam we can observe dysplasic bone lesion.

Results. anterior open-bite was solved and later on, the individuation of bone lesion bring to the diagnosis of McCune-Albright Syndrome (MAS). Then the bone lesion was ablated surgically.

Conclusions. it's always useful to have diagnostic doubts about atypical clinical manifestations at the stomatognathic level, in fact often they are local signs of a systemic syndrome. The knowledge of that, is important for patient's health, and also useful during our treatment.

Caratteristiche cefalometriche dell'enuresi notturna primaria: studio polisomnografico

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Obiettivo. L'Enuresi Notturna Primaria (PNE) è una patologia multifattoriale correlata ai Disturbi Respiratori nel Sonno (SRBD). Alcuni studi hanno evidenziato alcune caratteristiche cranio-facciali predittive per SRBD in bambini enuretici. Lo scopo di questo studio è valutare la correlazione tra i disturbi respiratori nel sonno, diagnosticati e classificati dalla polisomnografia (PSG) e le caratteristiche cefalometriche in bambini con PNE.

Metodi. Il campione esaminato comprendeva 18 soggetti con PNE (12 maschi; età media 10.05 ± 2.1) e 10 soggetti sani (6 maschi) abbinati per età ($p=0.953$) e sesso ($p=0.953$). I soggetti hanno effettuato un esame polisomnografico e una teleradiografia in latero-laterale su cui è stata eseguita l'analisi cefalometrica classica e dell'orofaringe. L'analisi statistica è stata eseguita con t-test e chi-quadrato test. I dati cefalometrici sono stati inoltre correlati all'Apnea-Hypopnea Index (AHI) e all'Oxygen Desaturation Index (ODI) con il test di correlazione di Pearson.

Risultati. I soggetti enuretici hanno mostrato valori di AHI e ODI più alti (rispettivamente $p=0.001$ e $p=0.006$) e l'angolo di divergenza S-N^{Go}-Me aumentato ($p<0.001$) rispetto al gruppo controllo. I seguenti parametri erano ridotti: lunghezza della base cranica anteriore Se-N ($p=0.003$), lunghezza del corpo mandibolare Go-Pg ($p=0.018$), distanza dell'osso ioide dal piano di Francoforte AH-FH ($p=0.019$) e dalla base cranica AH-SN ($p=0.012$), lunghezza della lingua dalla base alla punta V-T ($p=0.013$). Il Pearson's test ha evidenziato una correlazione positiva statisticamente significativa tra S-N^{Go}-Me e AHI ($p=0.021$) e ODI ($p<0.001$) ed una correlazione negativa tra Se-N e AHI ($p=0.044$) e ODI ($p=0.001$), Go-Pg e AHI ($p=0.046$) e ODI ($p=0.001$), Phw1-Psp e AHI ($p=0.027$) e ODI ($p=0.043$).

Conclusioni. Alcune caratteristiche cefalometriche sono correlate al grado di disturbo respiratorio del sonno in bambini con PNE.

Cephalometric changes after RPE and facemask orthodontic treatment in growing subjects with class III malocclusion

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Aim. The aim of this study was to determine the cephalometric changes in subjects with class III malocclusion after rapid palatal expansion (RPE) and facemask treatment.

Methods. 12 subjects (7 females and 5 males, mean age 8 years and 5 months) with Angle class III dental relationship, anterior crossbite and skeletal class III relationship had undergone RPE and facemask orthodontic therapy. The average treatment time was 10 months. Cephalometric radiographs were taken prior to (T0) and after (T1) treatment and were compared using a paired Student t-test. The pre- and post-treatment observation radiographs was compared using cephalometric Tweed analysis by adding the following measurements: convexity, maxillary depth, McNamara-A point, McNamara-Pogonion.

Results. In the sagittal plane, significant changes were observed. The following dimensions increased significantly: convexity ($p<0,05$), Wits ($p<0,05$) maxillary depth ($p<0,05$); also occurred an increase of Gonion-Gnathion length ($p<0,05$). Were significantly decreased the angle measurements IMPA ($p<0,05$) and especially ANB ($p<0,001$). Only significant changes in the vertical plane was the increase of Anterior Facial Height ($p<0,05$).

Conclusions. RPE and facemask treatment produced favourable changes in the dento-facial complex in growing patients with class III dento-skeletal malocclusion. Skeletal changes was a combination of an anterior and vertical movement of the maxilla and backward and downward rotation of the mandible.

Cephalometric differential diagnosis of maxillo-mandibular sagittal relations: the ADPI of Kim

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Aim. The scope of this experimental study was to verify the validity of the ADPI proposed by Kim, confronting it with the ANB angle and Wits' index. Furthermore, it was intended to consider the correlation between these three parameters and the variations of the vertical skeletal rapports using as indicator Schudy's intermaxillary angle.

Methods. We have analysed the lateral-side x-rays from 50 subjects between the ages of 7 to 14. After having carried out the cephalometric tracing and, to evaluate the error, we have applied Dalberg's equation. The values from the various APDI measures were studied and elaborated to obtain the average and the standard deviation. Confronting the APDI values with the ANB angle we were able to evaluate the correlation matrix between ANB, Wits and APDI. The following phase was the analysis of the regression between the intermaxillary angle and the respective values of ANB, Wits and APDI.

Results. These studies have brought us to recognise a high level of correlation between APDI and the other two parameters.

Conclusions. The use of APDI should not substitute the traditional measures because it is reductive and risky, because of this one should resort to the practice of "2 out of 3" using the three forms of cephalometric tracing. Where two parameters are discordant it is always better to consider a third in order to arrive at a more correct diagnosis.

Cephalometric patterns of primary nocturnal enuresis: a polysomnographic study

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Aim. Primary Nocturnal Enuresis (PNE) is a multifactorial disease related to Sleep Related Breathing Disorders (SRBD). Studies have shown that cranio-facial pattern can be a reliable method to predict risk for SRBD in enuretic children. This study analyzed cephalometric features to verify the degree of SRBD identified by polysomnography (PSG) and to find their correlation in children with PNE.

Methods. 18 subjects with PNE (12 boys; mean age 10.05 ± 2.1) and 10 healthy children (6 boys) matched for age ($p=0.953$) and sex ($p=0.953$) were examined. Lateral cephalometric analysis including oropharyngeal evaluation and an overnight PSG were performed. The Apnea-Hypopnea Index (AHI) and Oxygen Desaturation Index (ODI) were calculated. Statistical analysis was performed by t-, chi- square, and Pearson's correlation tests.

Results. The enuretic children showed higher AHI and ODI (respectively $p=0.001$ and $p=0.006$) and increased divergency angle S-N[^]Go-Me ($p<0.001$). The following parameters were reduced: anterior cranial base length Se-N ($p=0.003$), mandibular body length Go-Pg ($p=0.018$), distance of the hyoid from Frankfort plane, AH-FH ($p=0.019$) and cranial base, AH-SN ($p=0.012$), tongue length, from base to the tip, V-T ($p=0.013$). The Pearson's analysis showed correlation between S-N[^]Go-Me and AHI ($p=0.021$) and ODI ($p<0.001$) and negative correlations between Se-N and AHI ($p=0.044$) and ODI ($p=0.001$), Go-Pg and AHI ($p=0.046$) and ODI ($p=0.001$), Phw1-Psp and AHI ($p=0.027$) and ODI ($p=0.043$).

Conclusions. Enuretic children had some cephalometric features that correlated with SRBD.

Cephalometric valuation of the efficacy of the Third Class Resolver (TCR) for the treatment of the Third Class malocclusion

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Aim. The aim of the present study was to evaluate the efficacy of the Third Class Resolver (TCR) for the resolution of the Third Class malocclusion.

Methods. Ten patients, 7.1 years old on average, affected by skeletal and dental Third Class malocclusion were included in the study. A radiographic valuation before and after the treatment was performed. The Enlow cephalometric analysis and the cephalometric analysis of the University of Chieti were performed.

Results. A statistically significant increase of ANB Angle, Wits Index, length of the mandibular ramus and body, angle between FH and upper incisive axis. In addition, was observed a statistically significant decrease of the Maxillo-Mandibular Angle, GoGn SN Angle and Upper Gonial Angle.

Conclusions. The TCR is a valid therapeutic appliance for the treatment of the Third Class and the control of the vertical dimension during the treatment.

Chewing pattern before, after and one year follow-up of an orthodontic therapy with functional appliance in a bilateral posterior cross-bite

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Aim. The aim of this work is to analyze the chewing pattern before and after orthodontic therapy with functional appliance in a patient with posterior bilateral cross-bite.

Methods. Orthodontic therapy has been carried out with a functional appliance (FGB). Chewing patterns have been recorded with K7 Myotronics Kinesiograph before therapy, six months and one year after the correction of cross-bite, both with hard and soft bolus.

Discussion and conclusions. The results showed a significant prevalence of reverse chewing cycles on the left and on the right side before therapy. Six months after the correction of cross-bite reverse cycles significantly decreased, resulting in a correction of the reverse chewing cycles of both sides. One year after, the follow up showed the stability of the functional correction and the improving of the chewing cycles. Evaluation of chewing pattern before and after therapy in this case shows that FGB can lead not only to an anatomical correction of the dentoalveolar malocclusion, but also to a rebalancing of masticatory function. Stability of anatomical and functional correction over the time will be the topic of a future poster.

Chewing patterns in anterior bite: a case report

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Aim. The aim of this study is to analyze chewing cycles in a patient with anterior open bite before and after orthodontic correction.

Methods. A 9,9 years old patient with anterior openbite has been analysed.

She has been treated with a function generating bite "FGB" with posterior bite, expansion spring and resin inferior shield such as lip bumper to correct the malocclusion. Masticatory cycles were recorded during chewing a soft (chewing-gum) and a hard (winegum) bolus with a Myotronics K7-I kinesiograph before and after openbite correction (OVB=2mm).

Results. Analysis of the masticatory cycles showed:

- Kinematic analysis: - cycles width increase (FRONTAL PLANE) -cycles physiological conformation recovery (such as "drop of water") -cycles duration increase -cycles velocity decrement/decrease
- Muscles activity: -physiological "peak" recovery (masseter and temporal EMG)

Conclusions. The evaluation of masticatory cycles before and after orthodontic treatment showed that function generating bite "FGB" has corrected both the dento-alveolar malocclusion and the function.

Chewing pattern of a unilateral posterior cross-bite and asymmetric molar class before/after correction and 3 years follow up

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Aim. The aim of the study is to analyze chewing pattern and electromyographic activity of a patient with unilateral posterior crossbite and asymmetric molar class (class II right side, class I left side), before, after therapy and 3 years follow up.

Methods. A female patient, 9,8 years old, with a right posterior unilateral crossbite and a molar class II asymmetric is reported. The correction of crossbite was obtained with the appliance "Function generating bite" (FGB) in 12 months. Therapy continued with a Schwarz appliance to correct molar asymmetric class. Functional characteristics were assessed by recording the chewing cycles, before orthodontic treatment, 6 months and 3 years after correction of crossbite.

Results. Before treatment during chewing on crossbite side 71% of chewing cycles were reverse; 6 months after correction of crossbite 19% of chewing cycles were still reverse. 3 years after correction of crossbite and asymmetric molar class chewing cycles were corrected.

Conclusions. In the case reported, to restore the masticatory function, it was necessary not only the correction of crossbite but of asymmetric molar class also.

Communication with dental patient

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Over the years the doctor-patient relationship changed, initially* was a "paternalistic" relationship in which the doctor was the only to know what would have been better to do for the patient; and then was a person at the center of the therapeutic program. The communication became more important, it was meant like an important bidirectional process representing the basic element of the society. In the modern trend to approach to a patient, we can overcome differences of roles and knowledge through the dialogue, the communication and understanding. So, to achieve this result we must do a series of questions about the communicator/sender, like: who is talking, subject matter, purpose, language, the effects and consequences of the communication; and then we must do a valuation about the receiver like sex, age, personality, social class. There are also the factors that can affect a relationship patient-doctor that may impede a communication and they can be a semantic interference, physical and technical problems about a transmission medium. The message can be transmitted with 'personal', 'impersonal' channels, or in the interpersonal modality through a "feedback", the disclosure of return; also there is a new sociologic conception of patient like a 'customer' and his gratification is most important for the prosecution of therapy. At the end, if the doctor should spend much more time, he could gather more information about a patient and reduce his errors.

Compared perception of laypeople, dentists, orthodontists and artists to smile esthetic in subjects treated with Ricketts or Roth appliances

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Aim. To assess if management of incisal torque by different preadjusted appliances could influence esthetic perception of smile and if there is any difference in smile attractiveness judged by laypersons, dentists, orthodontists and experts of art.

Methods. A panel of orthodontists IBO certified selected cases treated with Roth (RT) or Ricketts (RKT) preadjusted appliances. The panel selected cases with ideal occlusion for molar and canine class, OVB-OVJ values and optimal smile, according to scientific literature criteria for adequate smile. The smile frontal, smile lateral and the frontal intraoral photos of valid cases were judged by groups of 10 layperson, dentists, orthodontists and artists for smile attractiveness and incisor position by VAS scale. The two way ANOVA with Bonferroni post-hoc test was used for data analysis.

Results. there is no relevant difference in smile attractiveness of RT and RKT treated patients, both in frontal and lateral vision. However, all judges scored lower values for smile attractiveness in lateral vision, except for orthodontists. All panel found incisors best positioned in RT treated cases, except for artists and orthodontists, that equally judged RT and RKT patients in frontal vision. Ortho-panel scored higher values than others.

Conclusions. smile beauty is related to incisor position, although not influenced by chosen prescription, and it is differently perceived by laypeople, dentists, orthodontis and artists.

Comparison between twin-block appliance and function regulator in class II malocclusion

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The aim of this randomized clinical trial was to evaluate and compare the dentoalveolar, skeletal and aesthetic effects of the Twin-block and FR-2 appliance. Twenty-one children with class II malocclusion and the same physical growth maturation status (CMV II e CMV III) were selected for the study. The subjects were divided, following a randomized policy, among a TB group (n=10) and a FR-2 group (n=11). The T(1) to T(0) observation period was adjusted to 6 months. All the patients were evaluated by test photo and lateral cephalometric radiographs at time T0 and T1. ANOVA tests were used to find out statistically significant correlations ($P<0.05$). The appliances determined mandibular advancement and a mandibular forward rotation. The TB patients achieved an additional 3.6 mm of mandibular length, whereas the FR-2 group increased 1.46 mm. No restriction of midfacial growth was observed in either group. The FR-2 sample showed significant retroclination of the maxillary incisors, associated to a significant increase of the interincisal angle. The effect of TB on teeth position was very low; only a slight lower incisor proclination was observed. Data showed that both appliances induced an improvement of facial profile. The present RCT suggests that Class II correction, in the first 6 months, is achieved through normal growth in addition to mandibular skeletal and dentoalveolar changes.

Correlation Between Malocclusion, Posture and Ocular Convergence Disorders: an Epidemiological Investigation of 605 Genoese Elementary School Students

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In this epidemiological study, conducted with the collaboration of the local health authority (ASL 3, 1st District, School Medicine Services), 605 children from the 3rd, 4th and 5th years of seven Genoese elementary schools were examined. The parents of the children were asked to fill in an anamnestic survey regarding the children (birth, breast and/or formula feeding habits, dummy- or thumb-sucking, headaches, dental and general trauma, pain in the muscles of the head and neck, nocturnal bruxism). The questionnaire pertaining to each child was then used at the subsequent clinical following examinations: (i) Dental/occlusal; (ii) Orthoptic; (iii) Postural. The cases of unphysiological gait were found in prevalence in patients with overjet (14,70%) or overbite in (14,87%), where the percentage of patients with normal occlusion who showed unphysiological gait was 13,08%. In the ocular dominance test patients with open bite with right dominant eye were 58,42% versus 41,58% with left dominant eye. Patients with deep bite who showed a right dominant eye were 66,66% while 33,33% had left dominant eye. Patients with normal occlusion who showed right dominant eye were 62,7%, with left dominant eye were 37,3%. In line with current medical principles, which are moving towards a more holistic view of the human body, this study defined the dental malocclusion of our sample in an interdisciplinary manner and proposes a treatment made by a medical equipe.

Cranio - facial growth in patients with odontochondrodysplasia or Goldblatt syndrome

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Aim. The aim of the present study is to evaluate the dental and orofacial disorders associated to Goldblatt syndrome or odontochondrodysplasia (OCDC). We report the study performed on a female patient affected by this disease. We analyzed her dental and orofacial features, which are very significant, because there are no studies on this topic in the literature.

Methods. We adopted several diagnostic criteria: a first phase consisting of radiographic investigations, followed by rhinomanometric measurements through anterior and posterior rhinomanometry, and a final laboratory phase to determine the salivary flow from a quantitative and qualitative perspective.

Results. The results obtained after a careful clinical, anamnestic, and radiographic analysis of the female patient allowed us to identify a number of odontostomatologic features, which are very likely to be related to this syndrome.

Discussion. Our patient presented with the pathognomonic signs of OCDC already identified in the literature, that is, pectus carinatum, joint hyperextensibility, coxa valga and genu valgum, upper and lower limb asymmetry, and vertebral abnormalities. Moreover, we focused our attention on those odontostomatologic aspects that had never been analyzed by other reports in the literature: dentinogenesis imperfecta, ligamentous hyperlaxity of all joints and of temporomandibular joints in particular, poor lip competence, ogival palate, and oral respiration. Besides these, dental crowding and other important elements were identified through cephalometric measurements.

Conclusions. In the light of all these elements and of their comparison with the existing literature, it is possible to stereotype a few recurrent odontostomatologic and systemic-generalized features in patients with OCDC, which can be considered as closely associated with this syndrome.

Customized brackets: realization by CAD/CAM digital methods

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Aim. Our aim was to describe the operation of CAD / CAM technology to create customized brackets.

Methods. After the acquisition of three-dimensional models by using a scanner and a computer equipped with specific software, it creates what is called virtual orthodontic setup: the software performs segmentation of individual teeth which could achieve the vision of 3D dento-alveolar ratios. The clinician can then change the tip and torque, rotate and translate the teeth in the three planes of space, and simulate in this way, orthodontic treatment you want. According to the orthodontic setup, is then designed the brackets to custom design (CAD phase). After the design, the brackets are ready to be made by the machine tool (step CAM).

Results. Technological progress represented by the CAD / CAM technology is determined by the digitization of the design and manufacture computer-dependent.

Conclusions. The advantages resulting from them, reside primarily in better control of the production cycle and the significant reduction of errors and inaccuracies operator-dependent, and secondly the ability to use sophisticated materials not otherwise processed by conventional techniques such as, for example, titanium grade 515.

Dentoskeletal effects of the Fast-Back molar distalizer followed by fixed appliances

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Aim. The purpose of this study was to analyze the skeletal and dentoalveolar changes induced by the Fast-Back appliance followed by fixed appliances when compared with untreated Class II controls.

Methods. The treated and untreated samples consisted of 27 subjects each (16 girls and 11 boys in the Fast-Back Group, FBG; 15 girls and 12 boys in the control Group, CG) with mean ages at the start of treatment of 13 years 3 months in the FBG and 13 years 2 months in the CG. Subjects of the FBG were treated during either the pubertal or postpubertal periods. Lateral cephalograms were analyzed at 2 observation periods: before distalization (T1) and after comprehensive orthodontic treatment appliance (T2). The T1-T2 changes in the FBG were contrasted with those in the CG by means of Mann-Whitney U test ($p < 0.05$).

Results. Treatment induced an average correction of molar relationship of 2.4 mm. The significant correction of the overjet (2.1 mm) was associated with a significant amount of lower incisor proclination (3.8 degrees). A significant extrusion of lower molars (1.8 mm) was recorded in the FBG. The FBG showed also a significant increase in total mandibular length (Co-Gn, 2.6 mm), a counterclockwise rotation of the palatal plane (1.4°), an increase in anterior facial height (N-Me, 2.7 mm), and in mandibular ramus height (Co-Go, 2.6 mm).

Conclusions. The Fast-Back is an effective appliance for Class II correction during the pubertal or postpubertal periods.

Denture Frame modifications in class III patients treated with face mask and rapid palatal expansion: a controlled retrospective study

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Aim. Skeletal and dental components of Class III malocclusion are present in early childhood, and tend to worsen with growth. Recently has been introduced the denture frame analysis to evaluate malocclusions and the importance of occlusal plane on control of malocclusion treatment. The aim of this retrospective controlled investigation was to analyze the short-term denture frame treatment outcomes of facial mask (FM) and rapid palatal expansion (RPE) therapy.

Methods. A group of 12 patients with Class III malocclusion treated with the FM and RPE (G1) was compared with untreated class III controls (G2). The mean age of treatment group was 8,3 years old (SD 2,4); treatment consisted of 4 weeks RPE activation (1/die) followed by 16 hours wear of the FM for a mean of 370 days (SD 91,7). As control group was used ones published by Sato et al, matched by age and malocclusion. Pre and posttreatment cephalometric values were compared and statistical analyzed with one-sample t-test. A 0.05 p-value was considered statistically significant. The error of the method for the cephalometric measurements was evaluated by repeating half of the total cephalograms randomly selected. Error was on average 0.6 for angular measures.

Results. T0-T1 changes were statistically different between G1 and G2 for POP ($p=0.01$), ABMP ($p=0.005$), ODI ($p=0.01$), PP-GoMe ($p=0.003$), SNA($p=0.004$) e ANB($p<0.001$).

Conclusions. Class III patients treated with FM and RPE show an improvement of both skeletal and dental relationship. The posterior occlusal plane shows a clockwise rotation with statistical significance in respect to non treated patients.

Diagnostic performance of dental maturity for identification of skeletal maturation phase

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Aim. Analysis of the diagnostic performance of the circumpubertal dental maturation phases for the identification of individual specific skeletal maturation phases.

Methods. A total of 354 healthy subjects, 208 females and 146 males (mean age, 11.1 ±2.4 years; range, 6.8-17.1 years), were enrolled in the study. Dental maturity was assessed through the calcification stages from panoramic radiographs of the mandibular canine, the first and second premolars, and the second molar. Determination of skeletal maturity was according to the cervical vertebra maturation (CVM) method on lateral cephalograms. Diagnostic performances were evaluated according to the dental maturation stages for each tooth for the identification of the CVM stages and growth phases (as pre-pubertal, pubertal and post-pubertal) using positive likelihood ratios (LHRs). A positive LHR threshold of ≥ 10 was considered for satisfactory reliability of any dental maturation stage for the identification of any of the CVM stages or growth phases.

Results. The positive LHRs were generally < 2.0 , with a few exceptions. These four teeth showed positive LHRs > 10 only for the identification of the pre-pubertal growth phase, with values from 10.8 for the second molar (stage E) to 39.3 for the first premolar (stage E).

Conclusions. Dental maturation assessment is only useful for diagnosis of the pre-pubertal growth phase, and thus precise information relation to the timing of the onset of the growth spurt is not provided by these indices.

Does it exist any additional effect of elastomeric ligatures throughout sliding mechanics?

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Aim. The aim of our study was to verify if there is an additional effect of the forces released by the elastomeric ligature through sliding mechanics, in both in-vitro dry and wet conditions.

Methods. A self ligating brackets (Empower, AO) of maxillary right canine, 1° and 2° premolars were tested with closed slides and with different combinations of placing of elastomeric ligatures(). These were lotted in 7 groups: as-received, 2, 14 and 28 days pre-stressed, 2, 14 and 28 days pre-stressed in artificial saliva. All wires used in this study were 17x 25 SS (). Each brackets-ligatures combinations was tested 10 times for each ligatures group, as well as test with closed slides. Frictional forces were measured on a specially designed Instron machine. The wires tested were pulled through a set of 3 leveled brackets at a speed of 4 mm per minute over a distance of 5 mm. The test machine was placed inside a 36°C thermostated plexiglass room (dry state). All data were statistically analyzed.

Results. The sliding of the wire in the 3-bracket aligned system was significantly influenced by the ligation method ($P < 0.001$) and different combinations of placing of ligatures ($P < 0.001$) through all test groups.

Conclusions. With straightwire mechanics, the friction has to be considered as the sum of the forces expressed by each ligatures along the length of the arch. This could place additional strain on anchorage demands and lead to reduce the desired movement.

Early treatment of class III malocclusion: comparison between different therapeutic models

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Aim. Class III malocclusion is a deviation in the sagittal relationships of the maxillary and jaw. The aim of this study is to analyze which treatment is the most effective and results stable at a post-treatment observation.

Methods. The survey consisted in a review of literature about the non-surgical treatment of class III malocclusion on "The Angle Orthodontics" and "European Journal of Orthodontics". The study covered the period from 1999 to 2009 and using the key-words "class III malocclusion and treatment of class III".

Results. It results that the best outcomes (76%) can be observed in rapid maxillary expansion-face mask therapy in class III patients with maxillary retrusion, and treatment results are stable at a follow-up observation 5 years after the end of orthopedic treatment.

Conclusions. An early orthopedic treatment of class III malocclusion is effective.

Early changes of circumaxillary sutures after rapid maxillary expansion in 13-year-old patient investigated with cone beam computed tomography

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Aim. The purpose of this study was to investigate the early effects of rapid maxillary expansion (RME) on the whole craniofacial complex.

Methods. A female 13-year-old patient underwent RME using Hyrax appliance. Cone beam computed tomography (CBCT) examination was done after active opening of the midpalatal suture showed in the clinical view by the appearance of maxillary interincisal diastema.

Results. In CBCT recorded images the complete opening of midpalatal suture was visible and also the medial dissection of the incisal foramen occurred. It could be reported opening or widening of nasomaxillary sutures and frontomaxillary sutures. Widening of sphenoid-occipital synchondrosis was noticeable.

Conclusions. CBCT investigation showed that early treatment with RME produced a significant bony displacement in the whole craniofacial complex in a female 13-year-old patient.

Edentulism and obstructive sleep apnea: a case report

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Aim. Obstructive sleep apnea (OSA) is a common disease that is estimated to affect 2% of middle-aged women and 4% of middle-aged men. Reported risk factors include obesity, increased neck circumference, male sex and anatomical abnormalities of the face. Although edentulism is reported to change the anatomy and also impair the function of the upper airway, it has not been typically recognized as a risk factor for sleep-related breathing disorders.

Methods. The subject of this report is a 55 years old man with a body mass index (BMI) of 33 kg/m². Cephalometric assessments of head radiographs taken in the lateral plane with and without dentures were performed; mandible plane-hyoid (MP-H) distance and the posterior airway space (PAS) were measured. Oxygen saturation (SaO₂) and apnea/hypopnea index (AHI) were evaluated.

Results. A comparison of the polysomnographies taken with and without wearing the dentures during the night showed that AHI was reduced (from 20.0/h to 5.7/h) and mean SaO₂ increased (from 94.0% to 96.0%). Cephalometric analysis showed that the removal of dentures led to a striking increase in the anteroposterior oropharyngeal wall distance from 5 mm to 10 mm, while the mandible plane-hyoid distance does not change.

Conclusions. These findings were consistent with the hypothesis that edentulism not always worsens OSA by an oropharyngeal collapse. Given the common occurrence of both conditions among the elderly, such as the reduction of obstructive sleep apneas with or without dentures, the observed relationship requires further investigations on the mechanisms through which the loss of teeth could help upper airway collapse during the night.

Effects of rapid vs slow maxillary expansion on nasal cavity volume in growing subjects

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Aim. The aim of the present RCT was to apply low-dose CT to compare the effects of rapid maxillary expansion (RME) and slow maxillary expansion (SME) on nasal cavities size.

Methods. 16 growing subjects were included in this study. Inclusion criteria were: constricted maxillary arch, first molars erupted, unilateral or bilateral posterior crossbite. Exclusion criteria were age above 15 years and systemic disease. The patients were divided into two groups (i.e. RME and SME) according to a balanced block randomize protocol. CT examinations were collected before positioning the appliance (T0) and at the end of retention (T1) 7 months apart. Two band palatal expander was used for all the subjects. Images processing was done into 3 steps: reslicing; dental and skeletal measurements; skeletal nasal volume computing. The region of interest (ROI) was set up from ANS to PNS. The upper limit of the ROI was set up at the level of the upper limit of the medium nasal turbinate.

Results. both palatal expansion protocols produced significant ($p < .05$) increases of skeletal nasal volumes. Total nasal volume increased on average was 1.27 mm³ and 1.25 mm³ for RME and SME respectively. The comparison between RME and SME revealed no significant differences between the two palatal expansion protocols.

Conclusions. both RME and SME are able to increase significantly the skeletal nasal cavity volume; the 2 expansion protocols present comparable efficiency increasing nasal skeletal volume.

Effects of the Frankel Regulator III appliance: a review

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Aim. The Frankel regulator III is an orthopaedic exercise device that aids in reprogramming the orofacial neuromusculature. This is supposed to counteract the forces which presumably restrict maxillary growth with a reciprocal limiting force in the mandible. The aim of this review was to study the effectiveness of the FR3 on the maxillary and mandibular bones and relative soft tissues.

Methods. PubMed, Medline, Lilacs, Cochrane Central, and Cochrane Database of Systematic Reviews were surveyed. Inclusion criteria were human subjects, prospective or retrospective studies, all studies which followed the objective of this review supported by statistical analyses and publications in English. Additional inclusion criteria were: frankel III used as the only therapy and a control group with no treatment.

Results. of the 234 studies identified in the search, only 8 met the final inclusion criteria.

Conclusions. The outcomes demonstrated a favorable functional and esthetic maxillary position, a significant ANB angle increase with improvement in overjet and in soft tissue profile too.

Evaluation of super-elastic open coil springs (Ni-Ti) in orthodontic applications

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The paper presents the main results of measurements to evaluate the mechanical characteristics of super elastic open coil springs used in Orthodontics.

Several Ni-Ti open coil springs were tested in order to verify the mechanical response, under planned deformations, measuring the generated forces.

A comparative analysis of force–displacements curves between different super elastics coil springs models was performed in the range of temperature from 21.5 °C up to 45.5 °C, to simulate their performances into oral cavity.

The results showed significant differences in comparison with the producers indications. This confirms the necessity to verify the open spring springs before their clinical use.

Evaluation of the mechanical characteristics of the screws for rapid maxillary expansion

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Aim. Expansion screws are subjected to an intense level of mechanical stress during rapid maxillary expansion (RME). The aim of this study was to evaluate the mechanical characteristics of the screws for RME.

Methods. Three commercially available RME expansion screws were tested: Leone A2620, Dentaurem (Hyrax 10), and Forestadent (Anatomic-Expander). The expansion screws were of 10 mm with stainless steel arms with a cross-sectional diameter of 1.48–1.49 mm. For the in vitro evaluation of the mechanical characteristics of the screws, the RME devices were adapted on same maxillary arch cast to simulate the clinical setting. An Instron 3365 testing machine with a load cell of 5 Newton recorded the forces released after 1, 5, 10, 15, and 20 screw activations. Each type of the expansion screws was tested 10 times. Statistical comparisons between the different types of screws were carried out by means of the Friedman test and the Kruskal-Wallis test with Tukey's post-hoc tests ($P < 0.05$).

Results. All 3 devices were able to develop force values to produce a separation of the palatine processes. The Dentaurem and Leone screws developed force values over 20 kg and the Forestadent screws about 16 kg.

Conclusions. The devices tested were able to develop forces of 16-20 kg. This force value is adequate for rapid expansion of the maxilla. The Dentaurem and Leone screws showed a greater level of rigidity when compared with the Forestadent screw.

Expression of Vascular Endothelial Growth Factor during orthodontic tooth movement

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Aim. Clarify the involvement of Vascular Endothelial Growth Factor (VEGF) in periodontal tissue remodeling during orthodontic tooth movement.

Methods. We utilized a coil spring NiTi 50 gr. in vivo samples of 15 maxillaries and mandibular premolars of patients aged from 13 to 18 years subject to orthodontic treatment. These teeth were extracted at 7 and 21 days from force application. We scraped the PDL from the radicular surface on the pressure and tension side. The results were compared with PDL samples of the homologous control teeth. The periodontal ligament samples were fixed in 3% paraformaldehyde in a 0,2M phosphate buffer at pH 7,4. We used primary antibodies mouse monoclonal anti-VEGF. Sections were then observed and photographed using Zeiss LSM 510 confocal microscope. We analyzed fluorescence intensity and compared with the control side.

Results. The pressure side was strongly positive for VEGF at 1 wk after the start of tooth movement, suggesting that VEGF may be involved in the early stages of periodontal remodeling during orthodontic tooth movement, when rapid changes in local blood circulation occur. Moderate VEGF expression was also evident on the tension side. In the last observation periods at 21 days, VEGF signal showing insignificant decrease when compared with the control group. This can correspond to the regenerative period in these same tissues which comprises deposition of new bone, with new regenerated fibrillar elements, which in turn replaces the previously increased vascular volume to control levels.

Conclusions. These findings suggest that VEGF plays a crucial role in periodontal remodeling during orthodontic tooth movement by acting directly on bone resorption and formation and on angiogenesis.

Gingival crevicular fluid alkaline phosphatase activity in relation to dental permutation

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Aim. The identification of correlations between the gingival crevicular fluid (GCF) alkaline phosphatase (ALP) activity and dental permutation recorded as the dentition phase.

Materials and

Methods. Eighty-five healthy growing subjects (51 females, 34 males; mean age, 11.7 ±2.3 years) were enrolled into this double-blind, prospective, cross-sectional-design study. Samples of GCF were collected from each subject at the mesial and distal sites of both of the central incisors, at the maxillary and mandibular arches. The dentition phases were recorded as intermediate mixed, late mixed, or permanent, and enzymatic activity was determined spectrophotometrically.

Results. The median GCF ALP activities were from 42.0 to 67.5 mU/sample across the dentition phases. Although these were slightly greater for the permanent dentition, no significant differences were seen. Also, no significant differences were seen between maxillary and mandibular sites in any of the comparisons.

Conclusions. The GCF ALP activity is not correlated with dental permutation

Herbst in titanium: manufacture of a new hygienic appliance achieved through CAD / CAM technology

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Aim. Describe the characteristics of a new hygienic Herbst appliance, designed by us through CAD/CAM and made in Titanium Grade 5.

Methods. Herbst, designed by us during CAD, has a dental support and presents splints opened for 2/3 of the occlusal side. These extended from the first molar to the first premolar for each hemiarch, with a thickness of about 0,5 mm, up to the interdental contact point without crossing it. The design of the appliance was realized on digital model. After CAD phase, design instruction are sent to CAM machine tools and milling begins from a block of Titanium Grade 5.

Results. The CAD/CAM equipment produced the Titanium Grade 5 Herbst appliance. Discrepancies between finished product and virtual design have been about 10-30 μm . Cementation was performed with glass ionomer cement. Finally, we mounted telescopic cursors.

Conclusions. The benefits of our titanium Herbst are: Absence of pain and discomfort for the patient during application of Herbst (interdental separation with elastic is not made); Oral hygiene maneuvers are easier to perform and a lower plaque accumulation is guaranteed; High precision during virtual design and CAD /CAM production stages; No allergic reactions due to the use of a biocompatible and corrosion resistant material.

ICT in orthodontics: cone beam tac applications in order to produce

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Aim. The use of new cone beam appliances can be utilized in order to prepare the digital models and not also to detect x-ray images for orthodontic diagnosis. The aim of this research is to evaluate the possibility to prepare also the invisibles appliances from the first x-ray acquisition, necessary for the orthodontic diagnosis.

Methods. 8 patients are selected in this protocol research. All patients, in the range of age between 18 and 34 years, don't have metallic restorations or crowns, in order to avoid problems in the images' detections. For every patient were made silicone impressions of the jaws (added with barium, necessary for the x-ray scan) and all impressions were scanned at the same time of the patients' scans. The results (DICOM Files) were compared in ScanSystems and in engineering department of Pisa University, with a new scan of the silicone impression and the scan of the stone's models derived from the silicone impressions.

Results and conclusions. the comparison of all dicom files showed that the cone beam images (Soredex, Scanora) could be used (as in surgical protocols in guided implant surgery) to integrate the informations made with the scan of silicone impressions in order to prepare the invisibles appliances for orthodontic therapy (All In).

Impacted lower canine and first bicuspid with horizontal positions: a case report of a boy affected by Down syndrome

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A patient with unilateral impacted canine and first bicuspid with a radiological diagnosis of very difficult practicability, was treated orthodontically with a fixed orthodontic device. A 13-year-old Italian boy was referred by her dentist because despite the age and still undergoing perm, his permanent molars have not erupted, as well as the canines and premolars and were still present in the arch teeth. The boy is suffering from Down syndrome, but he is very cooperative and does not have a good oral health as he had poor hygiene at home. He also is affected by agenesis of the upper and lower second bicuspids, and the lower left canine. The problem of the multi agenesis was the reason. The problem of ageneses was why it was decided to schedule the orthodontic disimpaction of impacted teeth. The crown of the canine was near the apex of the lateral incisor; the first bicuspid was positioned horizontally, with the root impacted on the corona of the canine, and with the crown now reducing the deciduous molar. The objectives of orthodontic treatment for this patient were to bring the impacted mandibular right canine and first premolar into the dental arch, level and align the arches, while maintaining the normal overjet and overbite, and achieve a bilateral Class I canine and molar occlusion. After about 8 months after surgery the bicuspid resulted visible in mouth. We discuss the problems associated with impacted teeth and the biomechanical interventions used for this patient.

Impacted lower canine: a case report

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A patient with unilateral impacted lower canine, with a radiological diagnosis of very difficult practicability, was treated orthodontically with a fixed orthodontic device. A 13-year-old Italian girl was referred by her dentist because of retained deciduous canine in the right mandible. A radiographic examination revealed that the mandibular right canine was in a horizontal position with its crown tip farther the apex of the incisive root. In was used a fishing-rod, a fixed device previously prepared by the technician, which tied up and drave into the canine's eruption. After about one year the canine resulted visible in the arch, so it was decided to hold the upper jaw while continuing to pull on the canine. The use of this device achieved the desired treatment goal. We discuss the problems associated with impacted teeth and the biomechanical interventions used for this patient.

Impacted lower second molar: a case report

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A patient with unilateral impacted lower second molar, with a radiological diagnosis of very difficult practicability, was treated orthodontically with a fixed orthodontic devices. A 9-year-old Italian girl was referred by her dentist because of the first permanent molar lower right not present in dental arch. The x-ray revealed that the third apical area of the roots formed an high angle respect to the long axis of the roots. Our goal was to treat this case with a nonextraction orthodontic approach, using upper and lower jaw appliances, while doing our best to correct the impacted tooth, and maintain the profile and reach as good a final occlusion as possible. The treatment time for the drive phase was about 6 months. Retention was established with a removable plate. The orthodontic treatment achieved the desired treatment goal. We discuss the problems associated with impacted teeth and the biomechanical interventions used for this patient.

Indications for occlusal disclusion devices in phase 1 of a passive self-ligating multi-torque technique

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Aim. the use of the occlusal disclusion devices in a self-ligating continuous arch technique is related to changes in biomechanical reactions of the tooth-bracket-arch system. These reactions requires specific modifications in phase 1 setup. Aim of this paper is to give information about the correct use, when necessary, of the occlusal disclusion devices in phase 1 of a continuous arch self-ligating technique.

Methods. Literature review about this topic.

Results. authors describe two ways to correctly use the occlusal disclusion devices, in order only to functionally disclude the teeth or also to modify the mandibular position (when disturbed by a co/cr sliding). Functional teeth disclusion: reducing occlusal contact, during a continuous arch self-ligating orthodontic treatment, may improve the arch form recovery and development. This effect is well obtained by the use of adequate stops on the Copper-Niti arch. Generally the occlusal disclusion device is a bite-plane, symmetric on the L. and R. side (the same teeth number on the left and the right) in the anterior (incisors) or lateral (buccal cusps of molars) area of the arch. To check the device is sufficient the clinical approach, looking to the device's effect in centric relation: is necessary to see that the mandibular position is not (but vertically) changed. This technique, when associated to early light elastics, must be evaluated for: 1) desired extrusion amount 2) kind and number of involved teeth 3) 3D vectorial analysis of elastics effect (vertical, sagittal and transversal). Disclusion and mandibular repositioning: these devices may be useful when the mandible, closing to the first teeth contact, slides (in the anterior and/or lateral direction) to a maximum intercuspation occlusion. In these situations the occlusal disclusion device, associated with early light elastics, allows to recover a normal cranio-mandibular relation. The amount of vertical disclusion, the number and position of the supporting teeth and the kind of occlusal surface are to be decided upon the single patient's needs.

Conclusions. authors suggest the occlusal disclusion devices as a useful help in the phase 1 of a passive self-ligating technique.

Indications for torque selection in a passive self-ligating multi-torque technique

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Aim. during a pre-activated orthodontic technique therapy is very important, in order to well select the correct biomechanic, a skill analysis of all the aspects involved in the dental movement especially the starting and final position of the teeth and the anchorage requirements for antero-posterior and space closure movements. Aim of this paper is to give information for torque selection in a passive self-ligating multi-torque technique. This technique allows the use of three different torque level (standard, low and high level) for upper central and upper lateral incisors and lower cuspids. For lower incisors the technique allows the use of two (standard and low) different torque level.

Methods. Authors analyze the proposed brackets pre-activation of the self-ligating multi-torque technique. Looking to the biomechanical requirements of this continuous arch technique, authors give useful indications about torque selection related to the patient's occlusal starting situation. Authors give also biomechanical indications for the more frequent malocclusions therapy.

Results. the use of different torque level in the anterior area of the arch, allows the orthodontist to avoid undesired side-movements in these areas, due to the specific biomechanical needs in different malocclusions.

Conclusions. the torque selection in a passive self-ligating multi-torque technique is a very useful biomechanical possibility. It may avoid undesirable side movements and loose of anterior anchorage in continuous arch techniques.

Instrumental Evaluation of II class Angle Malocclusion.

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Aim. In the present study, the possible etiological role of masticatory muscles in the development of a second class Angle malocclusion has been investigated both in ipodivergent and iperdivergent patients.

Methods. Ten patients with a second class Angle malocclusion were examined and Surface Electromiography, T-Scan and Kinesiographic test were performed.

Results. Ipodivergent patients showed an increased activation in all the muscles studied, especially the Anterior Temporalis and Masseter, which presented an occlusal barycentre more anteriorly positioned and a higher speed in the process of opening and closing when compared to the iperdivergent subjects.

Conclusions. Structural and/or positional mandibular changes can be related to a dysfunction in the muscular activity. The muscular factor can alter the growth pattern especially in the ipodivergent patient.

Interference caused by fixed orthodontic appliances during the performance of nmr diagnostic tests

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Environment can be dangerous for patients with biomedical devices, due to the movement of global suffering and objects made of ferromagnetic materials after exposure to the magnetic field. Another issue concerning the implementation of diagnostic magnetic resonance imaging in patients with biomedical equipment is represented by artifacts. This thesis aims to evaluate the behavior of fixed orthodontic devices of restraint (orthodontic retainers) placed inside a magnetic resonance apparatus to perform a survey of MRI lumbosacral level. The evaluation took place through: an analysis of plaster casts (to detect any movement of teeth or device), the execution of the electrical test of pulpal vitality (to analyze the vitality of the teeth before and after the execution of MRI) and the recording of reports (to determine the possible presence of artifacts).

Laser biostimulation and self ligating appliances in orthodontics: periodontal remodeling

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Aim. The use of laser biostimulation in combination with self ligating appliances in order to stimulate the growth of attached gingiva was examined in 23 teeth erupted in vestibular mucosae, in maxillary and mandibular jaws of 15 patients in a range of age between 11 and 27 years. Self ligating appliances have a low periodontal impact and allow us to achieve a good alignment. Laser biostimulation with diode lasers improves the cellular activities and the periodontal regeneration.

Methods. 15 patients are selected in this protocol research. All patients had canines or premolars in vestibular mucosae, without keratinized gingiva. No active periodontal disease (no BOP and gingival recessions). 18 canines (16 in the upper jaw and 2 in mandible) and 5 premolars (4 in mandible and 1 in maxilla) were involved. No BOP and CAL loss at the start of the orthodontic treatment. Every patient was treated with self ligating appliances (Time2/Time3, American Orthodontics). In every orthodontic session (each 34 days as average) the patient was treated with diode laser biostimulation (Wiser /Lambda, G8 Galbiati), for 5 minutes with 600 micron fiber section, on utilizing the Biostimulating machine parameters (2/4 watt, focalized or defocalized, on depending the laser machine utilized). No thermal effects were produced by lasers applications.

Results. At the moment of debonding, 23 teeth involved in the research were evaluated in terms of quality and quantity of attached gingiva. BOP and CAL loss were also investigated. 3 patient showed an inflammatory reaction around the crown of the teeth examined, with BOP +, without loss of CAL. Every tooth considered, at the end of orthodontic treatment showed a attached gingiva were before (at the start of treatment) were oral mucosae.

Conclusions. The combination between self ligating appliances and laser biostimulation could improve the differentiation of periodontal ligament's stem cells in fibroblastes, able to promote attached gingiva around the crown of the teeth erupted in oral vestibular mucosae.

Lingual orthodontic's evolution: CAD / CAM incognito systematic

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The CAD/CAM technology has been used in lingual technique to create highly individualized brackets for the single patient in order to overcome difficulties such as the anatomic variability of the lingual side and at the same time to guarantee a better accuracy in the bracket positioning. The CAD / CAM used in lingual technique is well represented in the systematic "Incognito", which, through high-tech procedures, makes individualized brackets for each tooth and special preformed wires with the aid of robotic technology. The wires, in fact, are bent to the needs of each individual patient and to goals treatment. They also can be regarded as guides to move the teeth into the right position. Through this new system of construction of the brackets can be easily overcome the problems normally attributed to the lingual technique: patient's discomfort during the first period, bracket's detachment and difficulties in the rebonding step, problems in the finishing phase. Compared to the previous routine, the main difference proposed by the CAD / CAM technology is represented by the concept of individualization in the construction of lingual brackets: indeed, it represents an important step forward for the lingual technique therefore able to overcome problems that until now could be the cause failure in clinical practice of the orthodontist.

Literature review of in vitro studies of frictional resistance in low-friction orthodontic systems

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Aim. The aim of this review was to compare in an in vitro setting the amount of produced frictional resistance that orthodontic Self Ligating brackets (SLB) and low-friction systems produce compared with conventional brackets

Methods. a review of the literature published between January 2000 and December 2010 was performed. Studies were identified by conducting PubMed and Medline electronic searches and through reviews. A total of 34 papers from the electronic database were selected. Selected papers were classified according to their methodological quality and summarized in terms of evidence-based conclusions.

Results. Laboratory studies show that binding of the wire against the corners of the bracket, which occurs soon after tooth movement begins, is much more important than previously thought, and that notching of the archwire, which temporarily stops movement, can occur. Without a tipping moment, resistance to sliding increased with the active self-ligating brackets with increasing archwire size. This review moreover analyzes the evolution of in vitro studies in the last 10 years.

Conclusions. Resistance to sliding between brackets and archwires is highly dependent on the experimental setup. In the last 10 years the in vitro tests have improved: the most recent test are easier to perform, faster and more efficient.

Mandibular growth changes in untreated subjects with class II malocclusion by mandibular retrusion

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Aim. Subjects with various dento-skeletal disharmonies grow differently in both the amount and the direction of growth of the craniofacial structures. Untreated Class II, division 1 malocclusions by mandibular retrusion show significant deficit of mandibular growth. The purpose of this study was to evaluate the amount of mandibular growth in untreated Class II, division 1 subjects, in relation to the different types of mandibular retrusion.

Methods. Study population included 57 untreated dento-skeletal Class II subjects (27 boys, 30 girls) with mandibular retrusion: ANB angle more than 4° and SNB angle less than 78°, respectively. Children with maxillary protrusion (SNA greater than 84°) were excluded. Standardized high quality lateral cephalometric radiographs were analyzed at T1, mean 8.9 years and T2, mean 10.5 years. A customized software (View-box software, version 3.0, Halazonetis, Kifissia, Greece) was used for all cephalograms. The sample was divided in four groups based on type of mandibular retrusion: the Dimensional group (D) with a short mandibular body length, the Rotational group (R) with a clockwise mandibular rotation, the Positional group (P) with a posterior position of the mandible and the mixed group (M) with various combinations of the three characteristics. The statistical comparisons of growth changes in the 3 groups were performed with ANOVA tests.

Results. Findings showed a mean growth of the mandibular body length of 2.73 mm (SD ±2,23) in a mean time of 1.7 years. The different groups of mandibular retrusion showed only a few statistical differences. The mandibular body length had a greater increase, but not statistically significant, in the Dimensional group compared to the other groups.

Conclusions. These findings may shed light on growth expectations in untreated subjects with different types of mandibular retrusion.

Manufacture and clinical evaluation of a BITE in PMMA

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Aim. Manufacturing of an occlusal splint designed by CAD/CAM technology and assessment of clinical benefits.

Methods. Stone casts made from oral impressions were scanned with CAD/CAM technology. The CAD/CAM device used was a structured light-based scanner. CAD generates a 3D digital image on which it was possible to design the splint. During CAM, the BITE was made out of Poly-Methyl-Methacrylate (PMMA), which has a thickness of about 20 mm. This material, industrially cured with high-pressure autoclaves, prevents the formation of residual monomers and reduces the absorption of water. An excellent surface smoothing is obtained through the passage of a silicon rubber, a cotton brush and a pumice stone.

Results. The production of a BITE through digital design. The standardization of the BITE manufacturing technique is due to computer-aided procedures. The material offers many clinical advantages: the absence of residual monomers, which may cause allergic reactions, allows its use on prone subjects too. It's not easily subjected to pigmentations, which can generate an unsatisfactory aesthetic result in the course of time. It's very smooth and this ensures less plaque accumulation.

Conclusions. The BITE was manufactured thanks to CAD/CAM technology which allowed us to achieve excellent biological and aesthetic outcomes with an easy and rapid technique.

Maxillary Sinus Dislocation "by means of orthodontics": Clinics and Rationale

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There are few studies in literature that show a "rationale" for orthodontic dental movement across maxillary sinus, in order to close edentulous space (for agenesis or extractions). In literature, many studies underline that sinus cortical floor is an obstacle to orthodontic movement so that is easier dental tipping: sinus cortical outline is an important variable because its thickness is related to many factors like as skeletal biotype. The aim of this report is to point out if regenerative orthodontics (maxillary sinus dislocation by means of orthodontics) is better than pre-orthodontics regenerative (sinus membrane surgical elevation). In order to eliminate the variable of the sinus floor, the samples are selected at these conditions: 1) extraction of upper molars because irreversibly compromised by periapical lesions up to endo-antral syndrome: in these cases a post-extraction maxillary sinus pneumatization is larger in an inferior direction 2) orthodontic closure movement begins immediately after extraction. In conclusion: the intrinsecal regenerative potential of a close cavity (maxillary sinus like as a cyst) is improved by piezoelectric orthodontic remodelling. And furthermore the bone density, improved by allogenic material, can slow down orthodontic movement. So it may be better avoiding sinus surgical elevation before orthodontic dental movement across the maxillary sinus post-extraction pneumatization. If sinus cortex is thick, it may be better discontinue the cortical floor, for example, by "Fugazzotto technique". The cases are studied using pre and post orthodontic treatment panoramic radiographs. The space closure is obtained by mesialization of distal molar with wisdom tooth disinclusion (group 1), or with wisdom tooth without antagonist carried in a functional site (group 2), or with wisdom tooth not yet erupted (group 3), or by distalization of premolar (group 2) in order to:

- 1) correct anterior dental crowding
- 2) correct anterior incisal protrusion
- 3) obtain the skeletal II class camouflage
- 4) insert an implant in front of the distalized bicuspid

Mechanical performance of aesthetic low-friction systems

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Aim. In this in-vitro study, the authors compared the mechanical performance of 2 types of aesthetic ceramic brackets: In-Ovation C® (Dentsply-GAC) a self-ligating brackets (SLB) and Logic Line™ aesthetic brackets in association with low-friction ligature systems (Logic Line™ + Slide™; Leone Orthodontic Products) and the Logic Line™ aesthetic brackets combined with conventional elastomeric ligatures (CEL) during the leveling phases.

Methods. Inspired at previous works, an experimental model consisting of five brackets was used to assess the mechanical performances of aesthetic low-friction systems and CEL. The forces generated by a 0.014-in superelastic nickel titanium wire, with the 2 types of aesthetic low-friction systems (In-Ovation C®; and Logic Line™ aesthetic brackets with Slide™) and the Logic Line™ aesthetic brackets with CEL at various amounts of canine misalignment (1.5, 3, 4.5, and 6 mm) were recorded. During loading and unloading, the activation and deactivation forces and energy were recorded and were tested 20 times.

Results and conclusions. A significantly greater amount of force was released with low-friction systems when compared with CEL systems for all the tested variables ($P < .05$), with the exception of the 1.5-mm canine misalignment. The aesthetic low-friction systems showed no significant comparative differences.

Mini-screws and mini-implants in orthodontic treatment: an analysis of clinical trials

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Aim. The aim of this study was to review the literature to evaluate failure rates and factors affecting the stability and success of mini-implants and mini-screws used as orthodontic anchorage.

Methods. The data were collected from an electronic database (Pubmed) with 4 search terms combinations: [screw orthodontic failure], [screw orthodontic success], [implant orthodontic failure] and [implant orthodontic success]. Randomized clinical trials, prospective and retrospective clinical studies with at least 80 mini screws/implants were considered.

Results. The search up to January 2011 provided 239 abstracts. By screening these abstracts, 120 articles were identified. After the exclusion criteria were applied, 18 articles were identified. The analyzed results were divided into 2 topics: 1) which factors affected mini-implants and mini-screw success and 2) which factors are more important and in how many articles they are cited. General host factors (age, sex) have no statistical significance, geometric factors (diameter, length) and some local host factors (upper or lower jaw, soft tissues characteristics) influence clinical success.

Conclusions. All articles report success rates higher than 80%, but there are different standards, mostly regarding the survival time of the mini screws/implants, to define clinical success. Anyway in all the studies the use of mini screws/implants allowed to achieve treatment goals.

Myobrace in interceptive orthodontics

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Aim. Evaluate the effectiveness of the Myobrace equipment to intercept dental malocclusions. The ideal age range for treatment with Trainer System is between the 8 years old and 12 years old. By using Myobrace you get a balance between the facial muscles, jaw muscles and better interarch value with a consequent improvement in the alignment of teeth.

Methods. Myobrace is required to use it for 4 hours a day, preferably in the afternoon and for the duration of the night. It is important that the patient is encouraged to keep their lips approached so the protrusive jaw muscles are held in place by stretching. If this position is held correctly for the expected time, even during the hours when the patient does not wear the device it will be hypercontraction of the muscles, leading to a hypervascular area.

Results. Myobrace is able to align the front teeth, correct the class II skeletal and dental elements provide a second ideal arch form. The optimal time of application is the eruptive phase of growth in the late mixed dentition. It is possible to observe a myofunctional effect and alignment of teeth in the first 2-3 months of treatment.

Conclusions. Myobrace has been found effective in the resolution of deep-bite in growing patients and as a viable alternative to the treatment of malocclusion at early age, as does advancing the mandible and dental crowding by improving the alignment.

Myofunctional and speech rehabilitation post orthodontic-surgical treatment of dento-maxillofacial dysgnathia

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Aim. The treatment of dento-maxillofacial dysgnathia involves the re-harmonization of all stomatognathic components obviously considered from both a structural and functional point of view. The combination of dental malocclusion and skeletal malformation requires the use of combined orthodontic and surgical treatment. During the therapy particular attention should be given to the tongue, since orthognathic surgery leads to volumetric changes of the functional space in which it is situated and carries out its functions. It is known that the lingual dysfunctions can play a decisive role in the pathogenesis of dento-skeletal dysmorphisms. This suggests that the lingual rest posture, deglutition and articulation of language should be re-educated and adapted to the structural changes obtained with the orthodontic-surgical treatment. The aim of this work is to show the main post-surgical rehabilitation strategies adopted at the Pre-surgical Orthodontic Service of the Department of Dental Sciences at the "Sapienza" University of Rome. Through the study of a sample of patients will be demonstrated the importance of myofunctional therapy and speech therapy in order to achieve long-term success in the treatment of dento-maxillofacial dysgnathia.

Methods. After orthognathic surgery the muscles must regain a physiological condition of tone and synergy, and the patient must gradually become aware of the proprioceptive changes in both dento-periodontal and musculo-skeletal. To accelerate these processes we teach all patients to perform facial expression exercises and simple jaw exercises. The post-surgical orthodontic phase usually lasts 4-6 months, at the end of which this fixed orthodontic apparatus is removed and a removable restraining device is applied. At the end of the treatment, it is our practice to carry out a comprehensive reassessment of the case: the radiographic and photographic documentation from the start to the end of the treatment is compared and the therapeutic phases analyzed, an opinion is provided on the aesthetic and structural result of the treatment (poor, fair, good, excellent). While aware that the goal of this treatment is the global morpho-functional re-harmonization of the stomatognathic apparatus, it appeared necessary to more thoroughly assess the neuromuscular component. We therefore realized, in collaboration with the Phoniatrics Operations Unit of the Department of Sense Organs at the "Sapienza" University of Rome, a post-surgical orofacial evaluation and rehabilitation program. The protocol was developed through a study of 30 sample adult patients originally suffering from dento-maxillo-facial dysgnathia. Only patients with "good" and "excellent" treatment results were selected, which confirmed that the structural pathology was resolved. Based on the original dysgnathia, we have identified 3 groups made up respectively of 8 Class II, 11 Class III and 11 open-bite associated or not associated with an alteration of the sagittal plane (2 in Class I, 2 in Class II and 7 in Class III). In total therefore, there are 10 Class II, 18 Class III and 2 Class I. At the end of the post-surgical orthodontic phase carried out as routine the patients underwent a functional assessment of the orofacial district in order to identify any dysfunctions and assess the extent. A brief anamnesis is followed by an analysis of the orofacial muscles focused on the anatomical and functional characteristics of the lips and tongue in static and in dynamic phase. Data collection is completed by an assessment of the phonetics carried out by a speech therapist. To standardize the assessments, the data was collected in a specially designed folder. The indications provided by the examination made it possible to obtain, where necessary, an individual re-education program composed by an active myofunctional-logopedic approach integrated with appliances used as retention. The re-education of tongue posture and deglutition is composed of a preliminary phase aimed at "restoring proprioception," which follows a phase of myofunctional re-education, more properly characterized by "muscle exercises" and "functional recovery". Language re-education begins after myofunctional treatment and it includes various successive stages: brief orofacial exercises, vocalization exercises and lastly, speech therapy exercises. The stimulation of the phoneme therefore proceeds in ascending order, first by proposing direct and inverse pronunciation of syllables, and then proceeds with words containing the syllable in combination with other phonemes. The next step is to work on the word with the phoneme in initial, middle and end position. When there are various defective phonemes to be re-educated, the preference is to begin with those that are easier to simulate (/t/d/l/n/), until reaching those most difficult to correct (/s/r/). Restraining devices were routinely applied to the 30 sample patients. The Retainers, by encouraging the dynamic stabilization of the occlusion and neuromuscular function, represent an active means of restraint that can integrate the re-education phase. Since generally associated with a lower lingual impairment, in Class II dysgnathia splinted Retainer is applied (used in 8 sample patients). In progeny syndromes a Class III Retainer is applied (used in 16 sample patients). This kind of Retainer is fitted with a retro-incisive lingual grid to prevent tongue movement in the front portion of the lower arch and redirecting it to the top plate. In order to obtain a re-educational effect only on the tongue, the use of Bonnet ELN (Envelop Lingual Nocturn) is indicated. In our sample, we applied this device to 6 patients (2 with simple open-bite, 2 with Class II open-bite and 2 with Class III long-face open-bite). The ELN is made of a thin intraoral resin shell which stimulates the active ascent of the tongue through a lower lingual ramp up to a hole in the opening near the palatine folds.

Results. The evaluation of the 30 sample cases shows that after the structural anomalies were resolved, disrupted functions continued in almost all patients. In patients treated to resolve the prognathism, there appears to be evident postural changes in the tongue which generally continues to be hypotonic and low; the open-bite group shows a more evident tendency to interpose the tongue between the arches while in Class II lingual capabilities are less involved. 19 patients needed myofunctional therapy to restore proper deglutition and tongue posture; most patients belonged to the open-bite group (9 of 11) and the Class III group (7 out of 11). Articulatory disorders were found in 7 patients originally suffering from Class III and/or open-bite; 5 of these have completed rehabilitation with speech therapy.

Conclusions. In light of our experience we can conclude that in dysgnathic individuals the functional habitus does not change substantially even after surgical intervention. In order to ensure the stability of the treatment results, a new structural and functional equilibrium must be achieved, better than the previous, otherwise there is a tendency towards relapse. Post-surgical re-education requires an interdisciplinary approach that makes it possible to intercept and re-educate all the functions that are not compliant with the new structural picture. After surgery, the surgeon entrusts the task of guiding the functional recovery of the patient to an orthognatodontic specialist. The first "post-surgical re-education phase" coexists in fact with post-surgical orthodontics and sees us routinely involved in re-educating jaw movements and mimic muscles. Once the fixed orthodontic devices are removed, our assessment is no longer sufficient and supervision is required by a professional specialized in assessing the functions of the orofacial district. In particular, the lingual capabilities should be evaluated by a voice specialist or speech pathologist who, if necessary, will implement a second "speech therapy-myofunctional re-education phase" bent on harmonizing the centrifugal force of the tongue with the opposing forces of the peripheral muscle housing. In our opinion this second phase of rehabilitation is not recommended before the orthognathic surgery but indicated at the end of the global orthodontic-surgical treatment. As stated by the principle of "etiopathogenetic diagnosis" by Langlade, if the etiopathogenetic process is not discovered and removed, the result will be recurrence. In the treatment of dysgnathia this principle should be applied to all possible changes within the concept of multifactorial etiology. In fact, if under normal conditions dyslalia in itself is not capable of determining apparent structural alterations, in a patient undergoing post-surgical reconsolidation of his functional balance, even an uncontrolled speech defect may lead to an unstable result. Only through an interdisciplinary approach it's possible to restore a physiological morpho-functional equilibrium of the stomatognathic apparatus eliminating a tendency to relapse dysgnathia.

NITE-Guide

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Aims. This work wants to describe the use of Nite-Guide device in preventic Orthodontia at (reparto di ortognatodonzia della clinica universitaria).

Methods. The Nite-Guide is a guide for an ideal form of the arch expanding the circumference and the breadth of the arch between the deciduous incisors. It's also able to prevent the development of an excessive overbite, a massive crowding of 7 mm in permanent dentition, rotations dental malposition and is able to intercept finger sucking habit, swallow with protrusion of tongue and oral abitudinal respiration. It prevents the temporo mandibular jaw problems in older age and reduces until six time the incidence at 14 years old. It improves the mandibular protrusion on sagittal and vertical plane. The device delivered during the euption of central permanent incisors and the therapy continued until the eruption of lateral permanent incisors. Than it will be replace with the Occlus-o-Guide type G. It is An orthodontics preventic device suggest to 5-7 years old childs. It was valuated the efficacy of orthopedics and orthodontics device in second skeletal class deepbite in pediatric age.

Results. The Nite-Guide results an efficacious device in malocclusions prevention in dynamic phase of the growth, especially in second dental and skeletal class with dental and skeletal deepbite.

Conclusions. the Nite-Guide is able to prevent future problems,intercepts same bad habits and prevents temporo mandibular jaw problems

Occlus-o-Guide: Myofunctional effects

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Aim. Evaluate the myofunctional effect of the device occlus-o-guide in patients treated in the Department of Orthodontics of the Dental Clinic of Milan, in the first phase of the pubertal growth spurt.

Methods. Occlus-o-Guide has been used in mixed dentition. Upon delivery of the elastodontic equipment, patients were instructed on how to use, in particular, has been asked to carry the device at night and for four hours during the day.

Results. The restoration of the correct spatial relationships between the upper and lower incisors was achieved early and already the control after 3 months in many cases there has been a significant reduction in overjet.

Conclusions. The preliminary clinical results showed the effectiveness of the devices elastodontics in early orthodontic treatment in the resolution of the bad habits and the consequent restoration of proper relations dento-alveolar. Guiding the eruption of canines and premolars to a perfect occlusal relationship and aligning the front teeth is indicated for the resolution of various degrees of overbite, overjet up to 10 mm, dental cross-bite, mild rotations, important curves of Spee and crowding media entities. Also being built at a ratio of head to head facilitates mandibular advancement allowing the resolution of class II skeletal. However therapeutic success is conditional on the correct information which must support the prescription of the equipment and the attainment of a satisfactory patient compliance.

Orthodontic and orthognatic surgical treatment in III class malocclusion, with stabilometry evaluation

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A 20,5 years old white female patient in Polytechnic University of Marche was treated. Patient was in good general health with no history of trauma or serious illness, III Class malocclusion and with excellent hygiene and periodontal health. The patient reported noticing jaw asymmetry. After orthodontic and surgical treatment the occlusion finished in a Class I canine, Class I molar relationship on both sides. Overbite and overjet relationships were ideal. The aim of the present paper is to evaluate the effect of III class's treatment on facial aesthetic and the postural variation obtained after fixed appliances and surgery treatment. A postural test was performed on each patient using a computerized Postural test (Lizard).

Orthodontic emergencies: Epidemiological reliefs on a population consulting the Dental First Aid Department at Spedali Civili in Brescia between 2007 and 2010

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Aim. We undertook an epidemiologic study to evaluate: the incidence of orthodontic emergencies within the accesses to the Dental First Aid Department (Spedali Civili, Brescia, Italy); their distribution according to age, gender, nationality; kinds of emergencies and treatment.

Methods. Our sample included 483 accesses registered in our virtual database between 2007-2010.

Results. Within 54833 accesses the incidence of emergencies was 0,88% (483 accesses). The mean age was 15.2 y (range 6-47), 47.6% (230) M, 52.4% F (253). 93,5% were Italians (452). We observed: orthodontic devices detachment (44.09%), breaking (25,67%), oral lesions (18,8%), wire displacement (4,55%), bracket (4,55%) or ligature detachment (2.27%). The treatments included: replacement (45,47%), removal (33,95%), medication and removal (12,83%) and no treatment (10,35%).

Conclusions. Despite the low incidence of orthodontic emergencies, they often needed a complex treatment. It's greatly important that the clinician non orthodontically formed recognizes the cases in which the best treatment is to refer the patient. Gender distribution wasn't significant. The mean age confirmed that most of the orthodontic patients were Italian children or adolescents.

Orthodontic management of impacted maxillary central incisor with dilacerated crown. Three dimensional evaluation

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Dilaceration of the permanent teeth usually occurs because of trauma to the deciduous dentition. Dilaceration in the crown is rare compared with that in the root and is more common in the maxillary and mandibular incisors. Commonly, the surgical exposure of the tooth followed by orthodontic traction or extraction of the tooth is the recommended choice of treatment. In this report an innovated orthodontic approach using 3D rendering techniques is presented for the surgical and orthodontic management of a right impacted permanent maxillary central incisor with dilaceration of the crown. A literature review concerning the surgical and orthodontic treatment approach of dilacerated impacted teeth is also provided. The use of novel 3D rendering techniques allows a correct diagnosis and treatment planning. Three dimensional computed tomography may enable clinicians to make a quick and accurate diagnosis of dilacerated impacted teeth. 3D rendered CT images are useful for determining the shape of the root, the crown, and the correct position of an impacted dilacerated tooth in the maxilla.

Orthodontic superimposition of three dimensional volumes in class II treatments

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The aim of the study is to establish an easy method to obtain three-dimensional superimposition. Patients in Class II molar relationship were selected and subjected to the tomographic exam before and immediately after the distalization of the first upper molars with two different appliances: the Hilgers' Pendulum and the MGBM System. The realization process was divided in three steps. The first is the image orientation of the axial, coronal and sagittal slices, placing them on the reference plane of the projection, in order to orient each volume at the same position. The second step is the volume segmentation, to reconstruct the three dimensional images of every anatomical structure. The last process is the localization of the same landmarks on the two volumes. The landmarks chosen for the general area of superimposition are: Apophises Crista Galli, Pt point (right and left) and the anterior apophises clinoidee (right and left). PTM point (right and left) and the Incisive Foramen were instead chosen for the maxillary area and the two mandibular foramen and the two mental foramen for the mandibular area. The result obtained may be considered acceptable since the variation between the two volumes corresponds to the dental and skeletal changes induced by treatment with the appliances used. Further confirmation comes from the comparison with the two-dimensional superimposition.

Orthognatic implications of oral breathing

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Aim. analysis of mechanisms and causal factors that cause oral breathing, and the identification of an interdisciplinary diagnostic and therapeutic approach.

Methods. The correct identification of an oral breather requires an accurate history, clinical examination and specific laboratory examinations (test of Rosenthal, Gaudin, Robin Soleil, Cottle, Glatzel mirror) even by orthodontist who, in his clinical practice, is frequently ahead of this disease.

Results. For the close relationship between respiratory function and craniofacial development often we find association between oral breathing and dysgnathia: hence the importance of careful assessment of predisposing factors to catch any maxillo-facial malformations.

Conclusions. The collaboration of several specialists (pediatrician, orthodontist, otolaryngologist) is essential to achieve early diagnosis and subsequent treatment with an interdisciplinary approach aimed at restoring the physiological respiratory function and correct occlusal relationship.

Osteogenetic Distraction: Orthodontic Guidelines

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Aim. In surgery, Osteogenetic Distraction (O.D.) has been increasingly recognized as a possible alternative to the classical surgical treatment. To provide an alternative treatment to surgical orthodontics for skeleton Clas III malocclusion due to maxillary retrusion.

Methods. A maxillary distractor for the front segment (Triaca A.) was used to obtain the total premaxilla advancement, after an appropriate orthodontic preparation using a fixed segmented appliance, aimed to create a minimum of 5 mm gap at the apex level between the canine and the premolar teeth, in order to perform an osteotomy without prejudice for the teeth roots. An external stiff distractor (Red II System) was used for O.D. in cases of severe cleft lip and palate with much retruded small upper maxilla.

Results. Throught the description of some patient cases, a few guidelines for the uses of O.D. in skeleton Class III malocclusion, due to maxillary retrusion are suggested.

Conclusions. O. D. provides a slower, and thus more "physiological" solution for skeleton malocclusion than the usual traditional techniques. It is necessary, however, to follow up surgery with an appropriate orthodontic finalization.

Palatal orthodontic miniscrews: diagnostic and topographic evaluation in adult and pediatric patients

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Aim. To analyze the palatal area, in its quantitative and qualitative components, to evaluate which are the most appropriate areas for miniscrews insertion, with a particular interest to the pediatric patient. Original mapping for orientation of the clinician are created, representing the different volumetric and densitometric characteristics of palatal regions.

Methods. Systematic review of the scientific literature of the last decade on the topic.

Results. Except for the region at the incisive foramen, the entire palatal area has proved to be an ideal site for insertion of orthodontic miniscrews: indeed, despite the greater thickness recorded in the anterior region, the positioning in the posterior area is still able to ensure primary stability of the implant, thanks to the presence of adequate bone density and thickness, as well as the presence of a double cortical layer, and of reduced thickness of adhering mucosa. Original schemes are created for every area.

Conclusions. Palatal miniscrews can be an excellent and viable alternative to the traditional methods of anchorage, in adult and in pediatric non compliance patients; the palatal paramedian region in these patients consists of dense and thick bone, enough to support one or more mini-implants, even in the posterior portion, in combination with other methods of anchorage.

Periodontal health and microbial biofilm mass evaluation in adult subjects treated with the Invisalign System and with fixed orthodontic appliances

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The use of removable orthodontic appliances can avoid negative effects on periodontal health allowing patients to carry out oral hygiene without obstacles. The aim of this preliminary study was to evaluate microbiological and clinical changes occurring during the first three months of orthodontic therapy in adult patients with fixed appliances and with the Invisalign® System. Plaque Index (PI), Probing Depth (PD), Bleeding on probing (BOP), Compliance to oral hygiene and subgingival microbial samples were assessed on 30 patients: 10 was randomly assigned to treatment with the Invisalign® system, 10 to treatment with fixed orthodontic appliances and 10 subjects to the control group which had no orthodontic treatment. The microbial samples were analyzed with real time PCR to detect periodontal pathogens and microbial biofilm mass. A statistical comparison was made over time and among the experimental groups and the control group. Only one positive sample for periodontopathic anaerobes was found in a patient treated with fixed orthodontic appliances. A direct influence of orthodontic treatment on compliance was found in Invisalign patients who showed an increase of the time dedicated to oral hygiene and less subgingival biofilm mass. A decrease of PD ($p < 0,002$) and BOP ($p < 0,001$) was detected in the Invisalign group, these patients showed lower levels of subgingival microbial biofilm mass particularly the subjects with weak compliance to oral hygiene.

Piezoelectric surgery, laser biostimulation, low forces appliances in order to promote vestibular expansion on maxillary jaw

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Aim. The use of piezoelectric surgery and laser biostimulation applications in combination with vestibular self ligating appliances and palatal expanders were investigated in order to stimulate the expansion of maxillary. The purpose is to avoid the LE FORT 1 surgery, usually indicated as the correct way to resolve molars and/or premolars inversions. Piezoelectric surgery, with vertical sections on alveolar bone, between the roots of the teeth involved in the treatment, is utilized in order to facilitate the vestibular movement of the alveolar bone around the teeth, laser biostimulation with diode lasers, in order to improve the cellular activities and the periodontal regeneration, self ligating appliances have a low periodontal impact and allow us to achieve a good alignment, palatal expanders improve a vestibular expansion with low forces.

Methods. 4 patients are selected in this protocol research. All patients, in the range of age between 21 and 34 years, refused LE FORT 1 surgery in order to have maxillary expansion. Every tooth involved in surgical/orthodontic expansion doesn't have loss of periodontal tissues (no CAL loss or gingival recessions). The average of expansion needed is 2.6 mm. No BOP and CAL loss at the start of the orthodontic treatment. Every patient was treated in the first surgical/orthodontic visit with piezoelectric surgery, with vertical sections on alveolar bone, between the roots of the teeth involved in the treatment; at the same time was applied a self ligating appliance (Time3, Empower, American Orthodontics) and a palatal expander. At the end of the first surgical/orthodontic visit, every patient was treated with diode laser biostimulation (Wiser /Lambda, G8 Galbiati), for 5 minutes with 600 micron fiber section, on utilizing the Biostimulating machine parameters (2/4 watt, focalized or defocalized, on depending the laser machine utilized). No thermal effects were produced by lasers applications. In the first 2 weeks post-surgical treatment, the patients repeated 2 times a week the laser biostimulations' procedures. In every orthodontic session (each 28 days as average) the patients were treated with diode laser biostimulation, with the same protocol.

Results. At the moment of debonding, all teeth involved in the expansion were evaluated in terms of quality and quantity of attached gingiva. BOP and CAL loss was also investigated. One patient showed an inflammatory reaction around the crown of the teeth examined, with BOP +, without loss of CAL.

Conclusions. The combination between piezoelectric surgery and laser biostimulation applications, with vestibular self ligating appliances and palatal expanders shows a good result in order to stimulate the expansion of maxillary, avoiding a Le Fort 1 Surgery, without loss of periodontal tissues.

Posture-stabilometric valuation in growing subject with atypical swallow after speech therapy

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Aim. The aim of the present study was to verify the hypothesis that the patients with atypical swallow present an alteration of the plantar support and a consequent modification of the body posture.

Methods. Eleven subjects, 3 males and 8 females, 9,8 years old on the average, were included in the study. Inclusionary criteria were: 1. good healthy condition; 2. no history of vertigo due to pathologies of CNS (Central Nervous System); 3. no previous orthodontic or gnatologic treatment; 4. asymptomatic for stress conditions; 5. asymptomatic for vestibular pathologies; 6. symptomatic for atypical swallow. Posture–stabilometric valuation was performed with a combination of different visual conditions (eyes open/closed) and mandibular positions (Rest Position (RP) /Maximum Intercuspidation before and after the correction of the atypical swallow by miofunctional therapy.

Results. There wasn't any statistically significant variation of the postural assessment after the miofunctional therapy.

Conclusions. This study shows that there isn't any statistically significant variation of the postural assessment after the miofunctional therapy. However, the results are probably influenced by the little dimensions of the sample.

Prevention of medico-legal disputes in apical root resorption

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Aim. The common feature of patients who ask for orthodontic therapy is mainly aimed at improving the smile and profile aesthetics. Due to an increase in dental legal claims, it is required to deepen the concept of "defensive dentistry". In fact, the modern orthodontics, beyond the reasons of treatment, is designed to ensure correct alignment of teeth, but primarily to balance aesthetics, functionality and efficiency of dento-periodontal system. Although serious cases of apical root resorption (EARR) are rather uncommon, this process can still invalidate the results of orthodontic treatment and may rise medico-legal problems.

Methods. Current available techniques allow adequate orthodontic treatment by employment of forces that are able to determine fast and comfortable movement, in full respect of teeth and surrounding structures, thus limiting the dreaded and dangerous EARR.

Discussion and conclusions. Experience shows that the majority of the legal actions originate from the peculiar "problem areas" that the dentist must keep in mind: failure in communication, excessive expectations of the patient, insufficient prior information. In addition, clinician should take in account that the fee refund or the therapy free re-making do not raise from the effects on the professional liability insurance. Early strict appliance of preventive actions reduces considerably the risk of EARR and subsequent legal actions.

Quickness and efficiency in the treatment of class II division 1 malocclusion with Herbst miniscope appliance and self-ligating brackets

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Aim. Now we can simultaneously correct skeletal and dental Class II malocclusions with the new herbst miniscope appliance! It is designed to advance the mandible to a Class I occlusion within 6 to 9 months – while the patient is bonded upper and lower 5 to 5 with self-ligating brackets. Herbst miniscope makes it possible to combine two distinct treatment phases by achieving skeletal and dental corrections at the same time!

Methods. The sample study was composed of 10 patients, 4 females and 6 males. The pre-treatment average age of females sample was 10 years and 8 months, it was 11 years and 11 months for the males. All patients exhibited a class II division 1 malocclusion determined by mandibular retrusion.

Results and conclusions. Herbst miniscope appliance in combination with self-ligating brackets completes Class II treatment within 6 to 9 months, provides constant activation and eliminates the need for patient compliance, advances the mandible producing stable orthopedic changes and also reduces the time therapy, which is 50% shorter than in traditional appliances with activator and classical brackets.

Radicular resorption in treated endodontically teeth during orthodontic treatment

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The root resorption is a rearrangement of the tooth root and can be primary or secondary. This phenomenon, which can also be associated with orthodontic treatment, is unpredictable, inevitable and, when it involves the dentin, becomes irreparable. There are several factors involved in root resorption: it may be secondary to orthodontic treatment, due to non-biological forces, during prolonged, intrusive movements, excessive movement, or can be influenced by individual susceptibility of the dental characteristics, advanced age, the bone density, gender, type of malocclusion, and systemic conditions malnutrition. Both bone remodeling, and root resorption due to an inflammatory process. It was also seen as a force seems to produce a continuous absorption which are larger than discontinuous forces. The shortening of the roots during orthodontic treatment occurs in three forms: generalized moderate resorption (RGM), generalized severe (RGG) and localized severe (RLG). The RGM affects certain teeth more often, as the upper teeth, which have a reduced root length and average is higher than that of other teeth. Once the diagnosis of resorption must act quickly because the phenomenon can progress quickly. We analyzed the cases in terms of X-ray radiographs at the end of treatment, noting that the risk of severe resorption is much greater for the upper teeth, interested in 3% of cases compared to 1% of all other teeth. It was evaluated percentage of root resorption compared with initial and radiographs were compared the data from both groups. Although very few cases have had root resorption, it is seen that the root resorption most frequently is located. No particular difference was found between non-treated items and endodontic treatment. It appears possible and necessary, however, observe a careful protocol aimed at limiting the damage that may arise due to a phenomenon of excessive forces. Good information as to the possibility of root resorption as a complication of treatment and above all, a radiographic evaluation of teeth each 3-6 months in order to prevent too heavy forces that can lead to this complication. We conducted a study on root resorption in partnership between the Department of Endodontics and Orthodontics, University of Rome "La Sapienza", through the analysis of periapical radiographs in orthodontic treatment of subjects who had evidence submitted to endodontic therapy to evaluate the presence and characteristics of root resorption, and comparing the elements endodontically treated with untreated.

Rapid correction of deepbite malocclusion with the Function Generating Bite

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Aim. Deepbite is a severe malocclusion involving not only teeth, but the whole stomatognathic system. Its orthodontic correction needs an accurate diagnosis to choose the right therapy.

Methods. We report the clinical results of three patients ($8,2 \pm 1,3$ years old) with a deepbite malocclusion. They were treated by means of a functional appliance with an anterior double bite plane, Function Generating Bite-Deep (FGB-D).

Results. After three months only of functional therapy, the correction of the malocclusion was clinically observed in all cases.

Conclusions. The treatment of a deepbite with a functional appliance aim to create a neuromuscular balance to guarantee the stability of the result during the time. The dental correction is the logic consequence of the functional equilibrium.

Rapid palatal expansion in Juvenile Idiopathic Arthritis patients

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Aim. To get rapid expansion of the palate in patients with Juvenile Idiopathic Arthritis (JIA).

Methods. At the Department of Orthodontics, Dental Clinic of the University of Milan it looks a female 8-year-old suffering of JIA. It was prescribed a Cone Beam CT of the skull to assess the progress of the disease. It was decided to make a therapy with palatal expander. The expansion was made by the patient to perform a quarter turn of the screw expansion per day for 15 days. It was used this technique, different from the usual, to be able to check for side effects mediated by the patient's pathology. After expanding rapidly, the patient presented to regular checks for the following 6 months without complications.

Results. At the end of therapy, the expansion of the palate was successful. The results are perfectly comparable to those seen in healthy patients. The patient has not experienced joint pain or worsening of her health.

Conclusions. The rapid palatal expansion is applicable to patients with JIA, without exacerbating the disease.

Recognition of an undiagnosed synostotic syndrome

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Aim. Synostotic syndromes are autosomal dominant diseases caused by mutation of the gene encoding receptor for fibroblast growth factor 2 (FGFR2). Clinically is characterized by an early fusion of the cranial sutures, middle third underdevelopment, skeletal Class III, exophthalmos and may be present limbs deformations.

Methods. A 6 year old girl, at the first visit to "Unità Operativa di Ortodonzia, Gnatologia Clinica e Protesi Riabilitativa dell'Università di Padova" presents clinical and radiological features due to synostotic syndrome. Anamnesis shows that has never been diagnosed any syndrome. Were prescribed panoramic, skull and occlusal radiographs. On radiographs were performed: cephalic index as an indicator of changes in cranial growth and cephalometric analysis. We evidence the early closure of the palatal and cranial sutures.

Discussion. An accurate analysis of clinical features has showed the presence of a synostotic syndrome then accurately diagnosed through genetic investigation. Cephalic index showed the presence of a small cranial structure compared to the norm. Cephalometric analysis indicates a severe underdevelopment of the middle third of face and consecutive prognathism; investigations have also shown the orbital cavity underdevelopment.

Conclusions. a correct clinical and radiological assessment may be crucial in the diagnosis of congenital diseases. A synostotic syndrome identification is critical to the orthodontic therapy.

Regaining of the Leeway Space vs. distalization in lower arch

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Aim. The author proposes a new therapeutic strategy that enable the “Leeway Space” regaining in permanent teething by using of a brace for this reason called “Leeway Space Gainer”.

Methods. the author proposes the use of a new-generation brace called “Leeway Space Gainer” made up of bands on the 6/6 and the 4/4. Between the bands 6/4 is fixed a screw of connection (Screw Leone A 0623-08) and the bands 4/4 are connected on hard lingual arch. The brace is activated monolaterally at the pace of two activations per week and this way the merging system is ensured by the “pillars” of the two premolars and by the first molar which is counter-lateral to the molar we want to distalize.

Results and conclusions. The LSG in a permanent teeth dental lower arch has enabled the regaining of LS crowding leading to a simple solution a clinical case with a “true” medium-high crowding otherwise intended to an extractive therapy. The LSG brace has proved both reliability and tolerability such as to make this new therapeutic strategy a first-choice one in orthodontic treatments of dental lower arch in cases of medium-high crowding.

Relationship between malocclusion and dyslalia

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Aim. The aims of this study were to (1) highlight the relationship between malocclusions and speech disorders (2) plan a clinical approach between orthodontics and speech therapy.

Methods. 880 children between 6 and 10 years of age were examined to determine if a relationship between malocclusion and dyslalia exists. The children (448 males and 432 females) were examined by a speech therapist and an orthodontist. An examination of their face and oral cavity was made to verify the relationship between malocclusions and dyslalias.

Results. Correlations were found between malocclusion and dyslalia. There were 55 cases of temporomandibular joint (TMJ) abnormality (6.3%), but none among dyslalic subjects. Facial asymmetry affected dyslalic and nondyslalic subjects in the same way, each presenting 32 cases (3.6%).

Conclusions. The alteration effect of dyslalia on speech organs and oral cavity exists. The effect of malocclusion on dyslalia seems to be more relevant, more frequent and to increase proportionally, depending on the severity of the malocclusion.

Relevance of torque value in effecting smile esthetic

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Aim. this study was performed to determine the perception differences between dental specialists, laypeople and experts of art/beauty in evaluation of smile esthetic in patients with different incisal torque values.

Methods. A visual analogue scale (VAS) was used to assess perception of incisor position and smile attractiveness on smile frontal, smile lateral, and frontal intraoral photos of 10 orthodontic treated subjects. The 10 patients were divided into 2 groups for incisal torque values, measured on LL teleroadiography. The first group (low torque) had final torque values $\leq +5^\circ$, the second group (high torque) presented incisal torque $\geq +7^\circ$. Collected data were analysed by two way ANOVA with Bonferroni post-hoc test.

Results. in frontal vision layperson and dentists seem prefer patients from first group, although no significant difference occurs between the two torque groups. Orthodontists slightly prefer higher torque smile, while a significant difference is present only in judgement by artists panel. Score for incisor position and smile attractiveness were lower for lateral view and all panels rated superior second group patients. Statistically significant difference occurs between judge panels.

Conclusions. smile appeal is best appreciated in frontal vision, especially from laypeople, and depends on incisor position. In lateral view is generally preferred a labial inclination of teeth, although degree of protrusion is best appreciated by specialist operators.

Reproducibility in the assessment of Bjork's mandibular structural signs

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Aim. To identify vertical growth pattern, Bjork suggested seven mandibular structural signs: inclination of the condylar head, curvature of the mandibular canal, shape of the lower border of the mandible, inclination of the symphysis, interincisal angle, interpremolar or intermolar angle, and anterior lower face height. The aim of this study was to evaluate the reproducibility in the assessment of the vertical pattern using only Bjork's structural signs.

Methods. 50 pretreatment lateral head films were randomly selected and the mandibular part was cut off so no reference existed to surrounding anatomic structures. Then, mandibular cuttings were shown twice to a panel of 10 postgraduate students in Orthodontics asking them to determine the vertical pattern.

Results. Intraobserver agreement percentages for the 10 observers between the 2 time points varied from 64% to 88%. In other words, an orthodontic can be expected to agree with himself, on average, 76.4% of the time.

Conclusions. Based on this result, intraobserver agreement in the assessment of Bjork's structural signs is quite high but further more studies could be carried out to estimate interobserver reproducibility.

Reverse-sequencing chewing cycles in an unilateral anterior crossbite compared with an unilateral posterior crossbite

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Aim. It is well established that children with a unilateral posterior crossbite exhibit reverse-sequencing chewing patterns when chewing on the affected side. Anterior unilateral crossbite is a similar malocclusion, involving different areas of the occlusion: the anterior teeth in the incisal region. The aim of this research is to compare the prevalence of reverse-sequencing chewing cycles in a patient with unilateral anterior crossbite with a patient with unilateral posterior crossbite, during chewing on the crossbite side and on the non-crossbite side, to evaluate the different role of posterior and anterior regions of the occlusion in the masticatory function.

Methods. A 10,11 years old girl with unilateral anterior crossbite on the right side and a 7,9 years old boy with unilateral posterior crossbite on the right side have been analyzed. Masticatory cycles were recorded during chewing a soft (chewing-gum) and a hard (winegum) bolus with a Myotronics K7-I kinesiograph.

Results and conclusions. The results showed a low prevalence of reverse-sequencing chewing cycles in the patient with anterior cross-bite without any difference between the two sides of mastications as it happens, on the contrary, in the patient with posterior crossbite.

Rhinomanometric evaluation in patients with transverse contraction of the maxilla: a clinical study

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Aim. The aim of this study was to evaluate the respiratory nasal airflow in patients with transverse contraction of the maxilla, to be submitted to palatal expansion, through the rhinomanometry and the use of a fiberscope to evaluate the mechanical obstruction percentage.

Methods. 10 patients were selected (3 males and 7 females, mean age 8.6 +/- 1.1 years) within the Department of Orthodontics of the Tuscany School of Dental Medicine, University of Florence and Siena-Italy. Inclusion criteria were: transverse contraction of the maxilla, unilateral or bilateral crossbite with sliding, aged 7-11 years, no previous orthodontic treatment, no medical treatment in progress. Exclusion criteria were: deformity and craniofacial malformation syndromes. Patients were evaluated before therapy (T0) with rhinomanometry and use of the fiberscope. The same patients underwent the same examinations at 6 months after the expansion (T1).

Results. The fiberscope examination revealed: mean obstruction at T0 =60% at T1=30%, a mean baseline total inspiratory resistance at T0=1.075, at T1=0.465.

Conclusions. Our results show that the expansion of the palate has had a clinically and statistically significant improvement of the parameters taken into account.

Root resorption in a patient with Juvenile Idiopathic Arthritis

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Aim. To determine possible root resorption in upper central and lateral teeth in patients with functional device Transverse Sagittal Maxillary Expander (TSME).

Methods. The study was conducted on 81 patients, aged between 7 and 16 years, including 5 with Juvenile Idiopathic Arthritis (JIA) and 76 healthy subjects, all receiving TSME. TSME therapy was followed by all patients on a regular basis. Panoramic radiographs of the beginning of treatment were compared with Cone Beam CT of the end of treatment.

Results. We found a single case of rhizolysis in both central incisors in a patient suffering from JIA. The remainder of the patients didn't show signs of root resorption.

Conclusions. Considering the totality of patients treated with TSME, it was evidenced that can be found in 1,25% of cases rhizolysis. But if we consider only patients with JIA, the percentage would be 20%. It remains to be seen whether really exist a link between the proposed treatment and the presence of the disease.

Self ligating vs invisalign: analysis of dento-alveolar effects

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Aim. to evaluate the changes in the transverse dimension and the perimeter of maxillary arch produced by low friction self-ligating brackets TIME 3 compared to Invisalign technique.

Methods. Self-ligating sample and Invisalign group were composed by 20 subjects, Class I malocclusion, mild crowding, permanent dentition, no craniofacial anomalies and orthodontic treatment, evaluated at the beginning (T0) and at the end of therapy (T1). The measurements were made on the maxillary dental casts at T0 and T1: intercanine width between tips of the cusp (CWC) and the most lingual point (CWL), first interpremolar width between central fossae (FPWF) and the most lingual point (FPWL), second interpremolar width between central fossae (SPWF) and the most lingual point (SPWL), intermolar width between mesial fossae on the occlusal surface of the maxillary first molars (MWF) and the lingual fissure location on the lingual surface (MWL), arch perimeter (AP) and arch depth (AD). Significant differences between the treated groups were assessed with Independent Samples t test ($p < 0.05$).

Results. Statistically significant differences between self-ligating sample and Invisalign group were recorded for CWC, FPWF, FPWL, SPWF, SPWL, and AP measurements.

Conclusions. Low friction self-ligating system produced statistically significant different outcomes in transverse dento-alveolar width and perimeter of maxillary arch when compared to Invisalign technique.

SEMG activity of masticatory muscles in patients wearing Invisalign

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The aim of this study was to investigate the surface electromyographic (sEMG) activity of masticatory muscles in subjects treated with Invisalign orthodontic device for the treatment of class I malocclusion with crowding. sEMG activities of the muscles in 10 adult subjects (age 18-32 years) were recorded before the beginning of their treatment and after one month (two Invisalign appliances). Due to the small number of subjects, data were collected as Median and 25th and 75th percentiles, and the Wilcoxon signed rank test was used to test the differences between T0 and T1. sEMG activity was recorded without the appliance in the mouth, and in two conditions: mandibular rest position and during maximal voluntary clenching. This last position was normalized by using the recording of data during clenching on two cotton rolls. RMS normalized data were calculated. After one month the masseter muscle showed a significant lower sEMG activity than T0, in mandibular rest position, while no difference was observed in the sEMG activity of anterior temporal muscle. No difference between T0 and T1 was observed in the sEMG activity of muscles during maximal voluntary clenching. Invisalign therapy in subjects with class I malocclusion characterized by crowding seems to affect sEMG activity of the masticatory muscles, although the clinical significance of this observations is yet to be clarified.

Shear bond strength of metal bracket to curved ceramic disks vs.flat ceramic disks

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Aim of the study. With the increase in adult orthodontic treatment comes the need to find a reliable method for bonding orthodontic brackets onto ceramic crowns and fixed partial dentures. The study was conducted to compare the shear bond strength (SBS) of metal bracket bonded to feldspathic ceramics (IPS classic Ivoclar).

Methods. Forty (40) glazed feldspathic disks (6 mm in diameter and 3mm in height) were manufactured and divided into 2 groups. Group 1 was produced flat, group 2 was curved so as to simulate an individual brace completely customized to the shape of the teeth. Forty (40) stainless steel premolar brackets (0,022 inch Time 3, American Orthodontics) were bonded to the disks with 3M Transbond TM according to the manufacturer's instructions. Before the bonding, all samples were conditioned by applying 9,6 hydrofluoric acid for 2 minutes, followed by a silane coupling agent. The specimens were stored in water for 24 hours at 37 °C and then thermocycled (500 times, 5°C to 55°C, 30 seconds). Shear bond tests were performed with a universal testing machine (Instron Corp, Canton, Mass) at the crosshead speed of 0,2mm/min until a fracture occurs. The data was analyzed through Tukey's test with a significance level of 0,05.

Results. The study revealed that brackets bonded to curved disks had the greatest shear bond strength but it wasn't significantly different from brackets bonded to flat disks.

Conclusions. Although the specimens showed different SBS, both groups withstood normal orthodontic forces.

Sipodent: an individualized interceptive appliance

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Aim. to evaluate qualities and characteristics of the “Sipodent” orthodontic device, an individualized interceptive appliance derived from Kesling orthodontic positioner and commercially available preformed interceptive appliances.

Methods. Ten patients in mixed dentition consecutively admitted to the Orthodontic Department of Brescia Dental School were treated with Sipodent, an interceptive appliance made with an elastic material on the basis of an individualized setup in order to guide incisor eruption and mandibular growth. Patients were treated until the completion of permanent dentition, wearing the appliance all night long and four hours during the day.

Results. Correct occlusion and aesthetics were obtained in six patients. The remaining four were further treated with a simple fixed orthodontic treatment in order to correct minor remaining defects. It was possible to correct I and II class cases, with normal and deep. Open bite cases required fixed multibraces therapy and the end of the interceptive treatment.

Conclusions. Sipodent appears to be a useful and comfortable individualized device, that allow to intercept and early correct a broad range of malocclusions if used in mixed dentition.

Soft-Tissues position change with the new herbst-miniscope appliance

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Aim. To evaluate the difference between pre and post-treatment soft tissues position induced by new Herbst-miniscope appliance in the treatment of class II division 1 malocclusion.

Methods. The treated sample was composed by 10 patients, 4 females and 6 males. The sample's mean pre-treatment age was 10 years and 8 months for the females and 11 years and 11 months for the males. All subjects exhibited a class II division 1 malocclusion by mandibular retrusion. For each patient two lateral head films were available: one at the time T0, pre-treatment; and the other at T1 time, post-Herbst-miniscope treatment, at least 12 months after T0. Lateral head films were evaluated and superimposed via classical cephalometric analysis. Changes in the group were compared with student-t test and ANOVA analysis.

Results. the Herbst miniscope effects on soft tissue were tested: a mean growth of nasal prominence (OLp-prn + 3.3 mm), of filtrum (OLp-sn + 2.5 mm), of upper lip (OLp-UL + 2.9 mm), of lower lip (OLp-LLI + 4.6 mm) and also of soft tissue's pogonion (OLp-Pos 3.7 mm).

Conclusions. The Herbst miniscope appliance provides an effective correction of ugly profile generated by Class II division 1 malocclusion with a mandibular prognathism increase and so a better profile of the patient.

Straight Wire technique: direct or indirect bonding?

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Aim. The term “bonding” is used to indicate a technique to position the brackets on tooth surfaces. AIM OF THE WORK: the aim of our study was to analyze the literature by comparing two techniques, direct and indirect bonding, examining the clinical and laboratory steps of both methods, and the relative advantages and disadvantages.

Methods. we did a review of the literature using Pubmed, as search engine, and as key-words “direct bonding” and “indirect bonding” in Straight Wire. 635 articles were found. We specially considered reviews (18) and comparative studies (225). In the examined articles, we assessed the accuracy of the bonding procedure and the positioning errors (vertical, horizontal, angular).

Discussion and conclusions. positioning the Straight wire appliance with the indirect bonding allows: increased accuracy, improved direct visibility, fewer errors, reduced chair time with greater patient comfort and less physical and mental stress for the orthodontist. Costs naturally increased, but with a favourable cost-effectiveness.

Surgical and orthodontic approach to the impacted mandibular canines: a case report

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The purpose of this report is to present a case of a combined surgical and orthodontic approach in the treatment of impacted mandibular canines. The impaction of mandibular canines is considered a rarity in dental practice, the incidence range from 0,1% to 1,29%. Different treatment alternatives are available: no treatment, extraction, transplantation, prosthetic or restorative treatment, surgical exposure followed by orthodontic treatment. In our case a panoramic radiograph of an 11-years old patient revealed an impacted mandibular right canine. We have chosen a combined therapeutic approach that includes both surgical exposure and orthodontic traction of the tooth to the center of the alveolar ridge, followed by final orthodontic alignment. This patient's treatment took 2 years. A posttreatment panoramic radiograph showed a good position of the tooth in the dental arch, a well-alignment dentition with Class I occlusion and no root resorption.

Surgical disjunction vs orthopedical disjunction

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Aim. Our goal was to analyse skeletal modifications on vertical, sagittal and transversal dimension in adult patients treated with surgical maxillary expansion. We compared these results with those obtained in young subjects treated with orthopedical disjunction.

Methods. We evaluated two groups of patients, all of them presented posterior bilateral cross-bite. One group was composed by 6 adult patients, the other one was composed by 18 young patients. Before and after the treatment we take a radiography in lateral and frontal view, plaster models of dental arches and intraoral photographs for each of them.

Results. In both groups, after expansion, the transversal dimension of maxilla and nasal cavity increased, and so was the width of superior and inferior dental arches. There were no significant modifications of vertical dimension. Analyzing sagittal dimension, ANB angle tends to increase its value in patients with III skeletal class and doesn't change in I ad II class.

Conclusions. Orthopedical palatal expansion in young patients and surgical expansion in adult patients results to be the first choice of treatment for vertical dimension discrepancy, regardless of skeletal class and vertical relationship. II skeletal class II and skeletal open-bite could not be considered as an absolute contraindication for disjunction.

The need for a multidisciplinary approach to obstructive sleep apnoea's treatment: role of the orthodontist

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Because of the pathogenesis of sleep apnoea syndrome is multifactorial, therapeutic approach will be necessarily interdisciplinary to the hypothesis that orthodontic therapy plays an important role in the treatment of OSAS in children. It is based on the fact that these patients had a change of stomatognathic structure. Children with OSAS generally have a deep bite malocclusion associated with mandibular retrusion, a contraction of the maxilla with or without cross bite. Orthodontic treatment is represented by an expansion of the upper jaw that would be able to reduce resistance and facilitate the nasal airflow transit by increasing of the breathing space in the nasal cavity. This is associated with a reduction of adenoid masses to the "volumetric" expansion. Even, a mandibular advancement favours a repositioning of the tongue in the palatal higher, resulting in a increase of the pharyngeal lumen. To achieve these objectives, the type of the orthodontic appliances used concerns in the rapid palatal expander and mandibular propulsor. In patients with OSAS, the importance of an orthopedic-orthodontic approach will have gradually assume greater dignity, and for this reason will be desirable a multidisciplinary collaboration between the pediatrician, the otorhinolaryngologist, the allergist and the orthodontist in the diagnostic and therapeutic approach of the patient with OSAS, in order to ensure a better and more complete therapeutic results.

The perception of facial aesthetics: comparison between dentists, physicians and lay person in Italy

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Aim. underscore the presence of universal aesthetic parameters in the evaluation facial aesthetics.

Methods. We have created a questionnaire to collect statistically significative dates. We have taken photos of the profile and frontal photos and next we have modified them using the program adobe photoshop to evaluate: 2. The facial symmetry; 3. The impact of smile on the face; 4. The impact of eyes on the face; 5;6. The divergence on the frontal plane with and without the variation of goniac angles; 7. The divergence on the frontal plane also including the inferior lip; 8. The divergence on the sagittal plane in the photos of profile with smile; 9. The perception of sagittality; 10. the divergence on the sagittal plane in the photos of profile without smile. The questionnaire was submitted to two populations: - 216 generic dentists, orthodontists, physicians; - 210 lay persons.

Results. in the total sample, profession influences the answer of questions 4, 7, 9 and 10. In the comparison between dentists and orthodontists, the age influences the answers of questions 2 and 4 and there is a difference in answers in questions 4 and 10.

Conclusions. dentists and lay persons have a different perception of the impact of eyes on the face and of defects of proportions on the vertical and sagittal planes. In questions 4 and 10, the majority of orthodontists chooses the original photo, unlike the generic dentists. Orthodontists are in agreement about their preferences.

The same therapeutic approach for two monozygotic twins: two different results

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Aim. We present the clinical cases of homozygous twins, affected by the same clinical problem, treated by the same operator using the same methods of treatment in both patients

Case Report. In January 2007, two monozygotic twins of 11 years occurred on a visit at the Department of Orthodontics, Tuscany School of Dental Medicine, University of Florence and Siena-Italy. Clinical examination, plaster models and the x-ray examinations (panoramic radiograph and lateral cephalometric radiographs) is found in both patients a skeletal Class III malocclusion with loss of space in the area of the upper left and the upper right canine and a probable inclusion of the upper canines. In a first phase, patients are treated with a face mask for the resolution of skeletal problems (approximately 9 months of therapy). After obtaining the correction of skeletal problem has been used for both, a fixed appliance for alignment of the dental arches. The purpose of this second phase of therapy was to get enough space to provide a natural eruption of canines held without resorting to surgery. The duration of treatment with fixed appliances has been, to date, approximately 24 months, the results obtained the following: the patient G.P. has obtained the physiological eruption of 1.3 than 2.3, for the patient NP the physiological eruption was obtained only for the item 2.3. for the dental element 1.3. it was necessary to proceed with the extraction as non-recoverable orthodontically.

Conclusions. With this couple of orthodontic cases we have tried to show that the same operator from a comparable situation (two identical twins have the same problem) using the same techniques did not reach the same result, demonstrating, as well as environmental factors may interfere and change results of orthodontic treatment.

The treatment of gingival hyperplasia in orthodontic patients: a comparison of surgical lasers

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Aim. The advent of new technologies has changed the approach to dental treatment, offering patients less invasive techniques, among them the laser is an instrument which is most frequently offered to dentist, because of its well known properties of decontamination and biostimulation, providing significant opportunities within the periodontal and oral reconstructive surgery. Also in orthodontics is possible to exploit certain features, such as in surgical orthodontic treatment of "minor" with the current research aimed to test its effectiveness in order to accelerate tooth movement. The purpose of this study is to validate the laser as a tool of choice for the resolution of gingival hypertrophy resulting from fixed orthodontic treatment and test what type of laser is the preferred route between the Nd: YAG, the diode laser and the CO₂.

Methods. A sample of 40 orthodontic patients with specific requirements has been selected. This sample has been divided into 4 groups according to the type of laser treatment to which they are subjected.

Results. We can say that, all patients treated within the 1st, 2nd and 3rd group, albeit with different types of lasers, showed significant improvement.

Conclusions. The clinical results were confirmed by detailed statistical analysis that showed statistical significance of laser therapy for the treatment of gingival hyperplasia in patients with fixed orthodontic. Regarding the significance of a type of laser over another, we need to investigate further.

The use of light intraoral elastics in phase 1 of a passive multi-torquing self-ligating technique

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Aim. planning the use of light intraoral elastics in the orthodontic treatment by a continuous arch self-ligating technique, the orthodontist needs to do some considerations about the set-up, due to the interaction between the system bracket-wire and the elastics. Even if a continuous arch technique is a statically non-determined system, a skill forecasting of forces and moments due to the elastics is very important. Aim of this paper is to give information for a correct phase 1 setup in continuous arch technique.

Methods. Literature review and clinical considerations.

Results. Reviewing the scientific literature authors pointed out two aspects to be considered before the use of intraoral light elastics: 1) general considerations about elastics employ 2) special consideration about phase 1 setup. General considerations about elastics, advantages: A) elastic strength limit B) maximum loading of the elastic (when the elastic is elongated 3 times the original diameter) C) action-reaction of a force: symmetrical action in active and reactive area D) elastics materials: the possibility to come back to the original shape after de-loading E) clinical advantages of the elastics: directly used by the patient, possibility of a discontinuous use (day-night), discarded after use, no activation required by the orthodontist. Elastics may also create some problem: progressive degradation of the material, patient's compliance (especially for the correct point of application) etc. Special considerations about phase 1 setup: A) clinical objective B) force level related to the specific tooth movement C) force distribution related to the application point: pin on bracket and employed arch (alloy and diameter) D) association with other auxiliary, especially with occlusal splints E) kind of elastics (diameter and strength) F) time between two appointments related to: kind of movement, forecasting of clinical movement speed, relation with other auxiliary specific of the phase G) risk related to a lack of control.

Conclusions. using early light elastics in planning orthodontic movement by a self-ligating continuous arch technique may be a useful biomechanical aid in treatment phase 1. It allows dental movements difficult to obtain by the simple interaction wire-bracket. It's necessary to take care about all the clinical previous consideration to get the best results from these devices.

Third molar mandibular crowding

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The problem of the late mandibular incisor crowding is a well established phenomenon, the cause of which has been the substance of considerable debate over the years. A central issue is the possible role of the third molar though no definitive

Conclusions have been consistently drawn. The aim of this review is to investigate the role of third mandibular molars in the development of anterior teeth crowding.

TMJ internal derangement treatment with passive self ligating technique

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Aim. evaluate the effectiveness of low friction self ligating system to search a physiological cranio-mandibular relationship to resolve TMJ disorders.

Methods. 33 adult patients suffering of TMJ internal derangement (meniscus dislocation with reduction) due to an altered cranio-mandibular relationship were selected. Patients were submitted to the traditional orthodontic check-up with evaluation of articular functionality through NMR (CT in case of subversion of the articular bone structure). Patients had been treated with low friction (passive) self ligating system.

Results. Low friction appliance allowed the correction of malocclusion restoring a correct discus-condyle relationship with the disappearance of the articular noise. The reduction of the parasitic movements due to reaction forces, disturbing the final mandibular posture, and the occlusal stabilization obtained with this technique solved the internal derangement.

Conclusions. the employment of low friction systems allowed to correct the malocclusion improving a better cranio-mandibular relationship. Therefore we obtained the occlusal stabilization resolving the articular disfunction: this result is due to the employment of a low friction self ligating system that enabled us to get in a correct occlusal stability solving the malocclusion. The employment of light forces reduced the reaction forces movements that can induce an altered cranio-mandibular relationship.

Tooth replantation for orthodontic purposes

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Aim. Throughout the past decades tooth replantation was considered an effective alternative to dental implant. The purpose of this study was to evaluate the possibility to use mandibular third molars as substitute for extracted first molars in orthodontic patients.

Methods. Three patients that were accepted for orthodontic therapy presented unilateral or bilateral extraction of mandibular first molars. Surgical procedure was made with conservative technique to preserve the integrity of tooth bud. Patients were followed for 24 months after replantation in order to verify tooth vitality, ankylosis, stability and roots formation. All patients received standard orthodontic treatment after stabilization of root formation. The subjective compliance with the procedure used was also collected.

Results. All the transplanted teeth were in place at the end of the observation period. Three out of four teeth maintained the vitality, no one had ankylosis sequelae and root formation continued even if in all cases roots were shorter than normal ones. Nevertheless shorter roots didn't influence tooth stability. After orthodontic forces application at this time no roots resorption occurred.

Discussion. The results of this study seem to confirm the possibility to use dental transplant to solve difficult orthodontic cases in growing patients. Vitality of teeth seems to be better preserved if transplant is made when roots formation is at the beginning, on the other side roots maturation seem to suggest a delayed approach if feasible.

Conclusions. teeth transplant in the molar mandibular area offer a new perspective in the orthodontic treatment and could be useful in preserving alveolar bone in growing patients.

Tooth recovery in lateral segments with the use of TADs

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Aim. Impaction of the lower first and second molars is not a common problem, but it is very challenging one. The correction of impacted mandibular molars could be achieved using TADs as anchorage. This technique is especially useful when segmental approach are desired

Methods. Eighteen retained teeth in 12 patients with an age interval ranging from 12 to 42 years were selected for the study. All the patients received a miniscrew near the impacted to reposition dislodged teeth. Duration of the therapy, complications encountered, age and gender of patients were registered. When minimplant was loosed an immediate reposition was made. The subjective compliance with the method used was also collected.

Results. All eighteen teeth were successfully treated. Only in one case the miniscrew was lost during the treatment but immediately replaced with no practical consequences on treatment. Average treatment time was 6 month combining distal movement and up-rigthing. Two miniscrews showed an inflammatory reaction around the head during treatment but no lack of stability of the TADs themselves or discomfort for the patients. In all the 18 cases the movement caused some form of gingival hypertrophy disappeared after the end of treatment. None of the teeth treated showed a lack of vitality during or after the procedure. All the patients demonstrated a good compliance with the procedure with a medium score of satisfaction of 9,4 on a scale from 0 to 10.

Conclusions. The non cooperative uprighthing procedure was everytime completed without delay and no significative complications arised making this treatment more predictable and acceptable for the patients.

Transverse arch dimensions in subjects with Class II malocclusion in the early mixed dentition

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Aim. The purpose of this study was to analyze the transverse dentoalveolar features of subjects with Class II Division 1 malocclusion in the mixed dentition.

Methods. 88 subjects (53 females and 35 males) with Class II, division 1 malocclusion (Class II Group, mean age 9 ys \pm 1 y) were compared to 104 subjects (66 females e 38 males) with Class I occlusion (Class I Group, mean age 9 ys \pm 1 y). The Class II group was further divided into a maxillary protrusion group and a mandibular retrusion group. Intermolar width (IMW), intercanine width (ICW), and posterior and anterior transverse discrepancy (PTID and ATID) were measured on dental casts.

Results. The Class II group showed a significantly greater negative PTID (-2.1 mm) which was associated with a significantly reduced maxillary IMW with respect to the Class I group (-2.2 mm). The mandibular retrusion group showed a significantly greater reduction both in the maxillary ICW (-1.7 mm) and in the maxillary IMW (-2.7 mm) with respect to the Class I group. The maxillary protrusion group presented with a significantly greater constriction at the maxillary IMW (-1.7 mm) when compared to the Class I group.

Conclusions. Class II malocclusion with mandibular retrusion is associated with a significant constriction of the maxillary arch with reduced ICW and IMW. When Class II malocclusion is due to a maxillary protrusion the constriction at the maxillary arch is limited to the IMW.

Treatment of class II malocclusion with functional appliances: review of literature

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Aim. Class II malocclusion is the most frequent problem in the orthodontic practice. Various types of functional appliances (e.g. Frankel, Twin Block, Herbst) are used for the correction of Class II skeletal and occlusal disharmonies. Many clinical studies have been realized on skeletal changes associated with functional appliances therapy in Class II malocclusions, but the scientific data are still controversial. The aim of the present study was to analyze the skeletal changes in Class II malocclusion cases treated with functional appliances.

Methods. An electronic search by means of Pubmed database was supplemented by a manual search of reference lists. From 35 studies, 18 were selected based upon four stringently applied criteria.

Results. This review of literature showed skeletal changes in all patients treated with functional appliances, but there were many differences inside: patients with anterior mandibular rotation obtained better results after therapy (resolution of skeletal malocclusion); patients with regular mandibular rotation needed another orthodontic treatment to improve the effect of functional appliance.

Conclusions. Patients with II class malocclusion needed treatment with functional appliance but there is an individual answer to treatment due to biological factors.

Use of tads in intrusive mechanichs in posterior area

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Aim. the use of TADs in intrusion of molars offers the possibility to achieve clinical results otherwise impossible by alternative mechanics. On the other side TADs offer a sure method to achieve vertical control in difficult cases or in periodontal compromised patients where sufficient bone anchorage was not available. The aim of this paper is to compare an intrusive mechanic that use mini-screws with a traditional one.

Methods. We took into account 9 patients in a range of age between 45 and 62 years that needed to intrude upper or lower molars or premolars. Patients were randomly accepted in the experimental group. The intrusive force was delivered by an elastic chain connected with two mini-screws. The head of the mini-screws served as reference point to evaluate speed of intrusion.

Results. Intrusion speed with mini-screws was on average higher than expected. In all the cases the period of observation was 6 months and all patients in the experimental group (intrusion supported by TADs) completed the intrusion in that period. In no cases we had a loss of a mini-screw in the experimental group but at the end of the experimental period so without effects on intrusion. No one showed an inflammatory reaction around the head of the mini-screw during treatment or lack of stability of the TADs themselves or discomfort for the patients. Pain was referred during insertion of mini-screw in 1 case easily controlled with use of additional mepivacaine injection. In all the 9 cases the intrusion caused some form of gingival hypertrophy disappeared after the end of treatment.

Conclusions. Intrusive mechanic was effective and no clinical complications arised. Mini-screws were perfectly tolerated by patients during therapy.

Vertical dento-skeletal modifications in growing subjects with deep bite

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Aim. to analyse vertical skeletal and dental modifications after elastodontic therapy in a group of growing subjects with deep bite.

Methods. 20 subjects, 9 females and 11 males, mean age 10.4, cervical stage CS2, treated by using an occlus-o-guide® appliance. The studied subjects satisfied the following selection criteria: mixed dentition, Class I or II dental or skeletal relationship, overjet >2 mm, overbite >2 mm, crowding no more than 7 mm, no history of previous orthodontic therapy. Exclusion criteria were: overjet >7 mm, skeletal Class III tendency, open bite, crowding >7 mm, TMJ disorders, face trauma, lingual inclination of upper incisors, dental anomalies. Radiographs data were taken before (T0), after six months of treatment (T1), after 12 months of treatment (T2) and after one year of retention (T3). Active treatment time was 12 months and retention period was 12 months. Particularly skeletal and dental vertical cephalometric measurements were analysed. Differences were examined by Wilcoxon's test.

Results. Cephalometric parameters analysis shows a significant improvement of vertical skeletal and dental conditions.

Conclusions. Results indicate that in growing subjects the occlus-o-guide® can be considered and used as a valid a appliance in correction of deep bite.

PEDIATRIC DENTISTRY

A RCT on paediatric patients: a new flowable resin-based composite vs traditional composite

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Presidente: Prof. Ugo Consolo

Aim The aim of the study is to evaluate the clinical behavior of aesthetic restorations in Class II preparations in primary molars by using 2 different materials.

Methods. The authors conducted a randomized clinical trial. 28 patients received 56 restorations in primary molars randomly assigned by lottery method in a split mouth technique: 28 restoration with traditional universal microfilled composite and 28 restorations with a new flowable resin-based composite. Two examiners whose technique had been calibrated, evaluated the restorations using modified U.S. Public Health Service criteria at baseline and at 3,6,9 and 12 months.

Results. After one year, there were no statistical differences between the new flowable composite and the traditional composite about Marginal Adaptation, Anatomical Form, Cavo-surface Margin Discoloration, Axial Contour, Secondary Caries and Visible Plaque Index. However, there was a decreasing odd ratio and a $p < 0.05$ between the two material about Proximal Contact.

Conclusions. At the 12-month clinical recall, the authors found no differences among the 2 materials in Class II restoration in primary molars. The new flowable composite showed a good behaviour and it was very appreciated by the patients and by the authors for its fast and easy manipulation.

β-Thalassemia patients undergoing bone marrow transplants: oral health protocol in pediatric patients

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Aim. Among blood diseases, β-Thalassemia (or Cooley's disease) represents a major public health problem in many Mediterranean, Middle-Eastern and Asian countries. In Italy there are 8000 patients with Thalassemia and 2.5 million immune carrier subjects. This pathology is the most severe congenital haemolytic anemia and its clinical signs begin at 3 - 7 months of age; it is characterized by an alteration of haemoglobin synthesis and by inefficient erythropoiesis. The main problems for these patients are the build up of iron in the heart and in the other organs, a short life of red blood cells easily attacked by the spleen, and the side effects of transfusion therapy. Medical therapy consists of blood transfusions every 2/3 weeks and daily administration of iron chelants until a bone marrow transplant (Haematopoietic Stem Cells Transplant, HSCT) from a genetically compatible donor can be effected. The aim of the work is to outline a protocol for the oral health of these patients in order to control the oral environment during medical treatments and to reduce oral lesions typical of the different stages of the disease and related therapies.

Methods. The study examined a sample of 41 subjects (aged 3-13) affected by β-Thalassemia. We defined an oral management protocol for these patients. The protocol for oral complications in the different stage of the disease, pre and post transplantation therapy consists of: oral plaque control, restorative therapies or teeth extractions, monitoring and local therapies for mucosal lesions especially in severe cases (i.e. Graft versus Host Disease (GvHD) and Mucositis). A definite protocol scheduled for the various stages of the therapies was followed: more than 30 days before HSCT, the 30 days prior to the HSCT day, the 30 days following HSCT, from 30 to 100 days from HSCT.

Results and conclusions. A correct approach allows for the maintenance of oral aseptis during the various stages of treatment and for the reduction of oral manifestations. Control of the side effects of the different therapies in the oral cavity is fundamental to the optimization of quality of life for these young patients. The clinical implication is to optimize a multidisciplinary approach in prevention and therapy.

Caries prevalence in Albanian children: epidemiological evidence

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Aim. The present study aimed to investigate the prevalence of caries disease in Albanian children.

Methods. The sample included two groups. Group A: 177 subjects aged between 2 and 12 years (mean age: 6,6 years) with negative medical history examined at schools. Group B: 123 subjects aged between 2 and 12 years (mean age 6.7 years) with positive medical history examined at the Paediatric Unit of University Hospital Centre of Tirana. Anagraphic data, medical history and dental history were collected and dmft/DMFT were calculated. Student's t-tests were performed to compare Group A with group B.

Results. Both groups presented the same diet and oral hygiene habits, and the same dmft/DMFT but these values were resulted higher than 2010 WHO targets. Particular dmft/DMFT in the 6-year-olds was 7.6 in Group A and 7.8 in Group B and furthermore children who live in rural areas were at higher risk of tooth decay of those who live in urban areas.

Conclusions. In Albania exist high prevalence of caries in children and adolescents. For this country, who still have not reached the WHO/FDI global goal 3 DMFT, this goal is the first priority.

Case report of orthodontic treatment in a growing patient using bisphosphonates

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Aim. To describe how an orthodontic treatment in a patient taking bisphosphonates, has been carried out and which have been the results.

Methods. A fifteen patient (G.A.) affected by Osteogenesis imperfecta and treated with bisphosphonates came to our attention. The main orthodontic issues documented in literature for patients with OI, are also been registered for our patient: skeletal and dental relations of class III, transversal maxillary hypoplasia, anterior and posterior crossbite. After the patient stopping bisphosphonates therapy, as agreed with the pediatrician, the treatment was started; Initially was applied a rapid palatal expander used to widen the upper jaw and afterwards was started Delaire orthopedic mask therapy, in order to get malocclusion correction.

Results. Despite the age of the patient and his predisposition to altered mechanism of bone turnover and remodelling, as well concerns associated with the use of bisphosphonates, good results has been obtained.

Discussion. The success of this case is due to selection of an individual therapeutic planning and his correct management in the time, and even less to close collaboration between orthodontist and pediatrician.

Casein phosphopeptides as protective agents in cola drinks enamel erosion

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Aim. The aim of this in vitro study was to examine if synthetic CPP-ACP could reduce enamel erosion caused by cola drink.

Methods. 25 extracted human permanent molars free of caries were used. The roots were removed and the crowns were sectioned in order to obtain 3 enamel sections from each tooth. One section from each tooth was immersed in cola drink, cola drink plus synthetic CPP-ACP and deionized water as control. Each tooth was included in one of 5 groups, with a different immersion time: 48, 24, 12, 6 or 3 hours. Enamel surfaces were analysed using SEM.

Results. SEM study of control group showed smooth surfaces with no evidences of erosion. Specimens subjected to cola drink displayed surface defects due to erosion. Specimens submitted to cola drink plus CPP-ACP showed healthier enamel, presumably due to deposited material on the surface.

Conclusions. adding CPP-ACP to soft drinks could markedly reduce their erosive potential, providing protection against dental erosion in vitro.

Cephalometric evaluation of the hyoid triangle before and after orthodontic treatment in patients having mixed dentition and infantile swallowing

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Aim. The only cephalometric parameter about tongue posture before and after orthodontics treatment is the Rocabado's hyoid triangle. The aim of the study is to evaluate the hyoid triangle before and after orthodontic treatment in patients with infantile swallowing.

Methods. for the present study 80 healthy patients were selected (both sexes, mixed dentition, 40 hyperdivergent and 40 hypodivergent). The patients were divided in 4 groups: hyperdivergent patients with infantile swallowing (group A); hypodivergents with infantile swallowing (group B); hyperdivergent without infantile swallowing (group C); hypodivergents without infantile swallowing (group D). The infantile swallowing was evaluated with Peng's method. All patients were subjected to initial lateral telerradiographs, executed in occlusion and without swallowing, in order to evaluate the hyoid triangle cephalometrically (following Rocabado's parameters). The triangle was formed searching the following points: RGN(the lowest posterior point of symphysis); H (the most upper anterior point of hyoid bone); C3 (the lowest anterior angle of third cervical vertebra). Cephalometric evaluation was performed by two different examiners in double-blind. Measurements from the groups were compared using Mann-Whitney U-test (P value ≤ 0.05).

Results. the evaluation of the hyoid triangle at the beginning and at the end of the treatment, in both groups A and B compared with C and D not subjected to orthodontic therapy, showed: an inverted but decreased triangle after orthodontic therapy in group A; a reduced triangle after therapy but not inverted as at the beginning of the therapy in group B. The statistical evaluation showed significant differences (P=0.016).

Conclusions. In both groups A and B, there was an improvement of tongue posture due to the orthodontic treatment.

Children emotional reaction in dental setting: subjective evaluation

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Aim. The present study firstly aimed to explore the affectively evaluation of dental context in children. Secondly, we were interested in investigate whether specific pathological conditions, responsible for early dental experiences and/or hospitalizations are able to differently affect this evaluation.

Methods. The sample included: 19 children (m.a=8,68y) with EDs, 19 children (m.a=9,53y) with several Chronic Sismatic Diseases and 41 healthy children, 26 boys and 15 girl, (m.a=9,44y). 36 pictures selected from IAPS (12 pleasant, 12 unpleasant, 12 neutral) and 12 pictures about dental setting were presented. A valence and arousal-rating task of each trial, were administered by means of the Self-Assessment Manikin rating system.

Results. The MANOVA (Group x Pictures Type x Gender) showed a significant main effect of Pictures Type, regardless of Group and Gender both on valence and arousal rate. Furthermore the main effect of Pictures Type was qualified by a significant interaction with Gender. Female rated dental pictures as more unpleasant and with high arousal compared to male participants.

Conclusions. Early and frequent familiarization with dental and hospital environment seems to be unable to generate an affective habituation. However, the findings suggested the peculiar affective value of dental setting together with the importance to take in a serious consideration differences between male and female young patients in order to improve dentist-patient relationship.

Comparison of Calcium Hydroxide and a resin-based canal sealer EndoRez® in endodontics of primary teeth: A case report

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Aim. Filling the root canal space of primary teeth can only be done using materials that have compatibility with the physiological process of root resorption. In the present case were compared on the same patient Calcium Hydroxide and EndoRez® filling root canals of two primary incisors.

Methods. Two primary upper incisors (5.1-6.2), of a 4 year old patient, have been evaluated. Both root canals were irrigated and instrumented equally. One incisor (5.1) root canal were filled with Calcium Hydroxide UltraCal® (Ultradent Products, S. Jordan-USA). The second incisor's (6.2) root canal were filled with a resin-based canal sealer EndoRez® (Ultradent Products, S. Jordan-USA). Radiographic controls were performed at the end of the treatment, at 6 months and at one year.

Results. At the six months radiographic control were observed a 50%, approximately, resorption of Calcium Hydroxide inside the root canal of 6.1. In contrast, the root canal filling with EndoRez® shows a slight resorption, that seems to follow the natural root apex resorption. The 1 year radiographic control showed a total resorption of the Calcium Hydroxide filling, while filling with Endorez® showed a resorption following the root resorption ensuring the success of the endodontic therapy.

Conclusions. Using a resin-based canal sealer EndoRez® may be an valid alternative in primary teeth endodontics, if further studies prove the results of this case report.

Dental education: new synergies for development of skills in autistic patients in childhood

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Aim. From the Diagnostic and Statistical Manual of Mental Disorders IV the autism is defined as pervasive developmental disorders. The possibility of prevention and dental care in autistic patient is seriously compromised. Use Education to improve the approach to the autistic patient through the educational activity to allow dental care (sealing, plaque ablation, M.I.) without general anesthesia and implement a prevention program.

Methods. The educational intervention provided by the research protocol, involves the use of individualized strategies and methodologies, and patients with non-verbal use of Augmentative Alternative Communication. The dentists Are trained educator, which acts as a filter between the patient and the team doctor. Its presence is required until the dentist, built a relationship of trust with the patient, will be able to continue independently.

Results. 14 out of 16 cases, aged between 6 and 12 years of education have responded positively to the intervention, allowing the execution of dental therapies and activating a proposed long-term prevention. Negative results are recorded with 2 patients who did not undergo any rehabilitation therapy.

Discussion and conclusions. Given the positive results obtained, the Unit of Pediatrics Dentistry, Umberto I of Rome has decided to continue the experiment on a larger series, to improve the patient's clearance in children with autism, avoiding where possible, with the educational intervention, the operating room.

Dental enamel, fluorosis and Amoxicillin

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Aim. It has been speculated that Amoxicillin use, widely used for pediatric patients for the treatment of otitis media, seems responsible for hypomineralised defects, described in literature with the term Molar Incisor Hypomineralization. This could have a significant impact on oral dental health for the widespread use of Amoxicillin in the first and second childhood. The aim of this work was to collect informations relative to the relationship between Amoxicillin and Fluorosis, in order to understand the scientific opinion on this association.

Methods. A literature survey was done by applying the Medline database (Entrez PubMed); the Cochrane Library database of the Cochrane Collaboration (CENTRAL); Search Form. Two relevant articles published between 1966 and 2011 were selected for the final review analysis.

Results. The study of Hong et al. and the study of Laisi et al. evaluated the possible association between the early use of amoxicillin and dental fluorosis during childhood, both concluding that there is a significantly elevated risk for dental fluorosis and that these effects of amoxicillin use were independent of other risk factors, such as fluoride intake and otitis media.

Conclusions. The presence of several methodological problems prevents to draw evidence-based. However, even if an evidence is not been achieved, these study suggest to restrict the prescription of this drug, making use, where possible, of alternative treatments.

Dental management of patients in children with osteogenesis imperfecta

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Aim. Osteogenesis Imperfecta (OI) is a genetic disease that affects the bone collagen. The pediatric dentist may be the first to identify and recognize the effects that this disease causes in dentistry. The goal is to create guidelines for dental management of patients already receiving OI pharmacological therapy or which still must be established therapy.

Methods. The Authors performed a literature review combining it with clinical experience gained from active collaboration between the Centre of Reference "Rare Metabolic Bone Diseases" Policlinico Umberto I - Rome and the UOC Pediatric Dentistry "Sapienza" Rome University.

Results. From the literature it is clear that an early interception of OI is the cornerstone of more effective therapies currently available and how the dentist might be able to detect some forms of OI that initially induce only apparent oral manifestations, providing early treatment and timely of events before the dental treatment of bone manifestations may hinder or impede the dental care.

Conclusions. The interdisciplinary approach given by teams of specialists helps the family to improve and those that are functional aspects of daily life, is to educate parents on what are the real needs of the child. The increasing exchange of information is also being developed by specialists in pediatric dentistry and is and will increasingly be a real element of an effective professional development and help patients and families.

ECC prevalence in nursing school

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Aim. to evaluate ECC prevalence and severity and background variables associated, in preschool children (aged 2-6), attending public nursing schools in Sassari.

Methods. Caries status was detected by one calibrated clinical examiner. Information about the socio-economic status of the family, background health of the children (pre-term birth, chronic diseases), diet regimes, oral hygiene habits (tooth-brushing frequency, fluoride consumption) was collected through standardized questionnaires filled in by the parents.

Results. 373 children were examined. Caries experience was observed in 28.69% (95%CI= 24.65%- 32.71%). Caries experience was statistically associated with educational level of parents ($p<0.01$), use of pacifier ($p=0.04$), sweet-drink before bedtime ($p=0.04$), mean numbers of meals/day ($p=0.04$).

Conclusions. Early childhood caries in children living in Sassari was associated with eating habits, family and child-care related factors and tooth-brushing.

Effects of systemic and topical fluoride on DMFT index in a pediatric sample in the province of Caserta

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Aim. The purpose of this study is to determine the influence of systemic fluoride on caries rate in early mixed dentition.

Methods. 580 Italian children (305 males and 275 females), were examined to investigate as well as caries rate, also risk factors for caries and dental anomalies. The experience of caries was detected through the counting of decayed, missing and filled teeth. It was also investigated the use of systemic and topical fluoride through tooth brushing behavior.

Results. In group undergoing systemic fluoride treatment, daily tooth brushing with fluoride toothpaste was carried out on average the same number of times compared to children who were not undergoing systemic fluoride treatment: respectively 1.7 and 1.4 times a day. Also children who had used fluoride tablets and drops had a DMFT index of 0.12 compared with DMFT index of 0.16 children who only brushed their teeth daily.

Discussion and

Conclusions. In this work the study of DMFT among children in early mixed dentition allowed us to assess the health of the first permanent molars and how systemic fluoride treatment could have influenced this index of oral health. In this sample the Mann-Whitney Test resulted not significant ($p=0.207$), systemic fluoride treatment in addition to daily topical fluoride use, through tooth brushing behavior, did not influence positively the value of the DMFT. These results show that the preventive action of fluoride on the caries disease is certainly topical.

Enamel defects in children affected by cystic fibrosis

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Aim. Cystic Fibrosis (CF) is an autosomal-recessive, chronic and progressive disease, characterized by an abnormal regulation of electrolyte transport by the epithelium and consequent alteration in the secretion of exocrine glands. The gene responsible for CF is a gene that encodes for a chloride ion channel called Cystic Fibrosis Conductance Regulator (CFTR). The aim of present study was to evaluate the enamel defects in correlation with the type and severity of genetic mutation in young patients affected by cystic fibrosis. Patients were included in a program of oral prevention and dental care.

Methods. Specimens were obtained by primary teeth extracted for orthodontic reasons or exfoliated, previously storage in 10% buffered formalin solution. Specimens were analyzed with various microscopic methods.

Results. The results of present study were similar to those present in literature.

Conclusions. CF patients have a high incidence of enamel defects (limited and diffuse discolored enamel hypoplasia in deciduous dentition that is in the permanent). Several studies demonstrated that CFTR plays an important role in the enamel formation. Recently, it was assessed that changes in both structure and composition of the enamel is due to an altered gene expression in CFTR ameloblast: this involves abnormal mineralization of enamel and altered ionic concentration. In addition, CFTR would have a role in controlling the pH during the process of enamel mineralization.

Epidemiologic study on the point of view of parents about the oral health of children

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Aim. The Early Childhood Caries is a frequent pathology of developmental age. Many studies show that it is caused, among the other factors, by a lack of knowledge of parents and by incorrect maneuver of oral hygiene of their children. To identify the level of knowledge that parents have about the correct maneuvers of oral hygiene of their children.

Methods. It was given a questionnaire of 32 questions to 250 parents of children between 2-15 years.

Results. The 61% of the parents teach their children how to brush teeth properly but the 52% don't advise their children to clean teeth more than 1 time a day. The 39% of parents change the toothbrush of their children every 3-4 months. According to the 47% of parents, it's useful to take sugars before sleep, although the 51% of them consider the sugar the food more cariogenic. The 60% cover the pacifier with sugar or honey. They affirm that fluoride is a useful tool to prevent caries (54%), but they don't know the fluoride concentration in household water (56%).

Conclusions. Parents showed a general knowledge about the oral hygiene but 1/3 of them revealed profound gaps, especially as regards: the role of fluoride, timing and techniques of teeth brushing, consequences of a poor oral hygiene and of the "sweetened pacifier". So, it would be useful to implement health education campaigns involving the parents of children and children themselves.

Epidemiologic study on the point of view of pediatricians about the oral health of children

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Aim. Also pediatricians have a strategic role in sensitization children to dental care, in order to prevent ECC. Therefore, it's required an adequate preparation of pediatricians in oral hygiene. To identify the level of knowledge of pediatricians as regards maneuvers of oral hygiene in children.

Methods. It was given a questionnaire of 55 questions to a sample of 10 pediatricians.

Results. The 90% of pediatricians know the time of eruption of teeth. The 70% of pediatricians teach young patients the techniques of teeth brushing, recommend them to clean teeth 3 times a day, and advise the parents to replace the toothbrush every 3-4 months. The 50% sensitize their young patients to oral health and consider very useful the assistance of a dental hygienist. Only the 60% recommend to bring children from 6-7 years to the dentist for the sealing of fissures. The 80% advise against the coverage of the pacifier with sugar or honey. They know the role of fluorine against teeth demineralization (90%). The 80% of pediatricians know that chewing gums with sweeteners such as xylitol help to prevent caries but they don't recommend them in younger children.

Conclusions. The analysis of data shows that over 2/3 of pediatricians have a correct knowledge of dental problems and oral hygiene. However, it would be useful to promote the update of paediatricians as regards: sealing of fissures, fluoride prophylaxis, abuse of pacifier.

Facial and dental appearance of the Williams-Beuren Syndrome: a case report

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The Williams-Beuren syndrome (WBS) is a neurodevelopmental disorder in children that present supravalvar aortic stenosis, mental retardation, characteristic “elfin facies”, “stellate irides”, and dental aberrations (small widespaced teeth). The cause is known to be the presence of a submicroscopic chromosomal deletion on one of the long arm of number 7 chromosome pair at 7q11.23, which includes the elastine gene, thus causing hemizyosity at the elastine gene locus. WBS was previously estimated to occur in approximately 1 per 20000 live birth, but a recent Norwegian epidemiological survey suggested a prevalence of 1 in 7500 (Strømme et al, 2002). Aim of this study is to describe the characteristic pattern of dysmorphic facial features of WBS, concerning dental, oral and craniofacial characteristics as reported in the literature and the interdisciplinary treatment of a 4-years-old child with WBS with special regard to morphological and functional disorders. The Authors highlight the importance of the paediatric dentist, that can be of help in the early diagnose of the syndrome, as a timely orthodontic consultation is very important to avoid further dental anomalies in WBS.

Impacted supernumerary maxillary anterior teeth

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Aim. The purpose of this study was to examine the position of supernumerary teeth removed from the premaxillary region with the aim to precociously recognize this potentially interfering condition to teeth eruption in permanent dentition.

Methods. 59 patients visited in the surgical pedodontic service at S.Gerardo Hospital in Monza were selected for this observational study. All selected patients were classified for number of supernumerary teeth in the anterior maxillary area, presence of supernumerary teeth in direct relatives, association with disturbances in eruptions, damages to roots of contiguous teeth, location of supernumerary teeth, clinical symptoms associated, time of diagnosis and position of the supernumerary teeth.

Results. A total number of 64 patients were diagnosticated for presence of 84 non-erupted supernumerary teeth. The solitary supernumerary tooth was the most frequently type found and were described 4 areas for supernumerary teeth with different characters. Twelve patients had multiple SNT. The solitary supernumerary tooth (SST) was the most frequently type found (54) (64,4 %), followed by the conoid one (25) (29,7 %), and the rudimentary one (5) (5,4 %). Permanent SNT accounted for the majority of the cases 83 (98.8%), while only 1 (1.2%) was primary ST. The main care-seeking reason was routine radiographic checks in 58 cases (69 %), followed by permanent teeth displacement 13 cases (15,5 %), failure of permanent teeth eruption with or without clinical retention of primary teeth 11 cases (13,1%) and ST eruption 2 cases (2,4 %).

Conclusions. Early diagnosis of SNT could easily be reached and this will lead to avoid the risk of subsequent clinical complication.

Incidence of dental number anomalies in paediatric patients

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Aim. The dental anomalies in permanent teeth induces functional and aesthetic problems and their recognition is necessary for early diagnosis and treatment planning. The objective of this study is to investigate the incidence of dental number anomalies in children.

Methods. In this retrospective study were analyzed 1045 panoramic radiographs, made between 2005 and 2010, in patients with age up to 14 years, in the Department of Oral Science, Chieti-Italy. In case of supernumerary teeth were registered their form, number and location. In case of dental agenesis were evaluated the number, location and most often affected teeth. In both anomalies were also considered patient's sex and age.

Results. From the radiographic evaluation were detected number anomalies in 94 patients (9%), 44 males and 50 females. Supernumerary teeth were observed in 36 patients (3.44%), 20 males and 16 females (1.25:1). Teeth agenesis were found in 58 patients (5.55%), 24 male and 34 female (1:1,4).

Discussions and conclusions. Supernumerary teeth are one of the most common dental anomalies and may be present in any area of the dental arches. In our study 83 patients (33%) had a single supernumerary element. Most frequent location was the maxilla (83.72%). Most common supernumerary tooth was mesiodens (46.51%). Cases of tooth agenesis (5.55%) found were subdivided in hypodontia (5.07%) and oligodontia (0.48%). The most frequently teeth absent were lower second premolars (45.31%).

Interdental plaque acidogenicity and caries lesion: a cross sectional study in primary dentition

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Aim. Dental caries depends on dynamically correlated factors. The main aim of this in vivo study is to analyse the relationship between plaque-pH and caries activity in subjects with high caries risk. The second purpose is to evaluate the suitability of the touch/microtouch method to measure pH of plaque.

Methods. PH measurements were performed on 157 children aged 7-9 years, with caries activity and salivary concentration of Mutans S. $>10^5$ CFU/mL, in the proximal areas of deciduous molars of maxilla, before and 2, 5, 10, 15 and 20 minutes after a minute rinse with 10mL 10% sucrose. The proximal surfaces were codified 0 if sound and 1 if decayed.

Results. After sucrose rinse, the AUC at pH 5.7 and pH 6.2 showed a statistically significant difference ($p>0.05$) between caries and no-caries proximal surfaces. Lower values of Minimum pH and Maximum pH fall were reported in caries surfaces, although the difference with no-caries surfaces is not statically significant.

Conclusions. The higher acidogenicity of the dental plaque detected in presence of a proximal carious lesion is an additional risk factor for the adjacent surface. This finding may help clinicians in treatment decisions.

Is there an association between childhood obesity and dental caries? A clinic-statistic study

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Aim. Many studies in the literature have evaluated the association between dental caries and childhood obesity using Body Mass Index (BMI), but the results obtained are often discordant. The aim of the study was to assess the association between childhood obesity and dental caries through the use of two methods of diagnosis of overweight-obesity: Body Mass Index (BMI), Dual energy X-ray Absorptiometry (DXA).

Methods. 100 patients, aged 6-12 years, underwent to anthropometric measurements, BMI calculation, DXA exam and dental examination. The dmft/DMFT index was calculated and the dental caries was assessed using visual-tactile method and X-rays. The subjects were classified in underweight, normal weight, pre-obese, obese, according to: a) age and sex specific BMI according to Cacciari growth charts and cut-offs, b) body fat mass percentage (FM%) according to McCarthy growth charts and cut-offs.

Results. According to the BMI classification, there was no significant association between increase of dmft-DMFT and pre-obesity/obesity, but according to FM% (McCarthy cut-offs) classification, the obese children had higher indexes of caries than normal weight and pre-obese subjects, both in deciduous teeth ($p=0.023$, $p=0.020$) and permanent teeth ($p=0.010$, $p=0.012$). A significant correlation between dmft/DMFT indexes and FM% was observed ($p=0.020$).

Conclusions. A positive association between dental caries, childhood obesity and body fat percentage measured by DXA was detected.

L'Esperienza della Clinica odontoiatrica in Special Olympics

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Obiettivo. In occasione dell'evento sportivo culturale di Special Olympics 2010, tenutosi a Monza durante il mese di giugno-luglio, la Clinica odontoiatrica dell'Università degli Studi di Milano Bicocca ha partecipato attivamente al progetto Special Smile eseguendo uno screening su una buona parte degli atleti partecipanti.

Metodi. Grazie ad un'equipe di odontoiatri ed igienisti volontari sono stati visitati 388 atleti. Per ogni soggetto è stato compilato un questionario anamnestico comprendente domande relative alla condizione di salute generale e alle abitudini voluttuarie, frequenza delle visite odontoiatriche. È stata successivamente effettuata una visita specialistica al fine di registrare i parametri essenziali dell'igiene orale, la presenza di carie e il livello di salute gengivale: successivamente è stata valutata la capacità e l'autonomia di ogni atleta nelle manovre di igiene orale domiciliare.

Risultati. I risultati del nostro studio indicano che : il 50% degli atleti è stato visitato almeno una volta dal proprio odontoiatra nell'ultimo anno, il 16% non presenta lesioni cariose, il DMFT medio è 9,3, il 52% del campione presenta sanguinamento provocato, il 63% depositi di tartaro, mentre l'85% manifesta abrasione delle superfici dentali.

Discussione e conclusioni. Dall'analisi dei dati si osserva patologia a carico dell'apparato stomatognatico nella maggior parte del campione osservato. Pertanto si ritiene necessario attuare a livello territoriale un serio protocollo clinico per l'assistenza dei pazienti special needs volto alla prevenzione e al follow-up, per garantire un miglioramento dell'offerta sanitaria e soprattutto della salute di questi pazienti.

Light Activated Disinfection for highly resorpted roots of primary teeth: a case report

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Aim. To treat endodontically compromised primary teeth with a high level of root resorption is impossible to perform manual or rotary endodontic instrumentation. The use of FotoSan (Isasan) was assessed as an alternative to hypochlorite cleaning and file shaping of root canals.

Methods. It was selected a patient of 8.2 ages with an abscesses lesion dependent to the tooth 8.5. At the endoral x-ray exam the tooth presents a high degree of roots resorption. It was performed chamber opening. After checking the patency of the root canals, the canal was filled with photosensitizer. Each canal is illuminated for 30 seconds with the endodontic tip attached. After washing with physiological solution, this procedure was performed a second time. Root canals were rinse with physiological solution and dry with paper points. Then, the root canals were filled with zinc oxide and eugenol cement. The patient was call to follow up after 1 week, 1 month and 5 months. At his first control, definitive composite restoration was performed in replacement to the temporary filling.

Results. After 1 week the abscesses lesion was completely solved. At the 5 months follow up the endoral x-ray exam showed the recovering of the bone cup.

Conclusions. Light Activated Disinfection could be a valuable alternative to traditional root canals cleaning and shaping of primary teeth, particularly when it is impossible to perform endodontic instrumentation due to the thinness of the root walls.

Management of traumatic dental injuries in pediatric patients

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Aim. to showed several type of surgical, endodontic and conservative treatment in dental trauma of central incisors in pediatric patients visited at the Department of Paediatric Dentistry, “Sapienza” University of Rome.

Methods. The authors proposed several cases of trauma on the permanent and deciduous central incisors in pediatric patients with different treatment modalities including conservative, endodontic and surgical treatments.

Results. In literature the prevalence of traumatic dental injuries was 17.7%. Enamel fractures and injuries involving dentine accounted for 41% and 42.5% of all injuries, respectively. The most affected teeth (89%) were upper central incisors. Only 5% of the injured teeth were treated. The male sex is more affected than female trauma and the peak occurs around 8-11 years. The most commonly reported causes were collisions (27.5%) followed by physical leisure activities and sports (14.1%) and falls (13.4%). All treatments performed were effective during the follow-up: regarding the reattachment of tooth-fragment it was found a failure of 2% due to the lack of cooperation of pediatric patients.

Conclusions. Management of dental trauma is complex and requires a comprehensive and accurate diagnostic and treatment plan. It is also important to consider the biologic, functional and aesthetic aspects, in addition to the decreased ability of children to collaborate.

Modena dental emergency service: a retrospective study of traumatic dental injuries

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Aim. Epidemiologic aspects of traumatic dental injuries (TDI) were evaluated in the permanent dentition in a sample of 26600 patients treated at the Dental Emergency Service of the Dental School of the University of Modena and Reggio Emilia, between January 2004 and December 2010.

Methods. A retrospective analysis was performed of the dental records of 1530 patients who had attended the Service following an injury to their teeth and/or mouths. Injuries were classified using the Andreasen system. Data analysis was carried out using SPSS software and Chi-Square tests were performed.

Results. Males (67.3%) significantly outnumbered females (32.7%) and the ages ranged from 8 months to 64 years. Trauma was most frequently the result of falls, accidents while playing and participating in sports activities, traffic accidents and violence. Uncomplicated crown fracture (without pulp exposure) (29.5%), avulsion (16.7%) and complicated crown fracture (with pulp exposure) (15.4%) were the most prevalent TDI. The most affected teeth were the maxillary central incisors (73.5%), followed by the maxillary lateral incisors (18.2%).

Conclusions. The prevalence of TDI in Modena, Italy, is compared to the prevalence reported in epidemiological studies in others populations. Based on the obtained data, it may be concluded that accurate policies of TDI prevention must be established with appropriate protocols for management of these lesions.

Multicenter study on 30 children HIV+. Correlation between Viral Load, plasma levels of Lymphocytes CD4-CD8 and Oral Disease Aids-related in Era Highly Active Antiretroviral Therapy (HAART)

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Aim. This study, conducted in collaboration with the Pediatric AIDS Center of the University of Padua and with the help of the Superior Institute of Health, aims to: ► Evaluate the effect of HAART on the development of immune response and suppression of viral replication through monitoring plasma levels of T-Lymphocytes & Viral-Load ► Monitor the frequency of Oral Diseases AIDS-related.

Methods. Study sample: 30 children HIV+, aged 1-14. The statistics were collected through the observation of medical records include blood/virological parameters since 1997/Jen.2010.

Statistical method. Analysis of covariance and Bonferroni Test .

Results. Some of the mean values plasma of T-Lymph→(VmpLT) & Viral-Load→(VL) in course of oral disease AIDS-related: ► 8 recurrent events (re) to Parotid Swelling+LE VmpLT→CD4Tot 1753μL;CD4% 45.9;CD8% 28.2;CD4-CD8 0.8;VL=3,9 ► 4 re to GUNA+RIOH VmpLT→CD4Tot 50.5μL;CD4% 3.6;CD8% 61.6;CD4-CD8 0.0;VL=11,4 ► 7 re to OHL+SAR VmpLT→CD4Tot 395μL;CD4% 13.9;CD8% 41.2;CD4-CD8 0.3;VL=9.1 ► 4 re Oroph.candiasis+Esoph.HSV VmpLT→CD4Tot 2.1μL;CD4% 2.3;CD8% 36.6;CD4-CD8 0.9;VL=12.3.

Discussion. Immunologic Reconstitution has reduced the frequency of Oral Diseases AIDS-related→Kaposi Sarcoma/Lymphoma Ovs 4% pre-HAART era, HCMV 0 vs 9%, Oral Candidiasis 7-93%, Parotid Swelling 30-45%; OHL 2-20%, HSV 8%; Periodontitis 1-20%, SAR 20%.

Conclusions. Concluding with a quote by A.BLOCH:"A drug is not only a molecule that inoculated into an experimental animal produces a scientific article.

Needs of orthodontic treatment in a paediatric sample from the province of Caserta, Italy

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Aim. The aim of this study was to define the prevalence of malocclusion in a sample of paediatric patients from a specific area of southern Italy.

Methods. 579 children were selected with the cooperation of local paediatricians, between June 2009 and June 2010. This study took into account subjects in the 3-8 years age interval who didn't receive any previous orthodontic treatment. Molar relationship in deciduous and permanent teeth, overjet, overbite, crossbite and midline deviation were recorded. Overjet, overbite, reverse overjet and openbite were coded according to the Index of Orthodontic Treatment Need (IONT). Statistical Analysis was performed using the Pearson's test and the interval of confidence was calculated using the Wilson Method.

Results and discussion. The main objective of this study was to evaluate the needs of orthodontic treatment in a paediatric sample from the province of Caserta, an area in southern Italy where social and ethnic background is almost homogeneous. According to our results, 10.4% of the subjects was in need of orthodontic treatment. Taking into account borderline subjects, this number increased to 18.3%. The most prevalent occlusal anomaly was the overbite, with a prevalence in females.

Oral malodor in a cohort of orthodontically treated children

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Aim. The aim of this study was to investigate symptoms, signs and risk factors associated to oral malodor in a cohort of orthodontically treated children aged 7-16 years.

Methods. The study included a total of 46 consecutive subjects attending for routine orthodontic treatment at the Unit of Pediatric Dentistry of the University of Milano, San Paolo Hospital. Patients were not affected by systemic diseases. A self-administered structured questionnaire about signs and symptoms of halitosis was given to the parents and children, after informed consent. Oral, dental and orthodontical parameters and indexes were collected during the clinical examination: plaque index, gingival bleeding index, tongue coating score, Angle class, breathing habits, Brodsky tonsils scale. Relevant data and associations among oral malodor and clinical parameters were analyzed and tested with JMP 7.1 (SAS Int.) in a MacOSX PC. Significance was set at the 5% level.

Results. 46 children were examined aged 7 to 16 yrs, mean: 11,35 yr, st.d: 2,49; 23 (50%) were females and 23 males. Parents and/or patients reported symptoms of oral malodor in 19 cases (41,3%). Mean VSC levels were slightly more elevated in female subjects than in males (f = 129,5 ppb; m = 111,3 ppb). The oral VSC level measured were over the 100 ppb cutoff point of detectable oral malodor in 26 patients (56,5%).

Conclusions. The levels of oral VSC were significantly associated with plaque index, open bite and mouth breathing habits.

Orthodontic treatment in patients with respiratory problems

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Sleep breathing disorders are mechanical ventilation and/or respiratory's alteration; they often determine physiological sleep's alteration. The most common cause of these disorders is the syndrome of obstructive sleep apnea (Obstruction Sleep Apnea Syndrome) or OSAS. The best treatment often used in these children is the adenotonsillectomy and the resolution of OSAS and snoring is very high. The application of CPAP (Nasal continuous positive airway press) in children is, however, for lack of practicality, much more limited than adults. A significant role, however, may have the orthopedic-orthodontic therapy in growing patients with OSAS and snoring. This therapeutic approach is to restore a harmonious relationship of the maxillary-mandibular joint and, hence, the dental arches, and allows us through the application of therapeutic procedures of obtaining many benefits respirators. Regarding the intra-oral device for sleep apnea and snoring, in most cases, result in a mandibular and tongue advancement associated with the activation of the genioglossus muscle and are therefore able to reduce the resistance of the upper airways, expanding the size of the oropharyngeal lumen (PAS). OSAS children may have a deep bite associated with a mandibular retrusion. These features, in particular, favor a lingual back with pharyngeal lumen reduction and PAS. In addition, in the supine position in combination with other obstructive factors described above, can cause an increase of air flow resistance with the onset of snoring before and after apnoea. This may lead to the establishment of a vicious cycle with further increase of the volume adenotonsillar stimulated from the incorrect "pattern" of breathing. It's desirable multidisciplinary collaboration between the pediatrician, the otolaryngologist, the bronchuspneumologist, the orthodontist and speech therapist (with the aim to strengthen the perioral muscles typically hypotonic in oral breathing patients and to educate the child to nasal breathing after the airway obstruction's removal) in the diagnostic and therapeutic to OSAS child in order to ensure a complete and better therapeutic results.

Ozonotherapy in dentistry: efficacy's scientific evidence and protocols used in pediatric dentistry

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Aim. Ozone, revolutionary and innovative method, is used in a lot of dental specialities. Although there was an enthusiastic dissemination, debate on the ozone-therapy's validity in dental practice is still open. To extrapolate protocols used in pediatric dentistry and to research the current ozone efficacy's scientific evidence, through a re-emergence of important literary's data.

Methods. Literature research has made to make use of publications obtained from: search engines (Pubmed, Cochrane), specific sites (Dentalozone.uk, the-o-zone.cc), manufacturers (HealOzone, Ozonytron, CMU3, Therozone), conference abstracts (IADR and AADR), and private practice's studies.

Discussion. It was possible to create two groups of publications: the first refers to the team of Prof. Lynch, while the second comprises a series of reviews that pointed out therapy's critical aspects.

Conclusions. Current scientific evidence cannot prove ozone's efficacy in treatment of carious lesions. Instead it's demonstrated ozone's high biocompatibility, its trophic-ability on the dental pulp, and antimicrobial-ability before sealing and cleaning prosthesis. Finally the cost-effectiveness is not favorable.

Patient tolerance of Er:Yag Laser in association with a new self-adhering composite for primary decayed teeth treatment

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Aim. The effectiveness of the Erbium laser in pediatric dentistry and its treatment options have long been reported in the literature. The aim of this study was to verify the Er:Yag Laser therapy in association with a new self-adhering composite, considering the tolerance of children aged between 3 and 8 years, needing the treatment of class I caries.

Methods. a group of 40 healthy children, both sexes, aged between 3 and 8 years, needing the treatment of class I caries, was selected for the present study. They were divided into 4 groups of 10 children each. In the first group the patients were treated with Er:Yag laser (Fidelis Plus II, Emmeci quattro Fotona, Italy), 200 MJ energy, 15 Hz frequency for the cavity preparation and self-adhering composite (Vertise Flow, Kerr) the cavity filling (Group A); in the second group they were treated with Er:Yag Laser and conventional light-cured composite with adhesive (group B); in the third group they were treated with turbine and diamond bur for the cavity preparation and self-adhering composite for the cavity filling (group C); in the fourth group they were treated with turbine and diamond for the cavity preparation and traditional light-cured composite with adhesive (group D). Before and after the treatments the patients tolerance was tested with the modified Wong-Baker pain level scale. The results were evaluated statistically with T Student Test.

Results. in the first group the success rate was 97%; in the second group the success rate was 93%; in the third group 89% and in the last group it was 84%. The results analyzed with T-Student test were statistically significant ($P < 0.005$).

Conclusions. The Er:Yag laser in association with self-adhering composite is very effective in paediatric dentistry and is a good treatment options.

Preformed devices in prevention of dental trauma

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Aim. In Paediatric dentistry, dental trauma are very common events, especially in childhood (1-4 years old) and during the scholar age (6-18 years old). Many dental trauma in the second group, are due to sport activities and they involves mostly maxillary anterior teeth(80%). Moreover, the trauma incidence is higher among patients affected by increased overjet and inadequate lip coverage of the maxillary incisors. The study wants to show the preformed devices effectiveness in prevention of dental trauma.

Methods. Several studies have shown that mouthguards can reduce orofacial injuries among athletes. Preformed devices in interceptive orthodontics are widely used because they are simple to use, effective and comfortable. They are built with a soft elastic silicone material which transferred elastic forces to the dental elements. Preformed devices are indicated in therapy of malocclusion related to dental trauma.

Results and conclusions. It's possible to conclude by previous arguments that features of preformed devices are particularly suggested thank to their attitude to conciliate the protective action on dental tissues to the orthodontic therapy.

Present and future damage: medico-legal aspects of trauma in deciduous dentition

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Aim. The presence of anatomical structures not yet fully developed, makes the trauma in deciduous dentition an event difficult to fit into rigid pattern evaluation. The possibility that the intrusive trauma of a deciduous element results in a permanent damage to the gemmae gives rise to an extreme variability of the subsequent results. This paper aims at indicating to the pediatric dentist the correct management of such events, even from the standpoint of forensic medicine.

Methods. Through a case study of a deciduous element trauma with injuries of the gemma of the underlying permanent tooth (morphological malformations of the crown, enamel hypoplasia and apparent discoloration), one examines the timing and sequence of steps needed to define in a fair and reasonable assessment of this type of "biological future damage." Even as regards the "actual future damage" one shows how this latter is also reflected especially in the need for restorative treatment, functional and aesthetic of the tooth permanently damaged.

Results. Since one cannot determine with absolute certainty, but even with probability, any damage to the bud of the permanent tooth following a trauma of the deciduous corresponding element is therefore not possible to immediately dismiss a claim of a hypothetical "future harm". One must, instead, wait for the eruption to take place on the permanent element to ascertain the true extent of the injury and to quantify the damage.

Conclusions. The clinical case presented helps the dentist to enrich his/her knowledge of Dental Traumatology, with new medical-legal knowledge, for an adequate and comprehensive management of these cases. A value-added of professional services consists in the adequate and correct information provided to the patient before the start of treatment, in order to provide adequate documentation to allow a reasonable compensation of the damage, present and future, suffered from the small patient with a increased level of satisfaction of the parents for the professional service provided by the pediatric dentist. In this Manner the dentist enriches his/her performance, Achieving safe, targeted and Satisfactory.

Prevalence of dental caries, periodontal diseases and malocclusion in a sample of obese adolescents

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In a cross-sectional study design, we tested the hypothesis whether childhood obesity is associated with the presence of a particular malocclusion, dental caries and periodontal diseases. Obese adolescents with a mean age of 14.5 years were clinically examined with respect to dental caries, visible plaque accumulation, gingival inflammation in terms of bleeding on probing as well as overjet, overbite, molar and canine classes, position of midline, and TMJ diseases. Obese patients showed some characteristics in their occlusion, which defined a particular category; a multivariate logistic regression showed significant associations. The results indicate the characteristics of periodontal diseases, dental caries and occlusion of obese adolescents.

Prevention in Dental Traumatology: observational study on a group of young basketball players

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Aim. The dental injuries have an incidence of around 25% in the adolescent population (8-13 years) practicing sports. The use of a oral protection device (mouth-guard) may lead to 0% injuries resulting from these traumatic events. An observational study was conducted on a group of young teenagers, playing basketball, who agreed to wear a mouth guard during the game with the intention to verify the compliance to prevention project.

Methods. The sample was examined after 3,6,12 months from starting of the study: after 3 months, 50% of the sample had discarded the continued use of the oral protection device, after 6 months only 30% still used it. After 12 months, 25% of the sample constantly wore the mouth guard and a further 10% claimed to wear it only during official games.

Results. There is a documented decline of attention to methods of prevention over time, in our sample 65% of the young players, after six months, has totally lost the motivation wearing designated prevention equipment.

Conclusions. It requires greater attention to methods and preventive activities reinforcing the motivation time long, increasingly in case of subjects in their adolescent age.

Promotion of Oral Health: a Model of Preliminary Epidemiologic Research on Children in Evolutive Age

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Epidemiological studies on oral health and hygiene of the population leaving in a given territory are important - to evaluate different prevention programmes previously adopted; - to develop dental services; - to quantify the influence of each etiopathogenic factor on oral health. During the school year 2009-2010 an epidemiological study has been carried out on the prevalence of cavities in 330 children, age 3 to 11, in order to plan oral health promotion according to the needs of that specific community. The potential developments of a specific prevention programme may have a social relevance: in fact, it is widely acknowledged that the costs for treatment are much higher than the costs for the accomplishment of any prevention programme. The statistical analysis of the anamnestic, clinical and behavioral results in relations to some parameters (such as gender, frequency of toothbrush use, socio-economic class, plaque and cavity index) turned out as irrelevant, but it becomes relevant in relation to a poor use of toothbrush, sugar consumption, meal frequency and cavity index. From a global analysis of the gathered data, no relevant differences in gender have come out. It has emerged though that about 8% of sampled children does not practice regular any oral hygiene, 49% seldom does and the remaining 43% practices daily oral hygiene.

Radiodiagnostic Procedures in Paediatric Years

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In medicine, X-ray examinations make an important contribution in assisting the clinician in the diagnostic phase. This irradiation has a biological cost for the patient, especially in the paediatric population. Under the direction of Mr. A. Pola PhD, Mrs. D. Corbella Dr, Mr. G.M. Grasso Dr and Mr. F. Triulzi Dr the project "Radiodiagnostic Procedures in Paediatric Years" (Annex 1 to the Lombardy Region Decree n.13465, 2010) has been undertaken. The key objectives of the project are the systematic collection of technical data relating to exposure to ionizing radiation for diagnostic purposes in the paediatric population; the organisation of a platform for statistical data analysis and risk estimates; the participation in the international network according to the directions of the report "Biological Effects of Ionizing Radiation"; the access to the radiological data history of individual paediatric patients through the Regional Services Card, Lombardy Region-Italy; follow-up protocols for selected categories; the cultural training of doctors, dentists and paediatricians on radiological hazards and radiation protection; the creation of a guide for the prescription of diagnostic examinations and the setting up of a website for information and updates. This work will present the data of CT scans performed in 2007 and 2008 in the Lombardy Region, on which basis it is reasonable to conclude that there may be an excessive and unwarranted use of this radiographic instrument.

Radiographic Evaluation of Possible Dento-Alveolar Changes Through the Use of Occlus-o-Guide

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Aim. To evaluate the different kinds of distortion following to the use of an eruption guidance appliance, such as impacted canines, teeth axes alterations, apical resorption and crestal bone loss.

Methods. The orthopantomogram of 50 patients were compared pre-treatment and after-treatment, using an eruption guidance appliance such as the Occlus-o-Guide. This preformed elastomeric appliance is used to correct the II class malocclusion and deep bite.

Results. Searching for the earlier conditions, we observed the lack of crestal bone loss and apical resorption, but a very low rate of retained canines.

Conclusions. According to our results the preformed functional appliance Occlus-o-Guide does not cause crestal bone loss neither apical root resorption; such as the canine retained is not iatrogenic, but the position of the teeth at the beginning of the therapy was compromised; instead investigating about the teeth axes, we noted a better localising of them, so that an eventual future fixed therapy will be much less traumatic.

Radiological evaluation of root resorption in deciduous molar and growth of premolars in the age of development

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Aim. Root resorption is a physiological process that allow deciduous teeth esfoliation and permanent teeth eruption. The aim of this study is the radiographic valuation of the resorption of deciduous molar in relation with the growth of the premolars.

Methods. 63 patients were selected and divided into 9 groups depending on the age of the first (t0) and the second (t1) panoramic radiograph.

Results. There isn't difference between group A, B and C, depending on sex, of the length and the speed of resorption. More difference we noted in group D, in which females present the resorption more quick than males. Since group C, root resorption increases in first deciduous molar; instead, for second molar, the process remains constant until group H, in which acceleration occurs. For the growth of the premolars, we can say that, in the group A, first and second premolars present the same length, while, until the group B, the first premolars grow more than the second; the speed in the growth of the second premolars increase in group G, H, I.

Discussion. This preliminary study try to define a standardize evaluation of root resorption and dental growth, depending on sex and age, and may help clinicians to predict the physiopathological conditions in the age of development such as delay of eruption and dental ritention.

**Relationship of temporomandibular disorders, headache and orthodontic treatment in children.
Systematic review**

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Temporomandibular disorder (TMD) is a common name for a series of pathologic conditions which can lead to a disturbed and altered function of the stomatognathic system. Most of these conditions are of a multifactorial etiology, which can pose difficulties in obtaining a precise and accurate diagnosis. Accordingly, accurate diagnosis of TMD requires proper identification and classification of the dysfunction, as well as recognition of the mechanism and origin of pain occurrence. The aim of the study was to determine from a literature review of the subject whether there is significant evidence to support a relationship between headaches and TMD prevalence in children from 3 to 12 years. A second purpose was to determine from such a review whether treatment of the TMD condition with orthodontic therapy can result in meaningful reduction or resolution of headaches. In the literature, there was a substantial amount of evidence for a positive relationship between TMD and the prevalence of headaches, and most importantly, that these were the muscle tension-type. It generally showed in numerous patients that TMD treatment resulted in significant improvement in the physiological state of the masticatory system. Reduction or resolution of muscle tension-type headaches that were present was clinically significant. The authors concluded that TMD should be considered as a possible causative factor for headaches and orthodontic therapy could resolve headaches in patients with this affliction. Resolving headaches at an early stage in their development might result in the reduction of its potential for progression to a chronic condition.

Replantation of teeth with extra-oral dry time > 60 minutes

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Aim. This study aims to assess if the extraoral endodontic approach, in the case of replantation with extraoral dry-time > 60 minutes, is the treatment of choice.

Methods. Were selected 56 patients, that have a dental element with extra-oral dry-time > 60 minutes but less than 24 hours. In all teeth extraoral endodontic treatment was performed prior to replantation. Mean observation period was 48 months; at every follow up it was carried out a clinical and radiographic evaluation. Postoperative outcomes were classified as functional healing (FH), infection-related (inflammatory) resorption (IRR) and replacement resorption (RR).

Results. 18 teeth healed with a functional periodontal ligament (functional healing), 36 teeth exhibited replacement resorption, which was succeeded by IRR in 9 teeth after observation periods of more than 20 months. 2 teeth exhibited early infection related resorption. All teeth rescued in physiologic conditions (15 teeth) exhibited FH. Discolorations of tooth crowns or other complications were not observed.

Conclusions. Extraoral endodontic treatment seems to prevent early IRR and minimizes the overall incidence of IRR. It also seems to prevent RR. We had no discoloration, no root fractures, less radiographs, less time consumption, less costs. Extraoral endodontic treatment is then recommended before replantation.

SEM evaluation of interface between ionomer-based materials and surface coating

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Aim. Surface protection for glass ionomer cements (GIC) increases the quality and the durability of the cements. The interfaces between a resin-modified glass ionomer cements (RMGIC) and a highly-viscous glass ionomer cements (HVGIC) and their proprietary surface coatings was compared with SEM analysis.

Methods. Twenty specimens were made and divided in 2 groups (n=10): IXC; Fuji IX/G-Coat Plus (GC). VFG. Vitremer/Finishing Gloss (3M). Using silicon moulds were obtained samples of 4 mm wide by 5 mm in length with a height of about 2.5 mm, to obtain I class restorations. Restorations surface were covered with their proprietary coatings. Specimens were sectioned perpendicular to the restoration surface, with sections parallel to long axis of the surface, with low-speed diamond blade and with microtome. Samples were prepared and metallized for SEM examination at a magnification from x40 to 2000 and an accelerating voltage of 8-10 kV.

Results. IXC presents a better interface between restoration material and coating than VFG. While with the IXC air bubble are not notice at 1000x, with VFG bubbles will begin to be seen at 400x.

Conclusions. Lower viscosity of GICs leads to a low contact angle between resin and restoration surface, and then it favors the presence of gaps in the interface between the two materials. HVGIC surface protections are more durable than RMGIC ones and improve for longer time GICs qualities.

Skeletal maturation in obese patients: Leptin's role

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Aim. The objective of this study is to evaluate whether or not obese patients who are undergoing physical growth present a precocious skeletal maturation and whether or not this can be linked to an alteration of hormonal parameters and more specifically to an increase in leptin levels.

Methods. 50 subjects all of Caucasian race, between the ages of 6 and 15 years old. Among these, 25 (11 females and 14 males, average age: 9.8 ± 2.11 years old) were suffering from obesity (BMIs: 2.934 ± 6.64) and formed the test group while the other 25 subjects (15 females and 10 males, average age: 10.3 ± 2.83 years old), were normal weight subjects (BMIs: 0.096 ± 0.575) and constituted the control group. The difference between skeletal and chronological age was determined for each subject using Greulich and Pyle's carpal analysis method. Also, hormone tests have been evaluated in order to individuate which ones may be involved in the process of skeletal maturation.

Results. In regard to the discrepancy between skeletal and chronological age, a significant difference was found ($p < 0.05$) between the test group (11.8 ± 11.4 months) and the control group (-3 ± 3.4 months). Furthermore, laboratory research has shown a significant increase in leptin and insulin and a decrease in LH, FSH and IGF-1 values in the test group.

Conclusions. obese patients undergoing physical growth present a precocious skeletal maturation compared to normal weight patients. This data is particularly important for a correct diagnosis and an early orthodontic treatment. Moreover, the analysis of the hormones that may be involved in the process of skeletal maturation seems to highlight an active role of leptin in skeletal growth at the level of skeletal growth centres even though all the mechanisms involved in craniofacial development are still to be fully comprehended.

Space management in mixed dentition with a self-ligating dental appliance: a case report

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Aim. Although little is known about the optimal orthodontic force, it is widely assumed that the correct orthodontic tooth movement occurs under a small and continuous force. The use of self-ligating brackets, such as the Damon system, is an important way to manage space in mixed dentition, reducing treatment time with respect to traditional fixed orthodontic therapies. A passive self-ligation mechanism has the lowest frictional resistance than any other ligation system.

Methods. In this work, the authors describe a clinical case involving of a 12-years-old patient who showed a dento-alveolar alteration in the lower arch, with a space absence for 4.3 eruption. A passive self-ligation mechanism, the Damon 3MX, was chosen by the authors to reduce the treatment time.

Results. Although the treatment is ongoing and 4.3 is still lower than the occlusal plane, the arch space for this dental element is increasing significantly.

Structural differences of deciduous teeth in patients with coeliac disease

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Aim. To assess the existence of structural differences between the hard tissues of primary teeth of coeliac patients and patients without coeliac disease.

Methods. 36 children were included in the study. 18 children with coeliac disease were between 5 and 12 years old and 18 healthy children were between 6 and 11 years old. Twenty-eight teeth extracted due to destructive caries in exfoliation or due to orthodontic reasons in patients with coeliac disease and 28 teeth was analyzed for healthy patients. After storage in 10% buffered formalin solution, specimens were analyzed using polarized light microscopy, transmitted light microscopy and scanning electron microscope (SEM).

Results. The SEM analysis performed on samples of coeliac patients revealed irregular enamel prisms. Polarized light microscopy showed in coeliac patients teeth an irregular enamel prisms near the cusp, compared to the radial distribution of the enamel prisms of healthy patients. Coeliac patients display also an alteration at the level of the dentin-enamel junction that was more irregular and less defined than the clear line of demarcation on teeth of healthy patients.

Conclusions. this study suggested an alteration of the tooth enamel and of the dentin-enamel junction in patients with coeliac disease. This method could be an additional aid in the minimally-invasive and early diagnosis in detecting subclinical/silent form of coeliac disease.

Surgical and orthodontic treatment of dentigerous cyst: description of a clinical case

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Dentigerous cysts, after radicular cysts, are the most frequent lesions we can find in the maxilla and mandible bone. Through a case report, we confirmed what literature states: surgical intervention (marsupialisation) and then orthodontic tractions are effective in eruption of teeth associated with dentigerous cysts in young patients. A 7 years-old patient came to our attention because of a swelling on right superior maxilla; he had not the right maxillary incisors in the arch yet. After a careful study of the case, we diagnosed a dentigerous cyst with inclusion of the right maxillary incisors. First of all we did a surgical intervention of marsupialisation to obtain a progressive reduction of the lesion and an increase of bone density. Three months after the intervention we already observed an important reduction of cystic cavity and spontaneous eruption of the teeth associated with dentigerous cyst, although in a wrong position. We have been waiting for six months after the surgical intervention and then we started the orthodontic traction to allow a correct lining-up of permanent lateral and central incisor in arch. In conclusion, we confirmed, as literature reports, that surgical and orthodontic treatment is the best way to treat a dentigerous cyst and encourage the eruption of teeth associated in the right position.

The influence of dental malocclusion on the development of otitis media in children: a case control study

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Aim. Children with acute otitis media (AOM) can have varied skeletal patterns and occlusions with constricted or non-constricted dental arches and open bites or deep dental overbites. The purpose of this study was to investigate if a dental malocclusion could be a risk factor for otitis media in children.

Materials. A case-control study was carried out involving 321 children, selected from those who had their routine dental examination at the Department of Paediatric dentistry of Sapienza, University of Rome. The case group (n=84) was made up of individuals with one or more attacks of AOM in their history. The control group consisted of 237 randomly selected children without otitis media. All patients underwent orthodontic clinical examination by a single paediatric dentist.

Results. The most frequent type of malocclusion in the case group was increased overjet (42%), followed by anterior openbite (35%) and posterior crossbite (27%). Only 20% of children was affected by deepbite. The percentage of malocclusion in the case group was of 85%, while in the control group the percentage was of 48%. Open bite was significantly associated with AOM as was mouth breathing.

Conclusions. Previous studies examined the relationship between dental malocclusion and middle ear disease, with different results. In our study, the association between anterior open bite and otitis media was statistically significant.

The use of MTA in paediatric dentistry: a review of literature

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Aim. Paediatric dentistry have successfully employed Mineral Trioxide Aggregate in a variety of endodontic applications since the late 1990s. Based on its superior biocompatibility and its high sealing ability, MTA is considered an excellent medicament able to maintain pulp vitality and promote healing. Aim to evaluate the scientific evidence base of use of MTA in paediatric dentistry. Protocols of utilization were considered and clinical success was analyzed in comparison to others materials.

Methods. Using electronic search, all papers published from 2006 to 2010 on the use of MTA in paediatric dentistry were identified.

Conclusions. in primary molar treated with direct pulp and pulpotomy, MTA shows similar efficacy in comparison with other materials, however it is recommended in particular cases where it is necessary to keep the tooth in the arch. In the treatment of apexogenesis and apexification MTA is considered the medicament of choice, with long term success, near to 100%.

Use of bromazepam in pedodontic patients: our clinical experience

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In most cases, pedodontic patients seek a dentist when they notice discomfort or pain in the dental area. However, since they are not aware of what will happen and they happen to be in an unfamiliar place, they may experience a sense of foreboding. It has been demonstrated that dental fear can persist throughout adolescence and may lead to rowdy behaviour during dental care or to total loss of interest in the treatment. The dentist should be able to identify this sense of fear in children and to teach them some fear management techniques such as tell-show-do, relaxation and modelling techniques, as well as analgesia and hypnosis. Our study includes pharmacological anxiolysis through bromazepam-induced depression of consciousness. This method allows patients to respond to verbal commands; respiratory and cardiovascular functions are not involved.

PERIODONTICS

A comparison between measurements made with a conventional periodontal pocket probe and an electronic pressure probe: preliminary results

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Aim. the aim of this work is to evaluate, from a statistical point of view, if the results obtained from probing with an electronic probe (FP, Florida Probe[®] Company, Gainesville, FL, USA Infomedica, Italia), gauged with a constant force of 25 grams, could depend on the operator, once operators have been instructed in the correct use.

Methods. We have selected 50 patients, 13 females and 12 males. Among these patients only 9, following various clinical and diagnostic examinations, have been included in this protocol of research. We have performed six measurements for every single tooth. These measurements have been carried out by three different operators, with traditional manual probes and an electronic pressure-sensitive probe (Florida Probe).

Results. considering the statistical value of the variation coefficient, the differences in measurement obtained from the three operators with an electric probe are lower than those taken with manual probes.

Conclusions. from the preliminary results of this experimental research it seems that "Florida Probe" can reduce the error margin caused by the use of manual probes. Besides, the computerized system of the "Florida Probe" allows to create electronic periodontal files, charts and statistical comparisons with the following instrumental measurements, using the obtained clinical values.

A comparison of the success of root resection and implant therapy in multirooted teeth

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Aim. The purpose of this study is to compare the success rates for root resection with the success rates achieved by implant therapy in the treatment of periodontally involved multirooted teeth.

Methods. The studies which assessed the prognosis of hemisected molars and the studies which evaluated the results of molar position implants have been examined and compared.

Results. The failure rate for root resections ranges from 0 to 38%; the failure rate for molar implants ranges from 0 to 10%.

Conclusions. Although implants have achieved a high success rate, it is important to underline that the studies about implantology concern implants with single crowns in molar areas, that the implants placed with sinus graft have been left out and that the follow-up of implant therapy has been carried out over a shorter time. Moreover, the medical and legal considerations which may affect the dentist's choice are not to be neglected.

Alveolar bone regeneration in human by using hard tissue engineering with bone marrow mesenchymal stem cells: Case Report

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Aim. Different techniques have been used to obtain periodontal regeneration; recently, mesenchymal stem cells (MSCs) have been proposed to be a promising biomaterial in regenerative medicine. We realized a Phase I trial on a limited number of patients, which aim was to evaluate the possible toxicity of the grafted biomaterial and MSCs bone regeneration potential.

Methods. MSCs were collected from the bone marrow of the patient selected for this study, isolated and cultured in complete medium (α -MEM). Subsequently, they were treated with osteogenic medium, seeded in three-dimensional collagen scaffolds and incubated. The root planing was executed in all sites with probing depth equal or greater than 4 millimetres. Three months after the last session of root planing surgery was performed in the most compromised site with probing depth greater than 5 millimetres. The defect was completely clean and scaffolds were placed in order to fill it entirely. Each month after surgery a new orthopantomography and new blood tests were prescribed.

Results. No signs of systemic and local toxicity were observed. The re-evaluation of the sounding done after six months showed an improvement of the clinical attachment level and the periapical radiography after six months revealed a little radiopacity in the regenerated site.

Conclusions. MSCs grafting in periodontal defects is a safety procedure and can lead to the healing of treated sites obtaining bone regeneration.

Analysis of survival rate and peri-implant tissue stability of implants placed in revascularized fibula free flaps for the reconstruction of maxillo-mandibular defects. A long-term study

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Aim. The objective of this study is evaluating the behaviour of perimplant tissues and the dental implants survival rates in revascularized fibula free flaps used in the reconstruction of maxillary defects due to extreme atrophy.

Methods. From 1993 up to 2004 eight patients have been treated with this procedure and 50 bone implants were positioned. The cumulative survival rate (CSR), the crown to implant ratio and the months of prosthetic loading were then evaluated. Other clinical records considered were Δ PPD, Δ REC, BOP and VPI.

Results. Follow up of prosthetic rehabilitation is $7,3 \pm 4,2$ years. During the observation period 2 implants only were removed. Despite of the high implant survival rate (96%), a relevant number of sites presented a high peri-implant bone level loss ($5,4 \pm 2,3$ mm).

Conclusions. The analysis of results demonstrated that this surgical technique is efficient in extreme atrophy rehabilitation, stressing the importance of periodontal support therapies and of the prosthetic design in the maintenance of a healthy peri-implant state.

Clinical effectiveness of a platelet-rich fibrin membrane and allogenic bone graft in the treatment of human periodontal intrabony defects. A case series

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Aim. The aim of this study was to evaluate the clinical effectiveness of a platelet-rich fibrin (PRF) membrane used in combination with an allogenic bone graft (ABG) in the treatment of periodontal intrabony defects.

Methods. Five systemically healthy, patients, each one with 1 deep intrabony defect were treated. Clinical and radiographic parameters were taken at baseline and 6 months after surgery. Preoperative pocket depth (PPD) and attachment level (CAL) averaged 9.2 mm 12 mm respectively. After elevating a full-thickness flap and carefully polishing the defect, ABG was placed into the defect and a PRF membrane covered the defect's area.

Results. In all patients, 6 months after surgery, the radiographs showed the complete defect filling and the formation of new cortical bone; mean PPD was < 3mm and mean CAL gain was > 4.5 mm.

Discussion. The combined use of ABG and PRF membranes may lead to optimum clinical results in the treatment of intrabony defects thanks to the osteoconductive properties of the graft and the bioactive properties of PRF. Besides, PRF membranes are easier to apply in comparison with absorbable membranes and their high biocompatibility allows better tissue integration reducing the risk of exposure.

Conclusions. This study shows that using a PRF membrane in combination with ABG may represent a therapeutic option to treat intrabony defects. Histological studies are needed to demonstrate the occurrence of a true periodontal regeneration.

Clinical evaluation of Coronally Advanced Flap (CAF) + Mucograft® in isolated recession defects. Case reports

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Aim. Primary goals of mucogingival surgery have changed with time from increasing the band of keratinized gingiva to providing predictable root coverage solving patients' aesthetic demands. Various different surgical techniques have been utilized to augment gingival tissue dimensions. A review comparing the free gingival graft (fgg), the connective tissue graft (ctg) or the coronally advanced flap (caf) in recession coverage revealed non considerable difference between the individual treatments. In order to improve the predictability of complete root coverage, a new technique has been developed using the caf in conjunction with ctg; even if this approach showed improved clinical outcomes, it may be associated with significant patient morbidity due to the wound at the palatal donor site. Instead of using allograft material or autologous transplants, a promising option of avoiding patient morbidity is the use of collagen matrices from animal origin, such as mucograft® (mg).

Methods. Following administration of local anesthesia, the flap is designed with two vertical releasing incisions and then elevated in a split-full-split fashion, the exposed portion of the root is scaled using (as needed) chisels, curettes and finishing burs and then conditioned with EDTA for two minutes to remove the smear layer, finally thoroughly rinsed with sterile saline. The mg is cut to size and placed over the dehiscence defect. Subsequently, the root surface and mg will be covered with the caf: the tissue flap is secured slightly coronally of the cej by the use of a sling suture placed at the papilla, using non-irritating sutures.

Conclusions. CAF combined with Mucograft® may result in an improved outcome in terms of percentage of root coverage, soft tissue thickness, keratinized gingiva (KG) and patient satisfaction. So it can be concluded that the use of the Mucograft® results superior to the standard treatment of recession defects using a CAF procedure alone.

Clinical evaluation of the additional use of Diode Laser, in the treatment of periodontal disease

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Aim. The aim of this study was to analyse the impact and evaluate the potential benefits of the laser therapy, added to non surgical periodontal therapy, in periodontal disease.

Methods. 20 patients, affected by generalized moderate periodontitis, but without any form of periodontal therapy in the last six months, were enrolled for the study and their biometric periodontal parameters were assessed. The protocol followed during the study was: A first session of mechanical debridement and oral hygiene instructions; one or two sessions of scaling and root planing followed by gum pockets treatment, by a Diode Laser. Plaque index, by O'Leary Plaque Control Record, was assessed during each appointment. A 5 minutes subgingival irrigation, with clorexidina 0.12%, was performed at the end of each treatment. All clinical measurements of the first control were re-evaluated after a 4 weeks interval.

Results. All biometric periodontal parameters, in particular the CAL and the BOP, showed a significant improvement. A greater compliance of the patient was observed.

Conclusions. Within the limits of this study, the laser therapy was found to provide additional clinical benefits to non surgical periodontal therapy, assuring less pain, less bleeding and root sensitivity discomfort to the patient, during the treatment.

Coronally advanced flap versus connective tissue graft in the treatment of single gingival recessions: a randomized study

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Aim. To compare the clinical outcomes of coronally advanced flap (CAF) versus coronally advanced flap plus connective tissue graft (CAF+CTG) in the treatment of single gingival recessions.

Methods. We studied 221 healthy subjects showing 1 single gingival recessions Miller I & II (one recession for each patient). Patients were randomly divided in to two groups: control group (G1-CAF) and test group (G2-CAF+CTG). Non-specific parameters and periodontal indexes were evaluated at baseline, subjective indexes and clinical outcomes were evaluated once a week up to 4 weeks after surgery and at the 3-month, 6-month and 1-year. Comparison data was performed using non-parametrical tests, Spearman correlation and seemingly unrelated regressions ($\alpha = 0.05$).

Results. G1 (mean age 37.3 years) consisted in 70 (62.8% F - 37.2% M) and G2 (38.6 years) in 151 subjects (58.3% F - 41.7% M). Clinical improvement were reported in G1 and G2 between baseline and 6-months and 1-year recording as probing depth (PD), complete root coverage (CRC), root covering (mm & %), recession depth (RD) and recession width (RW), keratinized tissue (KT) and dentin hypersensitivity (DH). However, CRC, KT and DH resulted significantly better and root covering, RD and RW borderline better in G2 than G1. Spearman and multivariate analysis showed that smoking, plaque index (PI) and marginal inflammation (MI) were in correlation to endpoint clinical outcomes.

Conclusions. CAF and CAF+CTG are effective to treat gingival recessions. However, CAF+CTG seems to be more effective to achieve and stabilize the obtained outcomes. Besides, smoking, PI and MI were able to thwart surgical results with an exponential growth even causing worse outcomes than at baseline.

Crevicular fluid analysis and clinical evaluation of inflammatory response to experimental gingivitis in gingival recession defects treated by bilaminar technique

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Aim. The aim of this split-mouth study was to investigate the levels of interleukin-1 beta (IL-1 β) in gingival crevicular fluid (GCF) after experimental gingivitis of teeth treated with connective graft procedure.

Methods. GCF samples were collected from 38 teeth, 19 treated with bilaminar technique 1 year before and 19 controls. The patients were asked to refrain from performing any oral hygiene procedures for 15 days. At this time the sample collection was repeated. After measuring GCF volume the samples were analyzed for the detection of IL-1 β concentration by ELISA test. Plaque Index (PII), Gingival Index (GI) and Angulated Bleeding Score (AngBS) were also recorded before and after the no-cleaning phase.

Results. At the baseline the GCF volume and IL-1 β concentration was higher in the test than in the control sites. After experimental phase the GCF volume and IL-1 β concentration increased in both the groups but with a different ratio, higher for the control sites. Nevertheless the clinical results showed a higher GI and AngBS in control than in test sites although the same PII.

Conclusions. Despite the clinical healing after 12 months from the surgery, the different behavior following induced gingivitis should suggest a different susceptibility to de novo plaque accumulation.

Do periodontal indexes change during the day? A cross-sectional study

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Aim. To track periodontal screening and recording (PSR), full-mouth plaque score (FMPS) and full-mouth bleeding score (FMBS) and analyze if these indexes are susceptible of significant changes in the day's run.

Methods. We studied 11 healthy subjects (6 F & 5 M), treated for gingivitis and fit in periodontal maintenance phase. The age, gender, number of cigarettes per day (NCD), the number of teeth (NoT), PSR, FMPS and FMBS were recorded at baseline (T0), before performing causative therapy and during periodontal maintenance phase. Three recordings were performed on different times - 8.30 (T1), 11.30 (T2) and 14.30 (T3) in one day after causative therapy for gingivitis elimination and during maintenance.

Results. Results. at baseline were: age 35.3±9.4 (M±SD), NCD 46.4±6, NoT 28±0.8, PSR 1.8±0.3, FMPS 47.1±17.0, FMBS 17.3±7.3. No differences were recorded in smoking habit among T0 and T1,T2,T3. T1-T3 NoT resulted 27.5±0.8. T1 records were: 0.9±0.3 of PSR, 22.2±11.7 of FMPS and 4.8±3.0 of FMBS. T2 results were: 0.8±0.3 of PSR, 19.3±9.3 of FMPS and 2.7±1.5 of FMBS. T3 indexes resulted: 0.8±0.3 of PSR, 16.8±7.6 of FMPS and 2.0±1.5 of FMBS. Significant differences were recorded in all dental parameters between T0 and subsequent recording (T1-T3) but not in NoT. A significant difference among maintenance phase recordings was stated only for FMBS. Splitting the patients in smokers and non-smokers, maintenance phase difference persisted only in smokers.

Conclusions. Causative therapy confirms its great significance in periodontology but smoking seems to be able to improve clinical outcomes and change in a short time inflammation index. This effect could suggest an effective way of periodontal damage by smoking.

Effect of low power laser treatment in human keratinocytes

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Aim. Laser is a high technology device used in different settings, such as civil, industrial, commercial but mostly in scientific research. In Dentistry has become pivotal for curing mucous membrane diseases as well as for parodontal, endodontical and aesthetical therapies. Laser exists in different forms; in this study we used diode laser. In dentistry, laser may be used to perform surgical procedures, to bio-stimulate soft tissues, to sterilize radicular channels in endodontical therapy and to activate bleaching agents in aesthetics. Photodynamic therapy (PDT), is a treatment based on the combined action of three key factors: light, oxygen and photo-sensibilizer. Among different clinical applications, PDT is also used to treat bacterial, fungal, viral and parasitical infections; in this case, it is denominated PACT (photodynamical antibiotic chemotherapy), currently used to cure infections of the skin and of the oral cavity, which in dentistry may be represented by periodontal infection and peri-implantitis.

Methods. Human keratinocytes (HaCaT) have been treated with PACT, a source light represented by diode laser and a photo-sensibilizer consisting of blue of toluidine, a phenothiazine colour. Cells have been treated with a low and high power diode laser following by incubation at 37°C in a 5% CO₂ atmosphere for 72h. After incubation, cell vitality test tox-8 has been performed.

Results and conclusions. Either toluidine or high and low power laser treatment significantly reduced vitality of keratinocyte monolayer. To confirm those data, there was a reduction of the protein concentration, assessed by bicinchoninic acid assay (BCA) performed in different samples. Data are expressed in µg/ml of proteins. The dramatic reduction of protein content in samples treated with toluidin and laser appears to be very clear.

Effectiveness of an ozonated essential oil (Oleozone) as adjunctive in non surgical periodontal therapy. A pilot study

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Aim The aim of this study is to analyze the properties of ozonated sunflower oil (Oleozone) as adjunctive in non surgical periodontal therapy. It is proposed to compare results of traditional scaling and root planning (C:control) against scaling and root planning with pocket irrigation and topical application of ozonated sunflower oil (T:test). Results will be determinate according to probing pocket depth (PPD) at baseline and 1 month following initial therapy.

Methods. 384 sites were randomly assigned to T and 402 to C, according to split mouth design on 5 patients. Shapiro-Wilk's test verified that distribution was not gaussian. Percentage rates (PPD at 1-month/PPD at baseline) \pm standard error were used to describe data. T and C were compared using Wilcoxon test for paired samples. According to PPD, data were divided in 3 groups (0-3mm, 4-6mm, >7mm) and evaluated by the Kruskal-Wallis analysis of variance. Alpha level was set at 0.05.

Results. The decrease of PPD between baseline and 1-month for T was 33.19% and 25.21% for C; this difference was statistically significant (Wilcoxon test: $Z=-7.914$, $p=0.0001$). PPD media at baseline was 5.76 ± 0.10 for T and 5.30 ± 0.09 for C; at 1 month it was 3.82 ± 0.07 and 3.87 ± 0.07 respectively. Mean PPD decreased of 1.94mm [95%confidence interval (CI) 1.88-2.08] in T and of 1.34mm (CI 1.30-1.51) in C. The decrease of PPD between baseline and 1-month was significant in all 3 groups of PPD($p=0.0001$), but higher in T. The bigger difference in PPD reduction when comparing T against C was observed in shallower pockets.

Conclusions. With the limitation of this study, the adjunctive use of ozonated oil during initial preparation demonstrated significant clinical benefits in a short period when compared with S-RP alone.

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Conclusions. With the limitation of this study, the adjunctive use of ozonized oil during initial preparation demonstrated significant clinical benefits in a short period when compared with S-RP alone.

Effects of Low-Level Laser Irradiation on proliferation and differentiation of human Mesenchymal Stem Cells seeded on a three-dimensional biomatrix: in vitro pilot study

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Aim. Mesenchymal stem cells (MSCs) from bone marrow are a recent source for tissue engineering. Several studies have shown that low-level laser irradiation has numerous biostimulating effects. The purpose of this trial was to evaluate the effects of Nd:Yag laser irradiation on proliferation and differentiation of MSCs induced into the osteoblastic lineage.

Methods. MSCs were collected from adult human bone marrow, isolated and cultured in complete medium (α -MEM). Subsequently, they were treated with osteogenic medium, seeded in three-dimensional collagen scaffolds, and incubated. We used six scaffolds, equally divided into three groups: two of these were irradiated with Nd:Yag laser at different power levels, and one was left untreated (control group). Evaluations with specific staining were performed at 7 and 14 days.

Results. After 7 days, proliferation was significantly increased in scaffolds treated with laser, compared with the control scaffold. After 14 days, however, laser irradiation did not appear to have any further effect on cell proliferation. As concerns differentiation, an exponential increase was observed after 14 days of laser irradiation, with respect to the control group.

Conclusions. Laser certainly has a positive effect on proliferation and differentiation of MSCs induced into the osteoblastic cell lineage. Its clinical application could lead to a reduction in healing times and potential risks of failure.

Efficacy of a combined zinc-gluconate, taurine and cetylpyridinium-chloride oral-rinse and toothpaste combination in reducing halitosis and gingivitis insurgence in fixed orthodontic patients: a clinical evaluation

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Aim. To assess the efficacy, sole or combined with a toothpaste, of a zinc-gluconate, taurine and cetylpyridinium-chloride (CPC) oral-rinse in reducing halitosis and gingivitis insurgence.

Methods. 18 orthodontic patients were randomly divided in 3 groups of 6. Two weeks after a professional oral hygiene, instruction and motivation session (t0) Plaque Index (PI), Gingival Index (GI), Periodontal probing Depth (PD) and Odor Score (according to Rosenberg's method) were recorded. Control group A used toothbrush without toothpaste; group B additionally used twice a day tested mouthrinse; group C used also a toothpaste with same active principles. After one month (t1) measurements were repeated, a professional oral hygiene session was performed and group B and C were crossed. Finally after one month (t2) measurements were again recorded by the same blind operator.

Results. measurements obtained were analyzed by a third blind operator. PI, GI and odor score were statistically ($P < 0.05$) higher in the control group than in the group using the oral-rinse; moreover they were higher in the group using the oral-rinse than in group using oral-rinse and toothpaste. There was no statistically significant difference regarding PD.

Conclusions. mouthrinse used in this study was effective to prevent halitosis, plaque accumulation and gingival inflammation in periodontal healthy orthodontic patients, especially if associated with a zinc-gluconate, taurine and CPC toothpaste.

Enamel Matrix Derivative and autologous bone in the treatment of degree II mandibular furcation involvement. Clinical report of 3 cases

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Aim. The purpose of the present study was to describe the effectiveness of the regenerative treatment of mandibular molar degree II furcation involvements using Enamel Matrix Derivative (EMD) and autologous bone (ACBP).

Methods. 3 patients affected by moderate periodontitis, with 3 mandibular molar class II furcation involvements were enrolled. Clinical parameters (vertical/horizontal PD, CAL, REC) and radiographic data were taken at baseline and 6 months after surgery. After elevation of a full-thickness flap, the furcations were accurately polished and conditioned by EDTA 24% for 2 min before placing EMD and ACBP.

Results. Significant PD reductions and CAL gain were recorded 6 months after surgery with no or minimal REC. The radiographic evaluation confirmed these results.

DISCUSSION: The simultaneous use of EMD and ACBP in the treatment of degree II furcations showed to be capable in significantly improve PD and CAL. This technique leads to similar results as compared to the simultaneous use of membranes and bone, as reported in the Literature. Furthermore, the EMD/ACBP combined technique, may avoid the disadvantages that may occur with the use of membranes (i.e. exposure, gingival recession).

Conclusions. This clinical case series suggests that regenerative technique using EMD and ACBP is an effective procedure in the treatment of mandibular degree II furcation involvements, offering clinical results similar to other combined regenerative techniques.

Enamel matrix proteins in the treatment of horizontal bone defects. A longitudinal controlled clinical study

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Aim. The aim of the present study was to evaluate the effectiveness of the adjunct of enamel matrix proteins (EMD) to a Simplified Papilla Preservation Flap (SPPF) in suprabony defects (test-group) in comparison with Open Flap Debridement (OFD) alone carried out with the same technique (control-group).

Methods. 20 patients with horizontal bony defects were enrolled. The test-group was treated with SPPF + EMD, the control one with SPPF alone. Pocket depth (PD), attachment level (AL), gingival recession (GR) and radiographic bone level (BL) were recorded at baseline and 6 months after surgery.

Results. PD and AL significantly improved 6 months after surgery in both groups, but better results were observed in the test group. In fact, PD reduction was similar between the two groups, but AL gain was about double and GR was almost half in the test group if compared to the control one. The bone level did not change significantly in both groups. **DISCUSSION:** The use of EMD in suprabony defects leads to better results if compared with OFD thanks to EMD regenerative, angiogenic and anti-inflammatory properties.

Conclusions. The results of this study suggest that combining EMD and SPPF in the treatment of suprabony defects leads to greater PD reduction as a result of a greater AL gain rather than significant GR. Our results suggest that the use of EMD may be a good clinical option for the clinician to treat horizontal bone defects, especially in aesthetic sites.

Evaluation of clinical and microbiological effects of non-surgical ultrasonic mechanical instrumentation in association with a new local gel compound containing sodium hyaluronate and aminoacids in periodontitis patients

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Aim. to evaluate the clinical and microbiological effects of ultrasonic mechanical instrumentation (UMI) in association with a gel compound containing sodium hyaluronate and aminoacids (Aminogam®; Errekappa Euroterapici, Milan, Italy) in periodontitis patients.

Methods. 26 periodontitis patients underwent a session of UMI and received a professional application of Aminogam® gel. Self-performed gel applications were prescribed for the following 7 days. Clinical and microbiological parameters were assessed at baseline, 7, 30 and 90 days following the treatment.

Results. A significant reduction in GI, GCF, PPD, CAL as well as the counts of total perio-pathogens and red complex species was observed after treatment.

Conclusions. UMI in association with Aminogam® is effective in reducing periodontal disease parameters and sub-gingival perio-pathogens correlated to periodontal disease in advanced periodontitis patients. The adjunctive effect of Aminogam® to UMI need to be further investigated.

Full mouth plaque and bleeding score at 4 vs 6 sites. Is there a difference?

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Aim. The purpose of the present study was to calculate and compare the Full Mouth Plaque Score (FMPS) and Full Mouth Bleeding Score (FMBS) obtained examining 4 or 6 sites per tooth.

Methods. A total of 107 patients affected by moderate to severe periodontitis have been included in a maintenance programme from at least 2 years. In. The clinical variables have been recorded 1-2 weeks after an appointment of professional oral hygiene by a single operator. Full Mouth Plaque Score and Full Mouth Bleeding Score have been calculated considering 6 sites per tooth and then re-calculated considering 4 sites per tooth. Two multilevel logistic regressions for FMPS and FMBS have been performed at 3 levels: patient, tooth and site.

Results. The mean Full Mouth Plaque Score was 38.3% on 6 sites and 29.9% on 4 sites. The mean Full Mouth Bleeding Score was 58.9% on 6 sites and 51.4 on 4 sites. Based on these data, there was a difference of 8.4% between the FMPS calculated on 4 sites with respect to the FMPS calculated on 6 sites. A similar trend resulted for FMBS, with a difference of 7.5 %. Patient variables are not associated with plaque accumulation, while tooth and site variables resulted statistically significant.

Conclusions. In the 4 sites evaluation the lingual interproximal sites are not considered; from this study it was observed that these sites showed more plaque accumulation and inflammation than the others. As a consequence, this recording method generates an underestimation of the clinical condition of the patients.

Genetic test and periodontal disease: a pilot study

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Aim. Periodontitis initiated by specific bacteria that activate host mechanism destroying bone and connective tissues that support the teeth. It has a relative high prevalence in the population, representing the greater cause of tooth loss. Like any other inflammatory condition, periodontal disease might pose additional risk for susceptible people, contributing to serious diseases such as coronary heart disease and stroke, preterm low birth weight babies, and the regulation of blood glucose level in diabetics. At the present time, diagnosis in periodontal is limited. The role of genetic factors in periodontal disease is now recognized and genetic susceptibility test became commercially available.

Methods. In this work has been presented a new genetic test called "G.P.S", Genetic Periodontal Disease (Biomolecular Diagnostic Firenze). Following the literature data in this test is evaluated: Cytokine gene polymorphism in particular: IL-1a(-889); IL-1b(+3954); IL-1RN(+2018); IL-10(-1082G/A, -819C/T, -592C/A); IL-6(-174G/C); Metabolism-related gene: polymorphism (Vitamin D receptor (VDR TaqI); COX-2(-765G/C).

Discussion and conclusions. Even if the literature data about the role of genetic in periodontal disease is evaluated strongly, at the moment it is difficult to find out the recombination fraction in which all the parameters can give us a result of clinical importance.

Impact of poorly controlled type II diabetes in periodontitis: immunohistochemical study of angiogenetic markers

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Aim. Angiogenesis can be involved in tissue repair or damage. VEGF and CD34 are important angiogenetic markers in periodontal tissues homing. The purpose of this study was to assess the impact of poorly controlled diabetes on angiogenesis in subjects with and without periodontal disease. Material and

Methods. We examined 40 gingival tissue samples: 10 of patients without periodontal disease and with good controlled type II diabetes (HbA1c<7, A group); 10 of patients without periodontal disease and with poorly controlled type II diabetes (HbA1c>7, B group); 10 of patients with periodontal disease and with good controlled type II diabetes (HbA1c<7, C group) and 10 of patients with periodontal disease and with poorly controlled type II diabetes (HbA1c>7, D group). The immunostaining of tissue samples were made using the streptoavidin-biotin peroxidase technique, after incubation at 4 °C overnight with antibodies against VEGF and CD34.

Results. The expression of CD34 was statistically different between C and D groups or between A/B and C/D groups ($p<0.05$), but not comparing A and B groups. In A and B groups the expression of VEGF was significantly reduced in both epithelial tissues and submucosa ($p<0.05$) compared to C and D groups. In D group, VEGF was strongly expressed at both epithelial and submucosa level compared to C group. Further, in C group, VEGF expression was higher at epithelial level compared to the submucosa.

Conclusions. In periodontitis simples, the poorly controlled diabetes patients showed an increased angiogenesis compared to good controlled diabetes individuals. In simples without periodontal disease, the effects of poorly controlled diabetes not seem to be significant on angiogenesis changes. The increase of angiogenesis in periodontitis subjects with poorly controlled diabetes could explain, in part, the high degree of periodontal inflammation and the course of periodontal disease in these subjects.

In vitro effect of nicotine on the angiogenesis induced by growth factor-2 fibroblasts (F.G.F.-2)

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Aim. International epidemiological evidence showed a link between smoking and periodontal disease, even though the exact pathogenic mechanisms still remains unclear. Nicotine is absorbed by the oral mucosa and may interfere with angiogenesis and wound repair mechanisms. The aim of this study was to evaluate the effects of nicotine on isolated endothelial cells and fibroblast growth factor 2 (FGF-2). Nicotine was able to impair the function of fibroblasts by reducing cell proliferation, reducing the ability of periodontal ligament to adhere to dental root, inducing vertical bone support and decreasing gingival vascular flow, which is the main risk factor for implant loss. Presence of vessels inside a tissue is due to a phenomenon called angiogenesis, which is controlled by different factors playing in favour or against this process; one of the most important is represented by the (FGF 2).

Methods. PAE cells have been cultured in 0,5% gelatin with DMEM + 10% of FBS. FGF-2, Nicotine, sq-22536, fk, either alone or in combination have also been added. Zymographic assay has also been performed on 10µL of terrain separated by 7,5% polyacrylamide gel + gelatin 0,2%.

Results. and discussion. The only presence of nicotine is not able to induce the formation of cellular aggregate. On the contrary the addition of FGF determines a meaningful increase in the length of the cellular aggregate. Nicotine treatment was not able to induce angiogenesis nor to potentiate the angiogenic effect provided by FGF. On the contrary, it determined a significant reduction of the FGF-mediated angiogenesis. This anti-angiogenic effect may help to clarify the mechanisms behind the high prevalence of implant loss among smokers.

Influence of periodontal surgery on the state of the pulp

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Aim. To evaluate the relationship between the periodontal surgery and post-surgery sensibility.

Methods. 15 patients were selected for the study. 10 were treated with resective periodontal surgery, 2 with regenerative surgery and 3 with an open flap debridement. Pulp tests and vitality were performed with a Medi Tester (Dental Medica, Italy), whereas dental sensibility was assessed through a visual analogue scale (VAS) before surgery (t0), after 1 week (t1), 4 weeks (t2) and 8 weeks (t3). Controlateral tooth was considered as control group. Collected data were analyzed to evaluate statistical differences between groups among time (Wilcoxon Signed Rank Test and Friedman ranks ANOVA, $p < 0,005$).

Results. Pulp test showed no significant differences between the surgery groups and with no variation among time. Post-surgery sensibility values were statistically significantly higher in the group of the treated teeth when compared to the control group, at t1 ($p = 0,004$) and t3 ($p = 0,008$).

Conclusions. The clinical evidence suggests that periodontal surgery does not influence pulp vitality but determines an increased dental sensibility during the first week after surgery.

Influence of the smoking status on the clinical and microbiological effects of non-surgical ultrasonic mechanical instrumentation in association with a new local gel compound containing sodium hyaluronate and aminoacids in periodontitis patients

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Aim. to evaluate the clinical and microbiological effects of ultrasonic mechanical instrumentation (UMI) in association with a gel compound containing sodium hyaluronate and aminoacids (Aminogam®; Errekappa Euroterapici, Milan, Italy) in smoker and non-smoker periodontitis patients.

Methods. 6 smoker e 13 non-smoker periodontitis patients underwent a session of UMI and received a professional application of Aminogam® gel. Self-performed gel applications were prescribed for the following 7 days. Clinical and microbiological parameters were assessed at baseline, 30 and 90 days following the treatment.

Results. Smoker and non-smoker patients showed similar variations in clinical attachment level, probing pocket depth and the counts of periodontal pathogens.

Conclusions. UMI in association with administration of a gel compound containing sodium hyaluronate and aminoacids seems similarly effective in the treatment of smoker and non-smoker periodontitis patients.

Is the subepithelial connective tissue graft technique more predictive than coronally advanced flap in the treatment of multiple gingival recessions? A randomized study

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Aim. The goal of this randomized controlled trial was to compare clinical outcomes of coronally advanced flap (CAF) versus coronally advanced flap plus connective tissue graft (CAF+CTG) in the treatment of multiple gingival recessions.

Methods. We studied 20 healthy subjects showing multiple gingival recessions (Miller I & II). Patients were randomly divided in two groups: control group (G1-CAF) and test group (G2-CAF+CTG). Non-specific parameters and periodontal indexes were evaluated at baseline, subjective indexes and clinical outcomes were evaluated once a week up to 4 weeks after surgery and at the 3-month, 6-month and 1-year. Comparison data was performed using non-parametrical tests ($\alpha = 0.05$).

Results. Both G1 (mean age 47.7 years) and G2 (44.7 years) consisted in 10 subjects. One multiple recession was considered for each patient (39 single recession in G1 and 36 in G2). Significant clinical improvements were reported in G1 between baseline and 6-months and 1-year recording as recession depth (RD) and recession width (RW). The complete root coverage (CRC) was stated in all cases until 4-week and significantly lesser at 1-year. The same results were observed in G2 but not for CRC which remained effective over the time. Between the groups, no significant differences were stated at baseline but significant better results were obtained in G2 as plaque index (PI) and dentin hypersensitivity at intermediate recordings.

Conclusions. CAF and CAF+CTG are effective to treat gingival recessions. Within the limit of this study, both the surgical procedures guaranteed similar results. However, CAF+CTG seems to be more effective to stabilize the obtained outcomes.

Laser therapy in gingival hyperplasia: a case report

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Gingival hyperplasia is an increase in volume of the gingival tissue, together with an increase in the number of cells. The gingiva is reddish or red-bluish, with an increased size both in coronal and bucco-lingual direction and with a loss of knife-blade morphology. It is soft, presents with bleeding on probing and can be classified from atopographic and etiopathogenetic point of view. The therapy varies according to its origin and nature: it ranges from etiologic therapy, which is the removal of their irritating stimulus, like in inflammatory hyperplasia, to surgical therapy. A 14-year-old female patient was treated with laser therapy, presenting with a reddish gingiva and bleeding on probing in the upper maxilla. Around the teeth number 13 – 23 there was a deep-red sessile mass, characterized by easy bleeding. The diagnostic hypothesis was epulis, but there was no histological confirmation so it was identified as gingival hyperplasia. Laser therapy proved advantageous because it was painless for the patient, no need of anesthesia and gingival incisions. After 15 days, the objective clinical examination revealed perfect healing of gingival lesions.

Long-term -14 years - root coverage outcomes of CAF technique. A randomized controlled clinical trial

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Aim. This long-term 14-year-randomized split-mouth study aimed at evaluating (1) the outcomes of two different methods of root surface modifications (root surface polishing vs. root-planing) used in combination with coronally advanced flap (CAF) and (2) the long-term results of CAF performed for the treatment of single gingival recessions.

Methods. Ten patients with similar bilateral recessions ≥ 2 mm were selected for a split-mouth randomized design study. Exposed root surfaces were assigned to receive polishing (test sites) or root planing (control sites). A multilevel model were used to analyze data at 3 months, 1, 5 and 14 years.

Results. One patient dropped-out after 1 year. At 14 years recession depth was 0.9 (1.2) mm for test sites and 0.9 (0.9) mm for control sites. The interaction between treatment and keratinized tissue (KT) was significant ($p=0.0035$). Recession depth increased slightly over time ($p=0.0006$) in both groups.

Conclusions. Comparatively, polishing (test) obtained minor residual recession depth when baseline KT was > 3 mm and root planing (control) obtained minor recession depth when baseline KT was < 3 mm. Apical shift of the gingival margin occurred in 39% of the sites over time.

Network Meta-analysis: a new statistical approach. Application to root coverage procedures

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Aim. The aim of this study was to perform a Bayesian Network Meta-analysis to evaluate outcomes of several root coverage procedures and compare the results of this new statistical approach to those obtained by standard pair-wise meta-analyses.

Methods. The dataset of this study is based on a previous systematic review by Cairo et al. (2008) on treatment of Miller Class I and II gingival recessions. A Bayesian Network Meta-analysis model (Lu 2004) for Recession Reduction (RecRed), including 22 trials and 6 treatments (CAF, CAF+CTG, CAF+BM, CAF+EMD, CAF+ADM, CAF+PRP) was performed. Direct evidence from single trials was available only for 6 from a total of 15 possible pair-wise comparisons. Thus, data for the other 8 comparisons was missing. Network Meta-analysis was performed using WinBUGS software (Spiegelhalter 2002).

Results. The ranking of treatments was the following: 1. CAF+EMD; 2. CAF+CTG; 3. CAF+ADM; 4. CAF; 5. CAF+BM; 6. CAF+PRP (Tab.3). CAF+EMD and CAF+CTG showed the highest probabilities of being the best treatments (respectively 0.64 and 0.26). The mean difference of CAF+EMD was 0.14 mm greater than CAF+CTG.

Conclusions. Network Meta-analysis permitted to draw conclusions on treatments never directly compared in RCTs. Direct evidence on the comparison of the two more effective combinations of treatments, CAF+EMD and CAF+CTG, was missing, but NM model allowed for analyzing this treatment contrast. Moreover, a ranking of treatments was obtained.

Orthodontic-Aided Extraction of Impacted Third Molar to Improve the Periodontal Status of the Neighboring Tooth

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Aim. In the present clinical report, we describe the management and the long-term (3-year) outcome of a periodontally compromised lower second molar healed by orthodontic-aided extraction of the neighboring impacted third molar.

Methods. A healthy 21-year-old woman referred signs and symptoms of pericoronitis of impacted tooth 48 and periodontal injury on the distal aspect of tooth 47. The wisdom tooth was surgically exposed, and an orthodontic appliance was anchored to the neighboring teeth to stimulate eruption. After 5 months, third molar could be easily extracted.

Results. Three years after extraction, clinical and radiographic controls revealed a complete healing of the periodontal defect.

Conclusions. Orthodontic-aided extraction of impacted third molars may improve the periodontal status of the neighboring tooth. This protocol is not free from drawbacks and limitations and should be applied only when third-molar extraction is associated with a concrete risk of postoperative complications.

Osseous resective surgery. Use of rotatory instruments versus piezoelectric instruments. Clinical and biomolecula study. RCT split-mouth

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Aim. The aim of this study was to investigate the differences of healty of hard and soft tissues in patients with chronic periodontitis after ORS. The analysis was clinical and biomolecular.

Methods. Eight patients was treated with split-mouth ORS. One surgery was done with manual and rotatory instruments and the other site was treated with piezoelectric instruments. Probing pocket depth (PPD), clinical attachment level (CAL), gingival recession (REC) were recorded at baseline and at 1, 3, 6, 12 months after surgery. Level of Interleukin 1 β was recorded before the surgery and after one week.

Results. PPD amounted to 3,76 \pm 0,60 mm and REC amounted to 0,71 \pm 0,54 mm before piezoelectric surgery, instead, at 1 year PPD amounted to 2,08 \pm 0,27 mm and REC amounted to 1,95 \pm 0,59 mm. PPD amounted to 3,57 \pm 0,82 mm and REC amounted to 1 \pm 0,94 mm before traditional surgery, instead, at 1 year PPD amounted to 2,19 \pm 0,18 mm and REC amounted to 2,05 \pm 0,4 mm. Biochemical analysis by PCR showed IL-1 β mRNA relative expression consistently much lower after piezoeletric surgery.

Conclusions. The results of this study showed that the piezoelectric instruments and manual and rotatory instruments were comparable in clinical results, but the sites treated with piezoelectric instruments showed a lower level of Interleukin 1 β then the sites treated with manual and rotatory instruments after the surgery.

Periodontal disease and carotid atherosclerosis: Are hemodynamic forces a link?

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Aim. The link between periodontal disease and atherosclerosis has not yet been clarified, though systemic inflammation seems to be the common soil for both conditions. Inflammation influences also hemodynamic forces, that act as local risk factors for carotid plaques. It is not known if the link between periodontitis and carotid atherosclerosis is mediated, at least in part, by physical forces. Therefore, aim of the present study was to evaluate the association between carotid shear stress force and periodontal disease.

Methods. Thirty-three subjects underwent complete cardiovascular screening, carotid hemodynamic evaluation and dental inspection. Presence of classical risk factors for atherosclerosis, common carotid peak and mean wall shear stress values and periodontal indexes of disease (plaque index, gingival index and pocket deep) have been evaluated.

Results. Worse periodontal health was associated to the presence of carotid atherosclerosis. Patients with carotid plaques (n=19) had higher periodontal indexes compared with subjects without plaques (n=14) (gingival index: 1.40 ± 0.71 vs 0.69 ± 0.64 , $p=0.006$). These relations were independent of the presence of cardiovascular risk factors in multiple logistic regression analysis. In the 66 examined common carotids, wall shear stress was inversely related to all periodontal indexes ($r=0.54$, $p<0.00001$ for peak wall shear stress and gingival index). These relations remained significant also in multiple regression analysis, after correction for cardiovascular risk factors, gender and age.

Conclusions. The present study identifies for the first time a link between periodontal indexes and wall shear stress, suggesting that an alteration of hemodynamic profile might contribute to atherosclerosis in subjects with periodontal disease.

Periodontitis therapy using local oxygen

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Aim. To assess microbiological and clinical periodontal status of subjects with treated periodontal disease, besides the conventional method of mechanical root planning, with local oxygen therapy. This project had the support of the Autonomous Region of Sardinia.

Methods. A total of sixty-two patients underwent full periodontal examination. Patients with a diagnosis of medium-advanced periodontitis were divided randomly into two groups. Twenty subjects were enrolled in the case group and twenty-one subjects in the control group. The protocol provides causal periodontal treatment (scaling and root planing within 48h), furthermore local oxygen therapy in the case group (ten consecutive days), and reassessment 6-8 weeks and 6 months after root planing. In each examination samples of crevicular fluid were collected for the assessment of periodontal bacteria.

Results. In both study groups there has been a sharp reduction in the indices measured, with no statistically significant differences. In particular, case group shows a more marked improvement in both clinical and microbiological periodontal besides a self-perception of the status better than the control group.

Conclusions. The local oxygen therapy seems to be a cheap and fast treatment, which can integrate the traditional mechanical therapy. There is a need of a larger sample for a definite assessment.

Proteomic identification of periodontal pocket involved proteins: a pilot study

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Aim. Previous studies used indirect methods to analyze the pathogenesis of periodontal damage. In this case-control designed study we utilized the proteomic techniques to identify peptides related to periodontal pocket.

Methods. We studied 5 healthy patients suffering from advanced to moderate periodontitis showing at least one deep intrabony defect to be treated with periodontal resectory therapy. Pocket tissue and healthy proximal connective tissue (only when necessary to guarantee predictive outcomes) were harvested during surgery for pocket elimination. Total proteins, obtained from tissue sample lysates, were separated by two dimensional gel electrophoresis and identified by MALDI TOF/TOF mass spectrometer. Protein identification was performed using MASCOT search engine. In each of subject, only proteins identified in pathological tissues, not in healthy, were considered.

Results. Proteomic profiles from healthy and pocket tissues were obtained. Proteins associated with pocket tissue were identified by comparative analyses between the healthy and pathological tissues. Most of these proteins play a role in inflammatory process. In particular, S-100 protein complex represent the most significant spot.

Conclusions. Periodontitis is caused by the interaction between inflammation pathway and microbiota. S-100 complex plays an important role for resistance to invasion by pathogenic bacteria and fungi, in the development of endotoxic shock in response to bacterial lipopolysaccharide, regulates apoptosis and promotes phagocyte migration and infiltration of granulocytes. Proteomic appears to be a promising approach for the identification of periodontal pocket tissue related peptide/proteins.

Role of AQP1 as marker of the healthy status of tissues surrounding teeth and implants

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Aim. To evaluate, on a quality-quantity level, the presence of AQP1 (probably involved in the inflammatory process) in human gingiva of healthy/pathological/restored tooth or implant.

Methods. 18 patients split into 6 groups of 3 subjects each: (1) healthy periodontal gingiva (2) periodontitis tissue (3) periodontitis tissue after periodontal therapy (4) healthy peri-implant mucosa (5) peri-implantitis mucosa (6) peri-implantitis mucosa after CIST. Gingival biopsies (2mm x 2mm) from the attached tissue were obtained with scalpel after local anesthetic, fixed in formalin, embedded in paraffin and serially sectioned in 7 µm-thick sections, deparaffined, processed for AQP1 immunohistochemistry and, finally, counterstained with hematoxylin and observed by optical-microscope. AQP1 immunostaining was measured as integrated optical density (IOD) by 2 independent observers unaware of the group assignment. Statistics analysis: ANOVA, Bonferroni's, $p < 0,05$.

Results. IOD was $22,32 \pm 0,57$ in group(1), $33,09 \pm 0,51$ in group(2), $27,95 \pm 0,97$ in group(3), $30,7 \pm 0,71$ in group(4), $38,06 \pm 0,84$ in group(5) and $34,74 \pm 0,68$ in group(6). So AQP1's expression was significant higher in inflamed tissues and lower in healthy/restored tissues.

Conclusions. AQP1 is present in the lamina-propria around vessels and could be responsible for the inflammatory reaction of teeth and implants. It could be a useful prognostic biomarker for periodontitis and peri-implantitis in humans but we need a larger sample to confirm it.

Superficial modification of P(D,L) LA with plasma treatments: effects on osteoblasts

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Aim. In the present study we report the results of an experimental treatment based on plasma at atmospheric pressure on P(D,L)LA surfaces. In vitro experimental tests have evaluated proteic absorbance by bovin fetal serum, adhesion capacity and proliferation properties of osteoblasts on modified surfaces and bioactivity of a P(D,L)LA film functionalized with -COOH and NH₂. The aim was to verify the effect of plasma treatment at atmospheric pressure on biocompatibility of P(D,L)LA to favor adhesion and proliferation of osteoblasts.

Methods. PLA or polylactic acid is one of the most diffused biopolymers used in tissue engineering. Isoform P(D,L)LA is a polymer where 2 lactic acid isomers are casually distributed along the chain; therefore it does not structure in a crystalline and organized way. We used the plasma treatment at atmospheric pressure with a dielectric barrier discharge (APP-GDBD), endowed with a modular planar electrode. We used a carrier (He) able to introduce the precursor inside the plasma region, in order to obtain a thin layer of pdAA and an organic layer containing aminic properties.

Results and discussion. Our results showed that the increasing of cellular adhesion on the surface is strong enough to support cell growing. According to observation made on hydrophilic surfaces modified by plasma, precursor of osteoblasts MC-3T3 grow up faster than not treated P(D,L)LA. This new plasma treatment of P(D,L)LA at atmospheric pressure is able to improve biocompatibility and bioactivity of polymers toward osteoblasts and may become extremely useful in the field of tissue engineering of the bone, with both odontoiatric and orthopedic implications.

Surgical Debridement of Intraosseous Periodontal Defects

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Aim. The Single Flap Approach (SFA) is a minimally invasive procedure to access periodontal defects from either buccal or oral aspect only. To compare the outcome of surgical debridement in deep intraosseous defects accessed with either buccal SFA or the elevation of a flap at both buccal and oral aspects (double flap approach, DFA).

Methods. Fourteen defects were accessed with a buccal SFA, while 14 defects received DFA. Clinical parameters were assessed before surgery and 6 months after surgery.

Results. (i) both SFA and DFA resulted in a significant improvement of clinical attachment level (CAL) and probing pocket depth (PPD) (ii) SFA resulted in a greater PPD reduction compared to DFA, (iii) a similarly limited gingival recession (REC) increase occurred for both groups.

Conclusions. Both SFA and DFA result in substantial CAL gain and PPD reduction as well as limited postoperative REC increase. SFA seems to lead to a greater PPD reduction compared to DFA.

The Alkaline Phosphatase activity in gingival crevicular fluid before and after periodontal regenerative surgery

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Aim. The aim of the present study was to analyze the changes of the Alkaline Phosphatase (ALP) activity in gingival crevicular fluid (GCF) before and after periodontal regenerative surgery.

Methods. 10 patients, with a total number of 10 intrabony defects, were selected. All defects were treated by a regenerative technique by bovine bone and Platelet-Rich Fibrin (PRF) membrane. Pocket depth (PPD), attachment level (CAL) and gingival recession (REC) were recorded at baseline and after 6 months. Samples of GCF were taken at baseline and 1, 3 and 6 months after surgery, and ALP activity was evaluated.

Results. CAL and PPD were significantly reduced 6 months after surgery, with minimal or no REC increase. ALP activity decreased 1 month after surgery, then, it increased 3 months later and decreased again 6 months after surgery.

Discussion. ALP in GCF is considered as a marker of periodontal inflammation, but it is also associated with the formation and maturation of calcified tissues. Therefore, in this study, ALP activity decrease during the first month of periodontal healing may be considered as a consequence of the inflammation resolution due to the treatment. The subsequent ALP increase may reflect the hard tissues regeneration phase. Finally, the ALP decrease points out the conclusion of the tissue maturation.

Conclusions. We can conclude that ALP can be used as a marker of periodontal tissues maturation after periodontal surgery, as well as a periodontal inflammation marker.

The amelogenins in the treatment of periodontical vertical defects

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Aim. The aim of this study was to assess the stability at 6 years of the clinical results obtained by regenerative periodontal surgery in the treatment of intrabony defects.

Methods. Out of 44 defects, 27 were treated with only amelogenins and 17 with amelogenins and β -TCP. The clinical parameters considered were Δ PPD, Δ REC, CAL-gain, Vr-AG, X-ray angle defect, VPI and BOP of the concerned site.

Results and conclusions. Analysis of the results showed that the regenerative therapy with amelogenins is a reliable technique that can give effective results in terms of pocket depth reduction and gain of clinical attachment in both the short and long term. The best results were obtained in defects with an intrabony component > 3 mm and with an angle $< 35^\circ$. The use of the material in combination with amelogenins seems to be indicated in defects with an intrabony component of 3 mm and an angle $\geq 35^\circ$. The starting anatomical features of the defects appear to have a major role. Supportive care over time is fundamental to ensure the maintenance of short-term results.

The coronally advanced flap associated with a connective tissue graft for the treatment of multiple recession defects in mandibular posterior teeth

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Aim. Multiple coronally advanced flap has previously been documented as an effective therapy for gingival recession coverage in cases of multiple adjacent recession defects, obtaining stable long-term results at 5-years follow-up. The aim of this study is to further test this surgical technique, in association with a connective tissue graft, in a case series of mandibular posterior gingival recessions.

Methods. 20 patients presenting at least two adjacent gingival recessions in the posterior mandibular area were selected for the study. Periodontal parameters were recorded (REC, PPD, CAL and KT) on the teeth involved in the surgeries at baseline and at 1-year follow-up.

Results. A total of 53 recessions have been treated: no significant complication affected the surgeries, no patient abandoned the study. Recession depth was reduced from 3.55 ± 0.77 mm at baseline to 0.18 ± 0.29 mm at the 1-year control, while differences in pocket depth were not significant and keratinized tissue increased from 0.54 ± 0.45 mm to 3.16 ± 0.67 mm. Greater reductions in recession depth were observed in the cases with worse initial condition. An average of $94.19\pm 5.76\%$ of recession coverage was obtained.

Discussion. Multiple coronally advanced flap in association with connective tissue graft may be proposed as a valid therapeutic approach for multiple recession defects in mandibular premolar areas.

Treatment of gingival recessions: two case-reports

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Gingival recession is the movement of the marginal soft tissue, apical to the cemento-enamel junction, with exposure in the roots of the teeth. The etiology of recession includes predisposing and precipitating factors. In the present study, the authors treated two patients affected by class-I and class-II gingival recessions, according to Miller's classification: a 35-year-old male with a 5-mm vestibular recession of tooth 13 and a 30-year-old female with recession of teeth 14 and 15. They both presented with the typical symptoms of gingival recessions. After clinical-objective evaluation and periodontal x-ray examinations, periodontal surgery was chosen to correct the gingival defect. The technique adopted in the two cases, thanks to the presence of a sufficient quantity of attached gingiva in the areas surrounding the lesion, was the double papilla graft with guided regeneration. A full-thickness flap was raised, revealing the bone recession. After a thorough root planning, we performed guided regeneration with human demineralized freeze-dried bone graft imbued with antibiotic, which was inserted in small holes made to the surrounding bone to promote bone stimulation and bleeding. Finally, the flap was sutured after applying a resorbable membrane. Healing was followed-up at 3, 6 and 12 months, showing a predictable outcome of the suggested protocol.

Treatment of intrabony defects with enamel matrix derivative and autogenous bone. A cases series

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Aim. The aim of this study was to investigate the effectiveness of a new technique for the treatment of non-containing intrabony defects using enamel matrix protein derivative (EMD) in association with autogenous bone (AB), grafted by a piezo-electric device.

Methods. Fourteen consecutively treated patients were included. A total of 15 deep, one to two wall intraosseous defects, were selected. Probing pocket depth (PPD), clinical attachment level (CAL), gingival recession (REC) and periapical x-rays with a customized bite-block were recorded at baseline and 12 months after surgery. The defect was accessed with the Minimally Invasive Surgical Technique, and the root surface was scaled, planed and conditioned with EMD. Then AB graft, harvested from the retromolar mandibular area by means of piezosurgery, was positioned to fill the defect

Results. PPD amounted to $7,8 \pm 1,78$ mm before surgery, and decreased to $3,53 \pm 1,06$ mm at 1 year ($p < 0,0001$). CAL varied from $9,8 \pm 2,14$ mm pre-surgery to $5,67 \pm 1,72$ mm at 1 year ($p < 0,0001$), with CAL gain averaging $4,13 \pm 1,3$ mm. REC change was $0,13 \pm 0,92$ mm. CAL gain ≥ 3 mm was recorded in 14 patients.

Conclusions. The results of this study pointed out that autogenous bone, grafted with piezo-electric device, can be considered a good scaffold to fill intrabony defects following EMD application in non-containing defects. Soft tissue recession was minimal or absent in all cases. X-ray showed, after one year, a partial bone filling of the defects.

Valutazione clinica dell'effetto aggiuntivo del laser a diodi nel trattamento delle malattie parodontali

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Obiettivo. Lo scopo di questo lavoro è stato quello di esaminare sistematicamente le prove sull'efficacia della terapia laser in aggiunta alla terapia parodontale non chirurgica, in presenza di una malattia parodontale.

Metodi. Sono stati arruolati 20 pazienti affetti da parodontite generalizzata di grado moderato, formulata in seguito ad una visita parodontale, che non avevano ricevuto terapie parodontali negli ultimi 6 mesi. Sono stati rilevati i parametri biometrici parodontali. Si è proceduto con il seguente programma di terapia parodontale causale: Una prima seduta di ablazione del tartaro sopra-gengivale e istruzioni e motivazioni all'igiene orale; una o due sedute di scaling e root planing e trattamento delle tasche parodontali con Laser a Diodi. Durante ciascuna seduta si è rilevato l'indice di placca attraverso il Plaque Control Record di O'Leary. Al termine di ciascuna seduta l'operatore ha effettuato l'irrigazione subgengivale per 5 minuti consecutivi con clorexidina 0.12%. A distanza di 4 settimane, si è proceduto alla raccolta di tutti i parametri parodontali della prima visita.

Risultati. Tutti i parametri biometrici sono migliorati notevolmente in particolare il CAL ed il BOP. Si è osservata una maggior compliance del paziente.

Conclusioni. Il laser a diodi in aggiunta ai risultati che si ottengono con la terapia tradizionale offre prestazioni ottimali in ambito parodontale, garantendo efficacia a livello clinico ed un trattamento senza sanguinamento.

PRATICTIONER SECTION

Errors of indexing randomized clinical trials in dentistry

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Aim. The aim of this study is to evaluate the sensibility and the precision of PubMed (PM), Embase (EM) and Cochrane Library (CL) to recognize RCTs in dentistry. A further aim is to check if the formal characteristics (Title and Abstracts) and methodological characteristics (studies in-vitro) of the articles can have an impact on the results.

Methods. A handresearch on journals indexed in the ISI Web of Knowledge with Impact Factor 2008 (Subset Category: Dentistry, Oral Surgery & Medicine) were performed with the aim of finding all the RCT studies published in these journals during 2008. Then were performed researches on PM, EM and CL to check their sensibility and precision.

Results. The handsearch listed 428 RCTs. Of these Articles, PM and CL picked out 397 (sensibility 92.7%) and EM detected 349 (sensibility 81.5%). RCTs not mentioned in the Title or the Abstract showed a relative risk of not being identified of 9.22 for PM or CL and 3.05 for EM. The precision was 74.1% for PM or CL and 69.7% for EM. Of the articles erroneously considered RCTs, the 87,1% for PM or CL and 67.1% for EM were studies performed in-vitro.

Conclusions. Databases frequently detect and pick out these articles even though they often index as RCT studies which are in-vitro instead. The indication in the Title or Abstract of the method of study used should increase enormously the values of sensibility and precision of common database concerning dentistry articles.

Gingival hyperplasia or metastases

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²Azienda USL 7

Cancer is a complex disease in which many basic processes such as cell division, apoptosis and migration are linked to dysfunctions. Metastases are secondary manifestations of a primary cancerous lesion occurring in some cases in very distant regions of the body. Metastatic tumours of the oral cavity are uncommon and constitute about 1% of all oral neoplasias. They may occur in oral soft tissues and in the bones. Metastatic tumours to the oral region are not easy to diagnose because of their low frequency of occurrence. Therefore, they have to be taken into account in the differential diagnosis of inflammatory and reactive lesions to the oral cavity. The authors report 4 cases of metastatic lesions caused by esophageal, mammary and renal carcinoma.

Immediate implants. A novel surface results. Multicentric Randomized Controlled Clinical Study

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Aims. The aim of this study is to evaluate clinical success of a novel dental implant, immediately placed into infected sites.

Methods. In TEST group patients implants to be tested (Way) were placed. In CONTROL group patients were placed an already well tested type of implant (Kentron). All implants were immediately loaded with a not functional provisional screwed crown. Resonance frequency (ISQ), bone level measurement, and 3-point buccal probing was assessed at implant placement and 1, 6, 12 months after loading.

Results. After 1 month in both groups a lessening of ISQ mean values were found which were lower in Test group. At 6 months control ISQ values increased in both groups. Test group ISQ values still maintained higher. The first marked differentiation in bone levels was found after 6 months both mesial how distal. At 1 year control the differentiation between two groups was consolidated both in mesial bone levels how in distal bone levels. Differences in probing depth are not meaningful and globally indicate a reduction of probing depth average. After 1 year 1 implant was lost in Test group that brings to a success percentage of 95%. In the same period two implants were lost in Control group with a 90% success percentage. Overall success percentage after 12 months was 92,5%.

Conclusions. Within the limit of this study we can state that dental implants provided with micro-thread neck, switching platform and conical connection assure greater stability of bone levels. We can also affirm that implant provided with Syntegra® surface suffer for a lower lessening of post-placing stability. Such a phenomenon must be related to a faster de novo bone formation on the L.A.S.E.R. ablated titanium surface.

The deciduous tooth: a durable space maintainer. Two clinical cases

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Private practice in Verzino (KR)

Aim. Patients who are congenitally missing one tooth or more are frequently encountered in routine practice.

Methods. First case: 23 year old male, which refers to a disorder to chew tooth mobile. We observe the presence of 7.5 very mobile and the x-ray is absent 3.5 for agenesis. We program the extraction of 7.5 and maintenance space with a fixed device. Second case: child of 9 years. The observation is random during a routine dental visit. The x-ray is absent 4.1 for agenesis. We do not in any way; 8.1 remains as natural space maintainer. Clinical inspection every 2-3 months.

Results and conclusions. Congenitally missing teeth may cause serious emotional and physical problems particularly during adolescence. The first step in hypodontia management is to decide whether to apply space closure or space opening when making room for fixed restorations and implants.

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PROSTHETIC DENTISTRY

A 3D finite element study on biomechanical efficiency of All-on-Four in case of partial mandibular resection

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Aim. The aim of this study is to analyze stress distribution patterns on 3D FEM at bone, implant and framework level of two different designs for fixed implant-supported prostheses in completely edentulous patients, comparing the results obtained on whole and partially resected mandibles.

Methods. A TC scan of a totally edentulous mandible was used to create 3D anisotropic FEM of a whole and of a partially resected mandible. Two types of totally implant-supported rehabilitation were simulated, each with four implants: parallel and All-on-Four configured fixtures on whole mandible; parallel and All-on-Four configured fixtures on resected mandible. Stress distribution patterns and its maximum values were analyzed at bone, implant and superstructure level.

Results. Implant stresses are greater on the whole mandible. Framework and cancellous-bone stresses are comparable in each of the cases analyzed. On the resected mandible maximum stresses at the cortical-bone/implant interface are higher. The exact opposite applies in maximum stresses on external cortical bone.

Conclusions. On the resected mandible the All-on-four configuration proved biomechanically superior to that with parallel implants as regards radial stresses on implants and cortical bone. At the bone/implant interface, however, this heightened the maximum stress. On the whole mandible the All-on-four rehabilitation proved biomechanically superior to the parallel-implant one at all levels.

Advantages of a simplified edentulous treatment (SET) in transferring data to the prosthodontic laboratory

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The traditional protocol for the treatment of an edentulous patient consists of six clinical sessions. Between the latter, five support actions by the prosthodontic lab are necessary. The information given to the prosthodontist (edentulous crest morphology and their vertical and horizontal relations, occlusion plane orientation and esthetical parameters) go lost at the end of the treatment. The literature concerning data transmission to the prosthodontist for the correct implementation of the prosthesis has pointed out a frequent insufficiency. The consequent mistakes noticed when the prosthesis is finished cannot be found in any of the clinical steps since every support action given by the prosthodontist during the performance of the clinical steps has gone lost. The suggested SET method overcomes the above mentioned disadvantages though keeping intact all the clinically registered data that can be compared with the final prosthesis and then filed.

Case Report: fixed implant-supported prostheses for patients with resected mandible

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Aim. In clinical practice there are partially or wholly edentulous patients who have not undergone a surgical reconstruction in the wake of a mandibular resection. This is due either to an advanced age, to serious concomitant systemic pathologies, or to pronounced vascular problems. The role of osseo integrated implants in the rehabilitation of these patients is of vital importance, because these are a highly predictable means of providing sufficiently stable and retentive prostheses where a profoundly altered anatomy rarely permits adequate results through conventional prosthetic rehabilitation.

Methods. This report shows two totally edentulous resected mandibles rehabilitated with fixed implant supported prostheses. Even though there is the need of a large cantilever for an appropriate rehabilitation (an highly unfavorable biomechanical situation), the muscular condition and the situation of the opposing arch of these patients explain the absence of problems even after six years of follow up.

Case Report: prosthetic treatment of non syndromic aglossia

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Aim. Aglossia is a rare anomaly caused by failed embryogenesis of the lateral swelling and of the tuberculum impar from the fourth to the eight gestational week. Although a number of theories have been proposed, the etiology of aglossia is largely unknown. The aglossia may occur as an isolated disorder or in association with other congenital deformities, particularly limb defects, cleft palate, deafness and several diseases. Sequelae of aglossia involve several conditions that must be treated with the participation of professionals in the areas of nutrition, psychology, speech and hearing, general dentistry, orthodontics, maxillofacial surgery and implantology.

Methods. This report describes a case of aglossia and micrognathia at birth treated with orthodontic, surgical and prosthetic rehabilitation. The patient started the orthodontic treatment with a C-modeler for five years. She was surgically treated for micrognathia at 10 and at 13 years old. The first prosthetic treatment was at 14 years old, involving a partial denture with an artificial tongue. The orthodontic treatment finished when the patient was 20. When she was 22 the definitive prosthetic treatment started with a fixed full-arch denture on her four remaining natural teeth and on two implants. After two years those teeth were extracted because they developed caries under prosthetic crowns and other three dental implants were positioned to make up a new fixed full-arch prosthesis.

Clinical performance of three-unit zirconia-based FPDs: 6-year prospective clinical study

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Aim. This prospective clinical study aimed at assessing the clinical performance of tooth-supported 3-unit posterior zirconia FPDs after 6 years.

Methods. 37 patients received 48 3-unit posterior zirconia FPDs (Procera, NobelBiocare). Specific inclusion criteria were used. Standardized tooth preparations were realized with chamfer shoulder. Impressions were made with polyethers (3M ESPE). CAD-CAM cores were made and the FPDs were luted with resin cement (RelyXUnicem, 3M ESPE). The patients were recalled for a whole observational period of 6 years. Survival and success rates were evaluated using the USPHS criteria. The biologic outcomes were analyzed at abutment and contralateral teeth. Descriptive statistics were performed.

Results. - All FPDs completed the study, resulting in 100% cumulative survival rate and 93.75% cumulative success rate. No losses of retention were recorded. 41 restorations were rated Alpha in all measured parameters. Minor chipping of ceramics was detected in 3 restorations. No significant differences between the periodontal parameters of the test and control teeth were observed. As to esthetics, 43 restorations were rated Alpha and 5 were rated Bravo by both the clinicians and the patients either at baseline and 6-year follow-up.

Conclusions. - Six-year clinical results proved that 3-unit posterior zirconia-based FPDs were successful in the medium-term. This type of restoration may be considered reliable to replace a missing tooth.

Columbus bridge protocol full arch passive fit with luting technique

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Aims. This study aims to show the prosthetic luting technique as a good way to reach a clinically acceptable passive fit between the implant components and the metal framework of a full arch fixed bridge supported by implants as in the COLUMBUS BRIDGE PROTOCOL.

Methods. With the surgical placement of four immediate implants in a complete edentulous jaw after the extraction of all the compromised teeth, wanting to perform an immediate functional loading, there is the need to realise a full arch implant supported fixed bridge with some key features. The COLUMBUS BRIDGE wants to be supported by a rigid metal framework in order to splint the four implants to reduce the stress to the bone-implant interface, due to the occlusal forces applied few hours after the implant placement, to ensure complete implant osteointegration. The occlusal surface of the provisional bridge has to be made in acrylic material, to reduce the transmission of the occlusal forces to the implants. The provisional bridge 24 hours after the surgery has to be realised without distal cantilever, again to reduce the stress transmitted to the bone-implant interface. The most important feature of the metal framework to let all the environment work, together with the rigidity, is the passive fit on the four implants. To reach a "clinically accepted" passive fit, the COLUMBUS BRIDGE PROTOCOL uses the luting technique that cements the implant components to the metal framework of the bridge.

Conclusions. Within the limitations of a manual and visual test as the "Test of Sheffield", the stone impression and the luting technique seem to be two valuable ways to reach a "clinically acceptable" marginal fit between the metal framework and the implant components used in the COLUMBUS BRIDGE PROTOCOL.

Complete upper jaw edentulism: phonetic evaluation of various prosthetic rehabilitation

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Aim. To rehabilitate an edentulous patient, it is important knowing all the aspects of various types of prostheses. This study analyzed phonetic in patients wearing a complete upper prostheses or an implant fixed Toronto prostheses.

Methods. 40 patients divided in: group fPT (females complete upper prostheses), group fPFT (females implant fixed Toronto prostheses), group mPT (males complete upper prostheses) and group mPFT (males implant fixed Toronto prostheses). The phoneme /S/ was evaluated by acoustical records of the word "sasso" pronounced from patients. The records were acquired by a software and analyzed applying the Fast Fourier Power Spectrum: we observed energy level (dB) in function of frequency (Hz).

Results. Comparing all groups of this study, we could assert that between groups fPT and fPFT, fPT shew higher energy levels in intermediate and high frequencies range; between groups mPT and mPFT, mPT shew higher energy levels in low frequencies; between groups fPT and mPT, mPT shew higher energy levels in low and intermediate frequencies, and fPT shew higher energy level in high frequencies; between groups fPFT and mPFT, fPFT shew higher energy levels in low frequencies, and mPFT shew higher energy levels in intermediate and high frequencies.

Conclusions. The increasing of energy levels for different frequencies ranges represents phonetic alterations. Causes of these types of alterations are probably due to prostheses' and patient's characteristics.

Dental Implants supporting a bar-retained maxillary overdenture: a case report

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Several treatment options with implants have been described for maxillary edentulous patients. Implant - supported overdentures are a predictable treatment option and the placement of two separate bars may be indicated in Class III patients, to correct the discrepancy between lower and upper jaw.

Dentin exposure in tooth preparation for porcelain laminate veneers: a preliminary study

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Aim. The aim of the study was to assess the effectiveness of the tooth preparation controlled by means of a silicone template in producing an intraenamel preparation for porcelain veneers. Two null hypotheses were tested: there is no difference between operators with different skill in evaluating the dentin exposure; there is no difference between the window preparation and the butt joint preparation in dentin exposure.

Methods. For this in vitro study 20 intact maxillary central incisors were collected. A single expert operator prepared all the specimens for porcelain laminate veneers to a depth of 0.6 mm and a cervical chamfer line preparation of 0.3 mm, controlled by means of a silicone template. All of the prepared specimens were analysed and pictures were taken by means of a stereomicroscope at 16x magnification. Pictures were separately analysed by three operators with different skill (expert prosthodontist, postgraduated and undergraduated) and the percentage of dentine exposure was calculated using a digital software. The statistical analysis aimed at comparing the ability of the three operators was performed with the Univariate ANOVA; the two preparations data were analysed with the T-test for compared means.

Results. The results showed a moderate percentage of exposed dentin (30.73%); the mean percentage of exposed dentine for butt joint preparation was 30.99% and for window preparation was 30.48%. The T test demonstrated a significant difference between the ability of the three operators with different expertise, but no significant difference was found between the two preparations. The first null hypothesis was rejected ($P=0.0003$), the second one was accepted ($P=0.08$).

Conclusions. Within the limits of the research methodology, the standardized preparation by means of a silicone template showed that the commonly accepted depth of preparation of 0.6 mm leads to a great amount of dentine exposure. There was a significant difference between operators, whilst no difference was found for the two different preparation designs. Further in vivo investigations based on different research systems will be needed to confirm the results of this preliminary study.

Effect of fiber post length and bone level on the fracture resistance of endodontically treated teeth

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Aim. To evaluate the influence of different height of bone on the fracture resistance of endodontically treated mandibular premolars restored with fiber post of two different length.

Methods. 20 mandibular single rooted premolars were: a) endodontically treated; b) cut 2mm coronally the cement enamel junction (CEJ); c) randomly divided into 4 groups: two different post insertion depth (5 and 7 mm) and two alveolar bone level from the CEJ (2 and 5 mm). Roots were prepared to receive the posts. A self-adhesive resin cement (RelyX Unicem Aplicap, 3M ESPE) was applied into the root canal, the glass fiber posts (RelyX Fiber Post, 3M ESPE) was seated and the resin cement was light-cured. The core was built-up with microhybrid resin composite (Universal Restorative Filtek SupremeXT, 3M ESPE). Each tooth was a) embedded in a block of self-curing acrylic resin up to 2 and 5 mm below the CEJ, b) prepared with a circumferential 0.5mm chamfer at the CEJ level, and c) scanned to realize the laser-sintering metal coping (cobalt chrome alloy). Each coping was tried on the tooth and luted with RelyX Unicem. Each specimen was perpendicularly loaded until fracture using a universal loading machine (1mm/min).

Results. No significant differences were found between groups (ANOVA) in terms of fracture loads.

Conclusions. Within the limits of this in vitro study, the length of fiber posts and the height of bone have no influence on the fracture load of mandibular premolars.

FACETS: case report

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Aim. Facets are the strong point of esthetic, less-invasive dentistry. They are extremely-thin prosthetic manufactures, such as Lumineers, which can be around 0,1 - 0,3mm thick and sacrifice little tissue of affected teeth. Therefore, they can soon solve those problems caused by dyschromia, fractures or bruxism.

Methods. For a long-term success, it is important to evaluate occlusal parameters, centric relation and protrusive function, in order to avoid tensile stress to the restoration. An alginate impression is taken. Then, our technician prepares a mock-up, which is a diagnostic model used to decide the shape, length and color of restorations. After mock-up evaluation, the temporary implant in acrylic resin can be placed. Subsequently, the elements are prepared, subject to intrasulcular insertion of a retractor wire with cylindrical domed diamond burs, changing over from a coarse to a fine grain. Interproximal spaces are opened through abrasive strips, to achieve proper contact areas. A biphasic secondary impression is taken through low-viscosity materials injected into the models and medium-viscosity materials injected into the trays. The temporary implant is lowered and cemented, and then followed-up one week later to verify its color and esthetic appearance. Before the final cut, we test the cement color through try-in pastes. Finally, the cement in excess is removed and the margins are polished by means of small rubber tools.

Case report. The clinical case is a 30-year-old female patient with dyschromia of restored teeth #11 and #21, which were treated 15 years earlier, and a 40-year-old female patient with excessive wear caused by bruxism of teeth #11 and #21.

Fixed prosthetic rehabilitation after dento-alveolar trauma

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Aim. This study compared different prosthetic rehabilitation techniques, subsequent to traumatic events in pre-adolescent patients with avulsed maxillary central incisor.

Methods. Some clinical cases were treated with late replantation Technique, followed by extraction of the tooth after 8-9 years from the trauma and use of GBR regenerative technique to obtain an adequate bone volume to support the implant insertion. In other clinical cases was not possible performed a replantation of the tooth and at the time of fixture insertion a bone Ridge Expansion technique was performed. In all these cases it was necessary a preventive fixed orthodontic treatment of the dental arches.

Discussion and conclusions. Since prosthetic implant rehabilitation in the anterior region is always a complex treatment owing to high aesthetic expectations, from the initial stages of treatment it is essential a close cooperation between pedodontist, orthodontist, prosthodontist and surgeon dentistry to ensure a biological functional and aesthetic result.

Fracture resistance of crownless teeth restored with non-circular section fiber posts

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Aim. Root canals frequently have non-circular or elliptic cross sections rather than circular. In order to improve the restoration reliability, the whole canal space should be filled by the post, leaving the minimum cement thickness. The aim of this study was to assess and compare the fracture resistance of teeth restored with fiber post and crown when subjected to a non-axial static load.

Methods. Posts having a non-circular section were compared to conventional circular section post. The diameter of circular posts was similar to the minimum diameter of non-circular ones. Sixty endodontically treated human teeth were randomly assigned to 4 groups of 15 teeth, restored with the following fiber posts: 1) Polygon HiRem # 2 (non-circular) and 2) Prosthetic HiRem # 1 (Overfibers, Italy); 3) Ellipson Light Post (non circular) and 4) DT Light Post # 0.5 (RTD, France). The crowns were removed and the root canals were shaped using an ultrasonic diamond tip designed for Ellipson posts to a length of 10mm. Only in Polygon group of was necessary to adjust the channel shape using the specific drills. The posts were cemented using X Core Flow (Dentsply), SCA and XP Bond adhesive (Dentsply). Subsequently, the teeth were placed in acrylic resin cylinders leaving 3mm of dental tissue outside of the resin. The outer portion of the post was standardized to a 5mm length. The posts were coaxial to the cylinder axis. Using transparent copings and CoreX Flow the cores were built providing a ferrule effect of 1.5 mm. Then, CoCr crowns were made using the lost wax technique. The metal crowns were cemented on the abutment teeth with GC Fuji Plus under a constant load of 5 kg. The samples were water stored at 37° C for 2 weeks. After that, the specimens were mounted on a 45° angle bracket and non-axially loaded using an Instron machine. Both early and ultimate fracture forces were recorded.

Results. Specimens restored with Polygon and Ellipson posts showed lower failure forces ($256.5 \pm 51\text{N}$ and $276 \pm 53.16\text{N}$, respectively) than teeth restored with circular posts (DT Light Post: $341.26 \pm 51.8\text{ N}$, Prosthetic Over Post: $348.88 \pm 60.7\text{ N}$, $p = 0.000$). Failures of non-circular posts mainly occurred by root fracture, whereas circular posts showed a higher number of early failures, although not catastrophic, prior ultimate fracture of the post restoration occurred.

Discussion. Using non-circular posts, the higher stiffness (due to the larger cross section), increases the risk of root fracture at maximum load levels, but reduce the micromovements responsible of subclinical interface failures, increasing the expected survival rate of the restoration. Actually, microleakage after failure of the adhesive interfaces could be due to the excessive strain allowed by the lower stiffness of the thinner conventional posts.

Conclusions. The non-circular posts lead to an increased risk of root fracture when heavily stressed, however, data suggest that the tooth/post/crown restoration is more stiff and stable within the range of the functional masticatory forces. The stiffer non-circular posts seem to reduce the stresses at the restoration interfaces when compared to standard circular posts.

IDS and surface treatment before final impression: a clinical protocol

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Aim. Tooth preparation for indirect bonded restorations usually generates significant dentin exposure. Delayed vs immediate application of bonding agents (IDS) respectively does not provide optimal conditions for long lasting performance of restorations. Aim of this study is to evaluate the behavior of two impression materials (silicone and polyether) over IDS tooth surface combined to different treatments.

Methods. 18 extracted teeth were used. After removal of occlusal half of the crown, the specimens were treated with Optibond FL (Kerr), and assessed following 1 of 3 treatments: air blocking (group 1) (n=6); air blocking+ prophy Z paste (group 2) (n=6); air blocking+ prophy Z paste+ Marsiglia soap solution (group 3) (n=6). Each group received either impression materials at the same time. The specimens were analyzed under SEM and measured.

Results. The areas of silicone and polyether linked on the surface in the group 1 were respectively $38,000 \pm 9,242$ mm² and $39,700 \pm 10,336$ mm² (n=3), while in the group 2 were respectively $0,267 \pm 0,252$ mm² and $0,467 \pm 0,252$ mm² (n=3), and finally in the group 3 were 0,00 mm² (n=3) for both. Statistical evaluations showed that there were significantly differences (P<.05) between group 1 and group 3.

Conclusions. the application of prophy Z paste and Marsiglia soap represents the best way to overcome the interaction between impression materials and IDS tooth surface.

Immediate loading and bone regeneration, a new prosthetic chance?

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Aim. Long date edentulism and cronical perio inflammatory process cause great bone resorption, that needs long implantoproshetic rehabilitation period, particulary if associated with bone regeneration procedures. We describe a new surgical technique, based on electrowelding framework on transictional fixture, that allows immediate loading prosthetic rehabilitation, in insufficient bone volume cases.

Methods. A 54 years old no smoking patient with non contributory medical history, showing upper jaw bone resorption, was treated with inserption of 6 bifasic implants and orizzontal and vertical regeneration. During healing period we took advantage from 4 transictional implants splinted with electrowelding bar supporting immediate temporary resin prosthesis. Transictional structures were removed after integration of 6 primary fixtures.

Results. The case had a good outcome with no failed implants and positive 3 years follow-up.

Conclusions. The use of this methodic gives us a lot of advantages compared to traditional thecnique: good hygiene maintenance -total absence of trauma on regenerated tissues and osseointegrating implants good comfort in prefinalization period.

Implant inclination and wear of overdenture attachments

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Aim. In exclusively retentive types of implant-supported overdentures with ball attachments the male part is screwed directly onto the fixture and the female part is encased in the resin of the prosthetic plaque. Placement of the implants in the interforaminal area must take into account the often compromised morphology of edentulous mandibles; accordingly, the aim of this study is to test the effect of implant inclination on prosthesis retention.

Methods. This study employed fatigue testing of spherical titanium attachments for overdentures to analyse the behavior of two types of matrix – one in teflon, supported by a specifically designed steel container, and one in gold alloy – whose caps were positioned at different angles with respect to the axis of the implant: 0°, 5°, 10° and 15°.

Results and conclusions. The retention values obtained with the two different types of sockets after 5,500 cycles of insertion and removal (corresponding to 3 real-life years) were compared. Teflon matrices proved to be preferable to gold ones, also because of the practical difficulties of correctly mounting the latter in the prosthetic plaque.

In Vitro Evaluation of Residual Dentin Thickness in Relation to Reduction for Prosthetic Zirconia Crowns in Endodontically Treated Teeth Restored with Glass Fiber Posts.

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Aim. The amount of remaining dentin thickness after tooth preparation has to be taken into account, not only because of its relationship to pulp vitality, but also for the abutment resistance and retention. The aim of this in vitro study is to investigate the amount of remaining dentin thickness after abutment preparation for zirconia-ceramic crowns, evaluating possible differences between endodontically treated restored with glass fiber posts and sound teeth.

Methods. 30 maxillary premolars were selected and randomly divided into 6 groups: 1) intact tooth; 2) tooth with 4 residual walls (RWs); 3) tooth with 3 RWs; 4) tooth with 2 RWs; 5) tooth with 1 RW; 6) tooth without residual walls. Groups 2, 3, 4, 5 and 6 had been endodontically treated previously. For each tooth a template was realized to check the amount of hard tissues removed. The endodontically treated teeth were restored by using glass fiber post and resin composite core restoration.

Results. For proximal walls the average dentin thickness is 1.04 mm; for buccal and palatal walls the average dentin thickness is 1.84 mm. For proximal walls mean values spread from 0.4 mm to 1.67 mm; for buccal and palatal walls mean values spread from 1.45 mm to 2.51 mm.

Conclusions. The amount of dentin removed by the endodontic access procedures determine a wide loss of dentin in proximal walls, and consequently attention must be paid during endodontic access. The zirconia-ceramic crown preparation guarantees a consistent amount of residual dentin thickness in all the groups.

Integral ceramics: a case report

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Aim. The continuous research for a good aesthetic, biological and functional integration of dental restorations has produced satisfying results in the field of ceramics. This material, without metallic structure, can transmit the light very similarly to natural teeth. The general term “integral ceramics” refers to a wide variety of materials, which differ in production techniques and in their chemical physical properties. CAD/CAM-assisted design and manufacturing, a widely-used technique, use silicate and oxide ceramics, while veneers and facets are based on leucite glass ceramics, which have low strength. Middle-strength lithium silicate ceramics are used for single crowns or small bridges. High-strength ceramics are yttrium-stabilized zirconia dioxide, which has an extreme final hardness and cannot be milled with cad-cam. Instead, it is worked in its green state and then sintered at 1500°C.

Case report. The clinical case is a 35 year-old woman who refused implantology and opted for an integral ceramic bridge. She was without tooth #46 and with destructive caries of tooth #47, after undergoing root canal therapy and insertion of gold-plated dental pins.

Management of Bronj: ozone, platelet gel and fibrin glue as elements for improvement of the international protocol' treatments. Our experience

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Aim. To evaluate the influence of different surface treatments on the microtensile bond strength of zirconia ceramic to resin cement.

Methods. Fifteen cylinder shaped (\varnothing 12X5.25 mm high) of zirconia sintered CAD/CAM blocks (IPS e.max ZirCAD, Ivoclar Vivadent) were randomly divided into 5 groups (n=3), based on the surface treatment to be performed: 1. Airborne particle abrasion with 125 μ m Al₂O₃ particles (S); 2 and 3. Experimental hot etching solution applied respectively for 30 and 60 min (ST30 and ST60); 4. Selective infiltration etching (SIE); 5. No treatment (C). Paradigm MZ100 blocks (3M ESPE) were cut into fifteen cylinders of 4 mm in thickness. Zirconia specimens of each group received the application of Metal/Zirconia Primer. Conditioned Zirconia and composite cylinders were luted using a resin cement Multilink Automix, in combination with the proprietary adhesive system. After 24 h bonded specimens were cut into microtensile sticks and loaded in tension until failure. Data were analyzed with two-way ANOVA and Tukey test ($p < 0.05$). Failure mode distribution was recorded and the interfacial morphology of debonded specimens was analyzed using SEM.

Results. Sandblasting in combination with metal primer obtained the highest bond strength values. SIE and ST60 treatments improved significantly the bond strength values comparing to Zirconia untreated (C) ($p < 0.05$). ST30 treatment did not increase bond strength results ($p > 0.05$).

Conclusions. Conditioning procedures on Zirconia based ceramic improved bond strength values. Sandblasting achieved the highest bond strength.

Oncologic maxillo-facial surgery resulting in severe tissutal defects: a technique for the prosthetic rehabilitation

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Aim. The morphological and functional rehabilitation of patients who underwent oncologic maxillo-facial surgery, involves the preparation of three-component maxillo-facial prosthesis, substituting soft and hard tissues. Aim of the study Making use of this kind of prosthesis made it possible to obtain an increase in function, phonetics, aesthetics and swallow, in patients where post-surgical anatomy resulted to be largely altered.

Methods. Since 1994, 225 patients have been treated (with 863 prosthesis), after they had undergone maxilla-facial surgery. Four kind of prosthetic rehabilitation have been used: immediate, pre chemo/radiotherapy, post chemo/radiotherapy, definitive. In those case necessitating it, a filling in PVS silicon was performed in order to substitute the soft tissues; the alveolar ridge component, made of acethalic resin, was connected to the PVS filler through a metallic ring (except for the pre chemo/radiotherapy prosthesis) and the denture was made of acrylic resin.

Results and conclusion. Patients treated with this kind of prosthesis, most of all if a PVS filler was needed, showed a higher rate of satisfaction as regards stability, phonetics, aesthetics, function and precision of the prosthetic rehabilitation, if compared to the traditional technique. The immediate prosthetic supply has improved the living condition of those patients, preventing mucous secretions to invade the oral cavity.

Phonetic analysis and anterior teeth position: a pilot study on preliminary outcomes

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Aim. to evaluate the effect of different maxillary central incisor positions on the /s/ speech sound in patients wearing maxillary complete dentures.

Methods. The maxillary dentures of six subjects were duplicated. A silicon key was used to fix the central incisors position to enable the anterior teeth to be moved palatally or closer to the crest of the alveolar ridge. Subjects were invited to pronounce the Italian word "sasso" for eight times with each prostheses. Data were analyzed using "Multi-speech" software. The /s/ speech sound was measured and the fundamental frequency (F0), energy spectrum and Fast Fourier Transformation (FFT) determined. Records were statistically analyzed with the Kolmogorov-Smirnoff and Paired t tests ($p < 0,05$).

Results. no statistically significant differences in terms of /s/ speech sound in patients wearing suitable or modified complete dentures as determined by the "Multi Speech" software ($p > 0,05$). Differences were found between male and female in terms of fundamental frequency ($p < 0,05$). Acoustically, when central incisors were positioned in a more palatal or lingual position, a "whistled" effect was assessed in all subjects.

Conclusions. within the limitation of this pilot study, central incisors position is an important factor in determining phonetics. In the case of a more palatal teeth position acoustic changes may be observed, which result in patient's stress load over time.

Prosthetic rehabilitation after late replantation in childhood and adolescence: a case report

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Aim. Dental injuries are a common occurrence in childhood, constituting a dental public health concern. This paper documents the late replantation of an avulsed permanent tooth in a 8 year-old boy and subsequent evolution of treatment.

Methods. A 8 year-old boy presented to our clinic after have suffered a Dental trauma while playing at school. The result of the trauma was avulsion of the maxillary permanent central incisor. After routine verifying there was no local or general complications, the late replantation Technique of the avulsed tooth was performed. Eight years later it was decided to extract the replanted tooth, but because the patient presented malocclusion, a fixed orthodontic treatment was carried out. It was decided to perform a GBR regenerative techniques of the bone defect when the boy was 16 year-old. The case was completed with replacement of the affected tooth by an endosseous implant.

Results and conclusions. The differential gradient between chronological and bone age may be relevant and allow the placement of the implant without the risk of incurring in infraposition, functional and aesthetic problems, before the active growth phase ends.

Prosthetic rehabilitations in oncologic patients

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One of the most frequent causes of oronasal or oroantral connection are tumor which require either partial or total surgical removal of the palate. The following intraoral defects can have a devastating effect on a patient's aesthetics and function: especially their chewing and feeding difficulties provoke a growing thin. We can help them with a prosthetic device, called obturator. Obturators allow patients to eat and drink without fear of food or drink entering the oronasal or oroantral cavities during mastication. We report two cases treated with obturators. The first patient is a 52 years-old man, he came to our attention when the tumor, squamous-cell carcinoma, had already reached the left orbital base giving a light swelling. The surgeon exeresized only one maxilla leaving part of the right half of palate. Therefore we planned a plate-obturator with retaintions on the remaining teeth and palate. The other patient is a 40 years-old woman, an epidermal carcinoma involved a huge area of the palate. We chose a flange obturator because the exerisis was too width and only basal bone was left. A well planned obturator, that fits good to soft and hard tissues, improves quality of life and it is an important phase in general rehabilitation of oncologic patient.

Protocols of removable prosthetic rehabilitation of the patients taking intravenous biphosphonates

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Intravenous biphosphonates are widely administered in various pathologies characterized by metabolic imbalance, increased by bony reabsorption and weakening. In particular, zoledronic and pamidronic acid have an attested efficacy in the management of hypercalcemia and in the treatment of symptomatic bony damages related to multiple myeloma, mammary carcinoma and other tumors. The most feared complication is the BRONJ; however, tooth extraction, implant surgery and surgical interventions involving alveolar bone are the first motivating factors, with an incidence from 0,8 % to 12%. The aim of our study is to evaluate the safety of the protocol used to manage the patients undergoing intravenous biphosphonates therapy, and to establish the percentage of occurrence of BRONJ during the removable prosthetic rehabilitation and at the end of the rehabilitation. Twenty patients attending the department of Oral Rehabilitation follow a precise program, which consists of a visit with radiographic exams and specialistic exams before beginning the therapy with biphosphonates, a clearing up of all the non-treatable teeth, the prosthetic rehabilitation, and successively every patient enters a follow-up program with a tight schedule. According to the results emerging from a six-months follow-up, beyond the common signs and symptoms due to the prosthetic incorporation, only one case of complication occurred, after the extraction of a pilaster tooth of a partial removable prosthesis.

Screw-retained implant-supported zirconia crowns: 12months study

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The aim of this study was to evaluate the clinical performance of screwed customized zirconia abutments. Additionally, the marginal fit between the selected implant components was measured and the clinical gingival response was monitored. Twenty patients were consecutively selected for a prospective study of 30 implant-supported restorations. Customized zirconia abutment complexes were prepared, then ceramic was performed directly. The abutments were screwed on to the implants and restored with all-ceramic crowns. Plaque and gingival indices were recorded at monthly intervals over a 12- month period. All ceramic zirconia abutments offered sufficient stability to support implant-supported single-tooth reconstructions in anterior and premolar regions. The soft and hard tissue reaction toward zirconia was favorable.

The One Model Technique

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For a long time the only therapeutic option for edentulous patients has been a removable complete denture. In the 1960's the osseointegration radically opened new perspectives. Branemark's protocol described submerging the implants and keeping them free of load during the osseointegration period to avoid a fibrous repair. The healing process was accomplished in 6 months at the mandible, 3 to 4 months in the maxilla. However these guidelines did not avoid the use of a complete denture, as a transitional phase, with numerous relining, before the load of the implants. Immediate loading at the mandible (Schnitman, Testori) and at the maxilla (Misch) has been shown to be a reliable method to provide an immediate fixed solution to the edentulous patient. The difficulty of any immediate loading protocol is to anticipate the surgery to provide an esthetic and functional temporary to the patient. Various techniques have been described to answer this problem, including converting the existing prosthesis, relining a prefabricated provisional or using advanced imaging techniques to virtually plan the implant position. The aim of this poster is to describe a prosthetic procedure defined as "One Model Technique" for immediate implant loading in edentulous or potentially edentulous patients.

RESTORATIVE DENTISTRY

A conservative treatment for amelogenesis imperfecta with direct resin composite restorations: a case report

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Aim. Rehabilitation of a patient with amelogenesis imperfecta (AI) from both the functional and aesthetic standpoints represents a challenge. The complexity of the condition requires an interdisciplinary approach for optimal treatment outcomes.

Methods. This case report describes an approach for the treatment of a 10-year-old female patient in mixed dentition with hypoplastic AI associated with reduced occlusal vertical dimension, dentin hypersensitivity and generalized aggressive periodontitis. The patient was treated with direct resin composite restorations (Filtek Supreme Flowable XT - Filtek Supreme XT, 3M ESPE; IntenS, Ivoclar-Vivadent; Enamel Plus HRI, Micerium) combined with a mild two-step self-etch adhesive (Clearfil SE Bond, Kuraray).

Results. follow-up visits were scheduled at different intervals. Improvements in aesthetic and function were significant and remained stable at 12 months. No adverse effects were observed. Protection against further wear, sensitivity, and plaque accumulation, while significantly enhancing the patient's aesthetic appearance, made this case a success.

Conclusions. due to the patient's young age, any invasive prosthetic approach was delayed in favour of direct restorations, which represented a more rapid, conservative therapeutic choice giving suitable aesthetics.

A new flowable resin-based composite clinical performance in Class II cavities: a split-mouth study

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Aim. To evaluate the clinical performance of a new resin composite in Class II cavities over a period of 6 months with a randomized split-mouth study design.

Methods. 12 healthy subject were treated for composite restoration in molars: 12 cavities were treated with a new flowable resin-based composite (test group- G1) following manufacturer instruction (until 4 mm that reach proximal contact area and above traditional composite) and 12 with traditional universal microfilled composite.(control group- G2). The proximal box was always maintained in enamel in all the cases. The restorations were examined as carrying-out time and according to modified US public health service (USPHS) criteria (qualitative index matching from A to D) at 1 month(T0) and at 6 months (T1) after therapy.

Results. We observed a 100% survival of all the restorations at 6 months, the average carrying-out in G1 permitting to save much time against G2. All the USPHS criteria resulted clinically acceptable both in G1 and G 2. In particular, the filling integrity index was 100% A in G1 and 91.7% A, 8.3% B in G2, the proximal contact point index resulted 66.7% A, 33.3% B in G1 and 83.4% A, 16.6% B in G2, secondary caries index was 100% A in G1 and G2, retention index was 100% A in G1 and G2, sensitivity index resulted 91.7% A and 8.3% B in G1 and 91,7% A, 8.3% B in G2, and soft tissue health index was 91.7% A, 8.3% B in G1 and 91.7% A, 8.3% B G2.

Conclusions. the new flowable resin-based composite technique guaranteed good clinical outcomes, in accordance with the American Dental Association Acceptance Program Guidelines. it is more handy in deep, irregular cavities with difficult access. Within the limitations of the current study, it also represented a promising innovation in conservative needing of further studies.

Aluminum oxide paste polishing: rugosimetric evaluation of four flowable composite resins

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Aim. Simplified efficient polishing techniques are requested by clinicians. The present study evaluates the surface roughness of 4 flowable composites polished with a recently introduced one step aluminum oxide paste.

Methods. Twenty discs per composite were polymerized under a mylar strip: G1, Filtek Supreme XT flow (3M ESPE, USA); G2, Dyract flow (Dentsply Caulk Mildford, USA); G3, Tetric flow (Ivoclar, Germany); G4, Premise flow (Kerr, USA). Ten discs per group were finished with 1200 grit sandpaper and polished with Nupro Shimmer paste (Dentsply Caulk Mildford, USA). Specimens were stored in artificial saliva for 24h and then underwent a profilometric analysis. Collected data were statistically analyzed with parametric tests ($p < 0.05$).

Results. Ra mean values \pm SD (μm) of polished specimens were: G1, 0.07 ± 0.01 ; G2, 0.08 ± 0.02 ; G3, 0.05 ± 0.01 ; G4, 0.04 ± 0.01 . Mean roughness was significantly lower in mylar than in polished specimens in G1 and G3, whereas greater in G2; mylar and polished specimens showed similar surface roughness in G4. No statistically significant difference was found between G1 vs G2 and G3 vs G4, respectively.

Conclusions. Flowable composite polishing with Nupro Shimmer lead to roughness mean values lower than the threshold ($0.20 \mu\text{m}$) in all groups. Best results were achieved with Tetric and Premise flowable composites.

Clinical evaluation of a new micro-hybrid composite material for direct restoration of posterior sectors

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Aim. The aim of this work is the clinical evaluation of a new composite material, specifically designed for direct restorations of posterior sectors of the oral cavity (Estelite Sigma Quick Posterior® - Tokuyama Dental). This material has excellent mechanical, physical properties and introduces important innovations, such as RAP technology (Radical Amplified Photopolymerization Technology), allowing for a rapid material polymerization (the polymerization time is about one-third shorter than other composite resins) and a good stability to light. Another advantage is the presence of hybrid fillers, constituted by 0.2 µm spherical particles obtained by sol-gel process (ensuring excellent material moldability and polishing) and 3 µm irregular particles obtained by smash process, which implement the mechanical characteristics.

Methods. our clinical experimentation was based on 10 direct restorations of posterior sectors in Black's class I and II cavities, using the above-mentioned material. We evaluated the clinical characteristics of the material and patient feedback both at time zero (immediately after restoration) and at time one, that is to say six months after restoration. The criteria we used are based on the modified United States Public Health Service (USPHS) criteria, which constitute a system of clinical evaluation suggesting an anamnestic, visual and instrumental (bodkin) analysis, in order to evaluate: color harmony; integrity of restoration; marginal integrity; anatomical form of the marginal ridge; anatomical form of the whole surface; margin discoloration; abrasion; postoperative sensitivity; patient satisfaction. Each of these criteria was rated, allowing for a global evaluation of the characteristics of the material.

Results. Both at time 0 and time 1, Estelite Posterior produced excellent results for all the examined criteria, with a few infrequent exceptions, confirming the properties advertised by the manufacturer, from both a mechanical and clinical perspective. Therefore, this material can be included in the category of the best commercially available composite materials for restorations of posterior sectors.

Direct composite reconstruction of fractured teeth: case report

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Fracture of the anterior teeth by trauma is the most frequent type of injury in the permanent dentition, especially among children from 9 to 11 years old: the most affected teeth are maxillary incisors due to their anterior position and protrusion caused by the eruptive process. Several factors influence the management of coronal tooth fractures, including extent of fracture (biological width violation, endodontic involvement, alveolar bone fracture), pattern of fracture and restorability of fractured tooth (associated root fracture), secondary trauma injuries (soft tissue status), fractured tooth fragment, occlusion and esthetics. One of the options for managing coronal tooth fractures when the tooth fragment is available and there is no or minimal violation of the biological width is the reattachment of the dental fragment. If the lost fragment is not recovered, or it is inadequate for repositioning, it would be advisable to use another technique: direct resin composite restorations or an indirect manufactures. In this work, a methodical protocol for the restoration of a fractured anterior tooth of a child is presented: diagnostic waxing and silicone matrix formed the basis for successful reconstruction of the fractured anterior tooth with composite resin. After finishing and polishing, an esthetic and natural-looking restoration was achieved, which completely satisfied the functional and esthetic expectation of the patient and dental team.

Effect of two 10% carbamide peroxide bleaching agents: an in vivo study

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Aim. Dentin hypersensitivity is a common side effect of tooth whitening and enamel alterations might occur. To counteract these drawbacks, remineralizing and desensitizing agents are frequently added to products. To compare a 10% carbamide-peroxide (CP) gel containing potassium nitrate and fluoride with a 10% CP bleaching gel without desensitizing agents. Tooth colour, hypersensitivity, and enamel morphology were evaluated. The tested hypothesis was that the 2 products would have the same effect.

Methods. 20 subjects were selected. The tested materials were two 10% CP bleaching gels with or without potassium nitrate and fluoride (Opalescence PF, Ultradent Products Inc.; Vivastyle 10%, Ivoclar Vivadent, respectively), applied in accordance with manufacturers instructions for 2 weeks. Spectrophotometric color evaluation and sensitivity assessment were performed before and after treatment, and high precision impressions of the upper right incisor were taken. Epoxy resin replicas were poured and analyzed with SEM. All data were statistically analyzed using ANOVA for repeated measures.

Results. The spectrophotometric evaluation revealed that both products were effective as bleaching agents. A moderate hypersensitivity increase was recorded, with no difference between the 2 groups. The SEM analysis showed the absence of relevant enamel alterations.

Conclusions. This in vivo study showed that the two bleaching agents were both effective with moderate side effects.

Influence of different adhesive systems on deep cavities outcome

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Aim. La detersione della lesione cariosa rappresenta uno step fondamentale nell'ambito dei restauri adesivi in resina composita. La rimozione dello smear layer creatosi durante le manovre di preparazione cavitaria e l'impiego di sistemi adesivi total-etch è stata per anni considerata la procedura clinica più affidabile per quel che riguarda i restauri adesivi. Tuttavia, data l'anatomia tubulare che si trova in prossimità della camera pulpare, alcuni clinici ultimamente preferiscono l'impiego di adesivi self-etch per il restauro di cavità profonde al fine di ridurre la sensibilità post operatoria. Lo scopo di questo studio clinico randomizzato è valutare l'influenza del sistema adesivo sulla sensibilità post-operatoria e sul mantenimento della vitalità pulpare nel restauro di cavità profonde.

Metodi. Per questo studio sono stati arruolati 80 pazienti afferenti al Reparto di Conservativa della Dental School Lingotto per il trattamento di lesioni cariose. Sono stati esclusi pazienti con problemi di salute generale e che non dimostrassero un'adeguata igiene orale. Sono stati esclusi gli elementi dentari già otturati in precedenza, denti con fratture o crack smalto dentinali, denti parodontalmente compromessi (più di 4 mm di sondaggio), denti non vitali, denti pilastro di protesi fissa o removibile, denti sottoposti a chirurgia parodontale da meno di 3 mesi, denti sottoposti a trazione ortodontica recente, dente non in normo-occlusione, paziente bruxista, gravidanza, allergia a componenti del materiale di otturazione, pazienti con alterazione della sensibilità, pazienti con meno di 20 anni. Rientrano nello studio i denti con lesione cariosa primaria distante in radiografia dalla camera pulpare meno di 1 mm. I pazienti sono stati suddivisi in 2 gruppi in base alla procedura adesiva utilizzata, total-etch 3 passaggi (Optibond FL Kerr) o self-etch 2 passaggi (Adper SE Plus 3M ESPE) con premordenzatura dello smalto per 15 secondi. Il restauro adesivo è poi stato effettuato con composito flow (Venus Flow) e composito nanoibrido (Venus Diamond). Ai pazienti è stato consegnato un foglio che prevedeva la compilazione domiciliare giornaliera per 14 giorni di scala VAS da 0 a 10, presenza di sensibilità termica ed eventuale assunzione di farmaci. I pazienti sono poi stati rivisti dopo 14 giorni dall'esecuzione del restauro ed è previsto un follow-up ogni 12 mesi con valutazione di vitalità, sensibilità termica, masticatoria e discolorazione marginale. Attualmente sono stati rivisti a 1 anno 28 pazienti (15 total etch e 13 self etch). L'analisi statistica è stata effettuata comparando i diversi valori di VAS ottenuti con un test di ANOVA per confronti multipli. La differenza è stata considerata statisticamente significativa quando $p < 0,05$.

Risultati. I risultati relativi alla VAS e alla sensibilità post-operatoria, espressi come media, sono rappresentati in tabella. L'analisi statistica ha evidenziato una differenza statisticamente significativa tra i due trattamenti, a favore dell'adesivo total-etch.

TOTAL ETCH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
VAS	1,09	0,19	0,08	0,08	0,08	0,11	0,08	0,05	0,05	0,05	0,05	0,05	0,08	0,05
SENS	0,22	0,11	0,05	0,05	0,08	0,03	0,05	0,03	0,03	0,03	0,03	0,3	0,08	0,03
SELF ETCH	1	2	3	4	5	6	7	8	9	10	11	12	13	14
VAS	1,86	0,84	0,44	0,54	0,49	0,51	0,27	0,24	0,21	0,19	0,21	0,16	0,16	0,19
SENS	0,2	0,17	0,14	0,11	0,09	0,11	0,11	0,09	0,09	0,09	0,09	0,09	0,09	0,09

Discussione e conclusioni. L'impiego di adesivi self-etch a due passaggi è indicato per i casi di restauri adesivi in cavità profonde, ove teoricamente il mantenimento del fango dentinale sulla dentina dovrebbe ridurre gli episodi di sensibilità post-operatoria. Tuttavia questo studio in vivo dimostra come gli adesivi total-etch non producono un aumento sia del dolore post-operatorio che della sensibilità termica nei 14 giorni successivi all'esecuzione del restauro. Evidentemente la mordenzatura della dentina profonda e la successiva applicazione di adesivi produce un sigillo del sistema tubulare efficace, senza andare a ledere l'organo pulpare. In letteratura sono presenti studi clinici che comparano le due tipologie di adesivo per quel che riguarda l'infiltrazione marginale e la sensibilità post-operatoria, non evidenziando differenze statisticamente significative tra le due sistematiche. Tuttavia tali studi non sono specificatamente riferiti a cavità profonde, per cui i risultati non sono fedelmente comparabili con quelli ottenuti in questo studio. In base ai risultati ottenuti possiamo affermare che, nell'ibridizzazione di dentina profonda, la

mordenzatura con acidi ortofosforico non risulta essere traumatica nei confronti dell'organo pulpare. I controlli a 1 anno evidenziano un comportamento clinico comparabile tra le due metodiche adesive, rendendole entrambe efficaci per i restauri adesivi diretti.

Interleukin-6 and 8 secretion, cell growth inhibition and morphological changes in human dental pulp mesenchymal stem cells treated by HEMA

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Aim. To evaluate morphological features, cell growth and Interleukin-6 (IL-6) and Interleukin-8 (IL-8) secretion in expanded ex vivo human dental pulp mesenchymal stem cells (DP-MSCs) after exposure to 2-Hydroxy-ethyl methacrylate (HEMA).

Methods. DP-MSCs were derived from the dental pulps of ten young donors. After in vitro isolation, DP-MSCs, characterized mesenchymal immunophenotype, were treated with 3 and 5mM of HEMA, and after 24, 48 and 72 hours of incubation their morphological features, cell growth, IL-6 and IL-8 secretion were analyzed.

Results. DP-MSCs showed a decrease of cell growth with both treatments, more evident at 5mM. Microscopic analysis showed extensive cytotoxic effects in treated cells, which lost their fibroblastoid features, and became retracted, even roundish, with a large number of granules. An up-regulation of IL-6 and IL-8 in treated cells cytokines is evident.

Conclusions. HEMA exhibits cytotoxicity, inhibits cells growth and induces morphological changes in cultured DP-MSCs. Moreover, in treated samples an up-regulation of soluble mediators of inflammation such as IL-6 and IL-8 cytokines can be found. In synthesis, we conclude that the direct application of HEMA potentially induces an inflammation process that could be the starting point for toxic response and cells damage in DP-MSCs.

Marginal adhesion and infiltration of a composite in a second class direct restorations: evaluation at sem and stereo microscope

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Aim. The purpose of this study was to test Esthet X HD composite in vitro using both SEM that the stereomicroscope

Methods. The study was conducted on 36 teeth. On each tooth a second class cavity was prepared. The teeth were etched (Total Etch Ivoclar Vivadent). Later it was applied a layer of adhesive (Comfort Bond+GLUMA Desensitizer). The Esthet X HD material was applied with a step by step technique. After curing specimens were assigned to one of two aging conditions: 1) thermocycling (350x, 5-55 0C), 2) immersion in citric acid at 37 0C, pH 3 for 1 week; a non-aged group acted as the control. 18 teeth were evaluated with SEM and the remaining teeth with stereo microscope. The degree of infiltration was assessed using the scoring system proposed by lemma.

Results. Group1-Specimens of this group gave the worst results. Measurements of the gap were higher than the other two groups with a maximum value of 84µm. The stereomicroscope evaluation revealed a degree of infiltration between 2 and 3 Group2-No gap was found in an intermediate position between the occlusal and the cervical margin with SEM evaluation, while at the marginal gap values range between 10µm and 37µm. The stereomicroscope evaluation revealed a degree of infiltration between 1 and 2 Control group-Specimens of this group have given the best results.

Conclusions. The composite examined showed a good adaptation to the cavity surface even if a substrate material that can absorb the stresses generated during polymerization wasn't used.

Marginal integrity evaluation of class II composite restoration: a sem analysis

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This in vitro study compared the marginal integrity of two composite. Standardized class II box cavities were prepared in both proximal faces of 9 extracted sound human molars with proximal box located only in enamel. 9 cavities were filled using the incremental technique with traditional universal microfilled composite (Group 1) and the other 9 cavities were filled using one single increment with a new flowable resin-based composite (Group 2). Marginal integrity of the restorations was evaluated in enamel finishing lines using a Scanning Electron Microscope (SEM) with a replica technique and the percentages of marginal gaps were calculated. The percentages of marginal gaps, perfect margins and non assessable areas were registered by an independent observer. In group 1 the perfect margin was 44,44%, gap 26,66% and non assessable areas 28,88%. In group 2 the perfect margin was 66,66, gap 15,55 and non assessable areas 17,77%. Marginal integrity was good for the two groups but it seems to be better for the group 2.

Minimally invasive ultrasonic removal of carious dentine associated with an anatomical modeling, in daily clinical practice

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Aim. According to the most recent findings in the literature, the cavity preparation in direct conservative restorations can be performed through various mechanical or ultrasonic devices, with adequate size than the cavity to prepare, and magnification systems. This work describes a cavity preparation technique in posterior direct restorations, with a minimally invasive approach, that makes use of ultrasonic devices and magnification systems. An anatomical restoration is associated with this technique, which allows minimal occlusal finishing.

Methods. A clinical case of Black's second class and WHO's second stage carious lesion on a mandibular right first molar was selected. After performing a radiographic investigation, a multiple rubber dam isolation of the operating field was made, after appropriate local anesthesia. After creating the occlusal access with spherical diamond burs mounted on the turbine, with abundant irrigation, all the interproximal carious dentine was removed by ultrasonic ball tips. To highlight the carious dentin and to check its removal, a chromic detector was used. The adjacent tooth interproximal wall was protected during cavity preparation with a metal matrix band. The cavity wall edges were beveled with olive burs. After these procedures, the cavity was treated with 0.2% digluconate chlorhexidine for 2 minutes to inactivate the MMP's and thus increase the bonding duration, rinsed and etched according to total-etch technique with 37% phosphoric acid. So, the cavity was filled using a fourth generation adhesive system and a nanohybrid composite, through P.K. Thomas modeling.

Results. The restoration obtained with this technique resulted excellent from the aesthetic and functional point of view, minimally invasive because of the ultrasonic tips and magnification systems, with minimal occlusal finishing and operating time reduction.

Conclusions. The authors consider that this technique can be compatible with routine clinical practice and easily reproducible, providing satisfactory results from the functional, aesthetic and ergonomic point of view.

Post - endodontic direct conservative restoration through a new generation system: a clinical evaluation

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Aim. Over the last decade the use of nanotechnologies has enabled the introduction of significant changes in the field of composite resins, which resulted in improving the mechanical properties of these materials, which have completely replaced the metal restorations in restorative dentistry. The purpose of this study is to present a direct conservative rehabilitation technique of endodontically treated teeth using a new generation dual fluid nano-filled composite designed for the construction of build-up for prosthetic abutments or inlays.

Methods. For the realization of the study, 20 patients aged between 20 and 60 were selected, with teeth undergoing endodontic therapy, with significant loss of tooth substance due to carious processes. After isolating the teeth with rubber dam, they have been rehabilitated by a direct conservative technique with the new generation system. The occlusal modeling was performed with a subtraction technique using diamond fine burs mounted on the turbine under abundant irrigation.

Results. The results were satisfactory and the patients enrolled in a program of continuous monitoring at least every 6 months to 5 years, still in progress. We consider that an adequate clinical experience of the operator and a marked knowledge of dental crown anatomy is necessary for the realization of this type of restoration.

Conclusions. In conclusion we can consider that the restoration of endodontically treated teeth may be performed through this system and it can be classified as both semi-final or final rehabilitation.

Reconstruction of severely damaged endodontically treated posterior teeth using a fiber reinforced composite

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Aim. Full cuspal coverage of structurally compromised, endodontically treated teeth seems to be the best choice as regards longevity and mechanical resistance. However, in order to reduce biological, time and financial costs clinicians seek alternative methods to build up devitalized teeth.

Methods. Twenty patients, aged 18 or older, were included in this clinical trial restoring 25 molars. Criteria for inclusion were two- to four-surface restorations, replacement of composite and amalgam restorations, teeth with decay reaching the pulp and teeth having homogeneous root canal fillings. Teeth with complete loss of the clinical crown were excluded. Teeth were restored using a combination of 37% phosphoric acid (Etching Gel, 3M ESPE), adhesive system (Scotchbond 1 XT, 3M ESPE), and microhybrid composite resin (Z250, 3M ESPE). The enamel peripheral shell of the restoration was built up first; a resin-impregnated piece of polyethylene ribbon fiber (Ribbond Triaxial) was covered with flowable composite (Tetric Flow, Ivoclar-Vivadent), placed on cavity walls, folded, and light cured; dentin and enamel occlusal surface stratification was then completed using successive cusp build-up technique. The study is still under implementation. All 25 restorations will be evaluated at 6 months and 1 year by two independent evaluators using modified USPHS criteria.

Conclusions. Direct fiber-reinforced composite resin restorations can be a viable alternative to traditional techniques.

Retrospective evaluation of fragment re-attachment

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Aim. to retrospectively evaluate a case series of traumatized teeth where a fragment re-attachment procedure had been performed.

Methods. All teeth included in the case series had undergone a fragment re-attachment procedure after a trauma in the anterior region. The fragment re-attachment procedure was performed according to a protocol accepted in literature (Chazine et al. Dental Traumatology 2011). The teeth included in this study were re-evaluated after a period ranging from 3 to 31 years. All data were collected using a questionnaire especially created for this purpose. 25 questionnaires were included in the study.

Results. All teeth evaluated in this retrospective study still had the fragment in place and none of them had to undergo a new re-attachment procedure. The fact of having a post re-attachment bevel ensured good stability to the re-attached fragment. All cases are still under control to ensure consistency in the data analyzed.

Conclusions. The procedure of fragment re-attachment ensures colour stability, pulp vitality and long-term durability. The use of the fragment is then highly recommended after a Ellis class II or III.

Rubber point polishing of a micro-hybrid composite resin: a surface roughness study

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Aim. Clinicians often prefer finishing and polishing protocols that involve few steps because they are time-saving. This rugosimetric study investigates the efficacy of each step of a polishing protocol by using a diamond bur and rubber points.

Methods. Forty composite discs (Filtek Z-250, 3M ESPE, USA) were prepared and randomly divided into 4 groups (n=10): G1, 40 μ m diamond bur (Intensiv SA, Switzerland); G2, bur and black rubber point (70 μ m) (Identoflex AG, Switzerland); G3 bur, black and yellow rubber points (40 μ m) (Identoflex AG); G4 bur, black, yellow and grey rubber points (5 μ m) (Identoflex AG). Specimens underwent linear and superficial profilometric analysis (Ra and Sa). Data were statistically analyzed by means of non-parametric tests ($p < 0,05$).

Results. The mean Ra values \pm DS (μ m) were: G1, 0.29 ± 0.17 ; G2, 0.11 ± 0.02 ; G3, 0.13 ± 0.04 ; G4, 0.07 ± 0.02 . The mean Sa values \pm DS (μ m) were: G1, 0.50 ± 0.23 ; G2, 0.18 ± 0.02 ; G3, 0.19 ± 0.04 ; G4, 0.11 ± 0.04 . Maximum roughness values were found in G1; a significant roughness decrease was registered in the groups in which the black (G2) and grey rubber points (G4) were used by considering both Ra and Sa parameters.

Conclusions. The roughness threshold value to inhibit bacterial adhesion (0.2 μ m) was already reached after polishing with black rubber point. It might be possible to shorten the polishing sequence by excluding the yellow rubber point. The use of the grey rubber point can further smooth the composite surface.

SEM analysis of the interference between bleaching and enamel etching

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Aim. SEM (Scanning Electron Microscope) evaluation of the existence of micromorphological differences between unbleached enamel (SNS) and bleached enamel (SS) and between etched enamel (SM) and etched after bleaching enamel (SSM). In the latter cases the etching agent has been applied right after bleaching to explore potential interferences between the two processes.

Methods. 12 upper incisors have been selected. The professional bleaching agent Opalescence Quick 45% PF (Ultradent Products Inc.) has been applied for 30 minutes on part of the vestibular surface of each specimen. After rinsing the specimens, a 37% orthophosphoric acid (Best Etch – Vista Dental Products) has been applied for 45 seconds on the whole surface, including the enamel part that had been bleached. The effect on the enamel surface has been evaluated with the scanning electron microscope (SEM).

Results. and Conclusions. We obtained 48 pictures that showed micromorphological differences between SNS and SS. In most of the cases (9 specimens on 12 examined) there are no micromorphological differences between SM and SSM; but since on the other 25% of the cases, the difference between SM and SSM is remarkable, we can hypothesize that is the natural composition of the idrossiapatite of each element that determines the final answer to the consecutive use of peroxide and orthophosphoric acid.

SEM evaluation of a flowable resin composite in II class restoration

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Aim. The purpose of this study was to evaluate at SEM the polymerization shrinkage of a flowable resin in II class restorations, related with the position into dental arches

Methods. The study was conducted on 36 extracted human teeth. On each tooth a II class cavity was prepared. The teeth were etched with Total Etch (Ivoclar Vivadent). An adhesive (Comfort Bond+GLUMA Desensitizer) was applied and cured. Then the flowable composite X-Flow was applied for 1 mm and cured. The remaining space of cavity was filled with Esthet-X-HD. The specimens were divided into two groups: Upper Group (simulating the position of the teeth into the maxillary bone), Lower Group (simulating position into the mandibular bone). Specimens were divided into three groups: 1) control group, teeth in a saline solution. 2) immersion in citric acid at 37 °C, pH 3 for 1 week; 3) thermocycling (350x, 5-55 °C)

Results. G1-This group showed the best results in terms of adhesivity and gap formation. The gap showed a value of 2 µm. No significant differences between upper and lower group. G2-The gap measurement showed a value of 2 µm. No significant differences between upper and lower group. G3-This group gave the worst results. The gap formation was 8,4 µm for the teeth of the lower group, and 25 µm for the upper group

Conclusions. A layer of X-Flow in II Class cavity reduces the formation of polymerization shrinkage at the interface dentin-composite, according to the results in restorations without a layer of flowable composite resin.

Study of resin diffusion in dentinal substrate of 4 adhesive systems: evaluation by SEM with software autoCAD

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Aim. The goal of the present study is to evaluate the capability of the tested adhesives to disseminate in the deep of the dentinal structure. The length of the resin tags formed by them is used to measure the adhesive's capability to diffuse inside the dentinal structure.

Methods. With the informed consent of the patient, a total amount of 16 teeth four sane third molars - extracted for orthodontic or periodontal reasons - were collected for this study: the teeth were divided randomly into four groups for each bonding system evaluated (XP Bond, Adper Schotchbond SE, Scotchbond MP, Xeno V). Each of them was subject to ultrasonic scaling, curettage and thorough cleaning with water. Then, each tooth was deprived of the highest half-part, saving its pulp chamber and the peripheral portion of enamel. After polishing by means of abrasive, fine grained wheels (Carbimet 2000 G), a layer of adhesive was placed to cover the occlusal surface of the tooth, according to the instruction of the producer, then recovered by about two millimetres of composite resin. Every sample was finally immersed in a solution of hydrochloric acid at 37% for an entire day to eliminate the organic and inorganic part and then, after a metallization procedure, was analysed by SEM. The pictures obtained by SEM were analysed through AutoCAD® software to evaluate the length of resin tags of the different adhesive systems

Results. The data were then processed by means of ANOVA test and BONFERRONI test. The results showed significant statistic differences among the four groups ($p < 0.001$). The SEM images confirmed that adhesive systems have a different diffusive and penetrating capability, that can be influenced by the different chemical composition of them. It has to be highlighted that, in teeth treated with XP Bond, very long resin tags were formed, with measurements much higher than the other ones. XENO V formed resin tags stronger and more thinned, with a few lateral extensions, structurally very compact, but with a scarce progression inside the dentine.

Conclusions. it should be affirmed that with regard to the parameter considered by the study, that is the length of the resin tags, the best performance was granted by the XP Bond system, while the other systems appeared, even with irrelevant differences, substantially comparable among them.

The masking ability of different composite resin thicknesses placed over colored thermo-sensitive fiber posts at various temperatures

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Aim. Posts containing thermo-sensitive colored pigment have been marketed in order to facilitate post identification during endodontic retreatment. Question may arise if this color change might occur also during function due to lowering of temperature for food and/or beverage assumption.

Methods. 5 master disks (MD) were made with a steel mold. For each disk, segments of 4 colored posts and 1 translucent post as control were placed in a circular disposition into composite resin. With the same mold 3 disks of composite resin (CRD) were prepared in 3 thicknesses: 0.5mm, 1.0mm, and 1.5mm. Digital images were taken of the various combination of MD/CRD, at 5°C and at 37°C. Lab color dimensions of posts were detected on the digital images with Adobe Photoshop CS4. CIELab ΔE was calculated between each posts and CR. ΔE were then calculated. Acceptability of differences were assessed with Fisher Exact Test ($p < 0.05$) with $\Delta E = 3.3$ as threshold for clinical acceptability.

Results. None of the ΔE calculated at 30° showed values of ΔE above the threshold for clinical acceptability. At 5° colored post ΔE values showed values above the threshold for blue, black and red posts when 0.5mm CR was overlaid, but none with 1.0 and 1.5 mm resin overlaying.

Conclusions. When thermo-sensitive pigment colored posts are used, overlaying 1mm of composite is sufficient to completely hide color changes of posts induced by lowering of temperature due to cold food or beverage.

Treatment needs in a population of patients in methadone substitution therapy

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Aim. The aim of this study was to assess the oral health in patients receiving opioid substitution therapy, in order to identify their real treatment needs and their compliance to possible cure.

Methods. Medical and social history, dietary habits, gnathologic problems, oral hygiene status of periodontal and hard dental tissue were assessed by clinical and x-ray examination in 17 patients aged between 22 and 51 years hospitalized for detoxification from opioids.

Results. The study resulted in the majority of patients being socially well integrated, working, having a sentimental relationship and having children. Their eating habits and oral hygiene at home improved compared to the active phase of heroin intake. All patients showed signs of gingival inflammation and calculus deposits and only 2 presented periodontitis. The pathology of caries is widely extended and most frequently affects approximal surfaces of maxillary anterior elements. Only 18% of patients presented marked edentulism while 54% showed between 2 and 6 missing teeth.

Conclusions. The data collected showed that social factors such as unemployment, poor education, lack of affection and lack of social integration can produce a negative effect on patients' personal care and oral health.

Treatment of a not complex crown fracture

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Aim. Object of the research is proving the therapeutic trial of re-pasting a dental fragment, when it is possible, preferring this choice mostly in young patients, since this technique is the most conservative.

Methods. in the Traumatology Department of Milan University, came to our attention, a child of eleven years, because of a trauma happened to school. While falling down, the boy had knocked his right upper incisor, and broken it. The tooth had a not complex crown fracture, and the tooth was positive to the vitality test with cold. So it is decided to re-paste the fragment, which had been stored under appropriate conditions.

Results. the perfect matching of the borders of the element with the ones of the fragment and a natural bevel created by the inclination of the fracture made it possible to mask the fracture line itself, and to obtain a functional and aesthetically satisfactory result.

Conclusions. this case shows how it is appropriate, under proper conditions, try to carry out a re-pasting of a dental fragment, especially in young subjects, so the patient is subjected to more conservative treatments, bearing in mind that later it will be possible to opt for a therapeutic solution that envisages a direct or indirect restoration of the tooth.

STUDENT SECTION

Classification of potentially malignant disorders of the oral mucosa: a review of literature

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Potentially malignant disorders of the oral mucosa are a fundamental subject in preventing oral squamous cell carcinoma. Their classification has been subjected to several revisions during the last 30 years, for the purpose of improving the placement and definition of this group of clinical appearances and of optimizing interactions between clinicians, pathologists and epidemiologists. The aim of this work is to review the modern classification of oral precancers particularly referring to the workshop coordinated in 2005 by the WHO in London, in which it has been recommended to abandon the repartition between "potentially malignant oral lesions" and "potentially malignant oral conditions", and to use the definition "potentially malignant oral disorders".

Clinical evaluation on effectiveness of the Nd:YAP Laser for initial treatment of perimplantitis: a case report

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Case presentation. Aim of this study is to evaluate effectiveness of Nd:Yap laser in treatment of perimplantitis in association with an hydrogen peroxide solution.

Methods. A patient, with a diagnosed perimplantitis of 2.2 element, was selected for a laser treatment to potentially improve perimplant condition. A Nd:Yap laser associated with hydrogen peroxide solution was used to treat perimplant pocket. This treatment was performed twice: initially (T0) and seven days after, the second (T1).

Results. three month control showed no inflamed perimplant tissue, bone level stabilized and implant neck exposed because of little retraction of perimplant tissue without edema. Same results after six months follow up.

Conclusions. Thanks to its properties, Nd-Yap laser beam is largely absorbed in H₂O₂, emphasizing oxygen bactericide effect against anaerobic pathogenic perimplant bacteria. Implant surface damages were avoided, edema and after-surgery pains were minimized.

Clinical-Biomechanical Analysis of a new Implant System Stability

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Aim. Evaluate factors influencing primary and secondary stability of an innovative implant system as well as marginal bone level changes.

Methods. Overall 86 NobelActive™ implants were inserted in upper jaws of 34 patients; 29 implants were immediately and 57 conventionally loaded, 42 in grafted-site and 44 in non-grafted site. A clinical-biomechanical assessment was performed at implant insertion and after one year; torque values and marginal bone levels were recorded. Implant stability data and radiographic values were correlated with implant site/loading features and patient anamnesis.

Results. Primary stability was higher for implants inserted in front upper jaw (62.3 ± 12.8 Ncm) as compared with posterior sites (47.7 ± 17.8 Ncm); a statistically significant correlation was found between bone type and insertion torque ($p=0.003$), while no correlation was found with secondary stability. Mean torque values after one year (58.6 ± 13.3 Ncm) tended to values determined by osseointegration. Mean bone resorption after one year was higher in smoking patients ($p<0.001$). Overall this new kind of implants showed primary and secondary stability higher than other implants.

Conclusions. Primary stability depends on mechanical factors: implant features and bone; secondary stability depends on factors influencing osseointegration. This new kind of implants has a high primary and secondary stability together with physiologic marginal bone-loss after 1-year in both immediately and laterally loaded implants.

Comparison between mechanical performances of self-ligating brackets versus conventional systems

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Aim. The present study analyzes the mechanical performances of a low-friction systems (stainless steel self-ligating brackets –SLB- F1000® Leone S.p.A.) in comparison with conventional elastomeric ligatures on conventional brackets (CLCB-Logic® Leone S.p.A.).

Methods. Inspired a previous studies, an experimental model consisting of five brackets was used to assess the mechanical performances of the different bracket-ligature systems with 0.014-inch super-elastic nickel-titanium wires in the presence of different amounts of apical canine misalignment of the canine (ranging from 1.5 to 6 mm). During loading and unloading, the activation and deactivation forces and energy were recorded and were tested 20 times.

Results. No difference significant ($P < 0.05$) in the amount of force released in presence of a misalignment of 1.5 mm was recorded among the two systems. When correction of misalignment was ranged between 3 mm to 6 mm, a noticeable amount of force for alignment was still generated by the passive SLB while no force was released in presence of CLCB.

Evaluation of Amniotic Fluid Stem Cells (AFSCs) onto different titanium surface micro-topography: an in vitro study

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Aim. Aim of this research was to analyse the potential of Amniotic Fluid Stem Cells (AFSCs) to grow, proliferate and differentiate onto implant surfaces subjected to different treatments, Sandblasting, Sandblasting and Large-Grit Acid Etching (SLA), and Full Contact Coverage (FCC).

Methods. Machined Ti disks (negative test), Sandblasted Ti disks, SLA Ti disks, and FCC Ti disks were used for this study. The surface micro-topography was observed by SEM and profilometric analysis. AFSCs were withdrawn from sheep in pregnancy. Each sample contains a cell number ranging from 2×10^3 to 2×10^6 . Pellets of amniotic fluid were directly resuspended in osteogenic medium, without the previous selection of Amniotic Fluid Mesenchymal Stem Cells, on the different Ti disks. At established times, cells on Ti disks were observed by SEM and the presence of calcium deposition in cell culture was observed at light microscope after Alizarin Red staining.

Results. At SEM analysis, such as at profilometer for Ra, Rz and Rsm values, tested surfaces appeared substantially different to each other. At SEM analysis, after 21 days from cell seeding, it was possible to observe how onto machined Ti disks no cell populations were found. Sandblasted Ti disks showed the scarce presence of lengthen and star shaped cells, while numerous cell aggregates were observed onto SLA Ti disks. However, the best results, in term of both cell number and cell differentiation, was obtained by AFCs onto FCC Ti disks, where abundant deposits of mineralized extracellular matrix could be displayed after Alizarin Red Staining.

Conclusions. Implant surface micro-topography is known to induce a different response by the host bone tissue. This study showed osteoblast-like cells obtained from amniotic fluid are capable to in vitro colonize Ti surface, but cell activity seems to be strictly connected to the surface micro-topography. Rough surfaces, and in particular FCC, a surface with a controlled roughness, obtained by an electrochemical treatment, may positively influence cell adhesion, growth, and differentiation.

Experimental Study on analgesic and healing effects of diode laser with regard to recurring aphthous stomatitis

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Aim. One of the most frequent pathologies of the oral cavity is recurring aphthous stomatitis (RAS). This multifactor immunologic inflammatory lesion causes patient discomfort, and treatment is controversial because of its unknown etiology. The aim of the present study was to assess the effect of Diode Laser (enjoy 5-sweden&martina) on the control of pain and the repair of RAS.

Methods. 30 patients with RAS (both sexes, mean age 34 years, no smoking) were divided into an experimental group of 15 patients treated with Laser () and a control group treated with a topical corticoid agent. The first group was treated with diode laser with wavelength of 670 nm, 50 mW, 3 J/cm² per point in daily sessions (once per day) on consecutive days. The second group received conventional treatment with triamcinolone acetonide 4 times per day. Both treatments were applied until the disappearance of the lesions. Pain intensity before and after treatment and clinical measurement of lesion size were determined daily for all patients.

Results. The results revealed that 81% of the patients reported a reduction in pain in the same session after laser treatment, and total regression of the lesion occurred after 4 days. Total regression in the corticoid group was from 4 to 7 days.

Conclusions. The use of diode laser demonstrated analgesic and healing effects on recurring aphthous stomatitis.

Fetal Diagnosis in Craniomaxillofacial Anomalies

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In this study we present our experience in fetal diagnosis and we want to underline the importance of the early diagnosis. During the period 2008-2011 we retrospectively reviewed clinical, radiographical and photographic documentation of 25 pregnant women with ultrasonic fetal diagnosis of craniomaxillofacial malformation. The MRI analysis confirmed the ultrasound diagnosis of 19/25 fetuses showing 3 cases of cleft lip (CL), 6 cases of cleft lip and palate (CLP) among those 2 were unilateral and 4 bilateral, 3 cases of CLP associated with micrognathism, 3 cases of micrognathism, 2 cases of maxillary hypoplasia, 2 holoprosencephalia HPE. In 6 cases second stage MRI showed improvement of first ultrasonic diagnosis: 2 cases of first diagnosed median maxillary defect resulted in bilateral CLP; in 1 case of HPE the MRI exam excluded the cleft lip and in the last 3 cases of CLP MRI showed more details of the palatal cleft. Many advances in health care are built on the evolution of technology, with these advances in prenatal imaging allowing one to see and diagnose disease not previously appreciated. Clinicians can better plan for the delivery of the neonate, with identified anomalies being optimally managed and the impact on the neonate's health minimized. The techniques for perinatal care of the patient with craniofacial abnormalities continue to evolve as the technology improves.

Histological typing of hyperplastic lesions of the gingiva

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Localized hyperplasias of the gingival tissue can be observed very frequently in the oral cavity and they are identified by the unspecific term "epulis". Nevertheless the classification of these entities is, still today, very variable and controversial, since the same definition conveys several kinds of hyperplastic proliferations of the connective tissue; in fact, although epulis are identified with localized outcomes of chronic inflammatory agents, like subgingival plaque or scale, they are characterized by clinical, and above all, histological aspects very different among them. Therefore, in this place, will be highlighted the most outstanding tissue features of each kind of lesion, in order to underline the importance of histological typing as instrument for the differential diagnosis.

In vivo analysis of oral microcirculation in post-menopause women by mean of videocapillaroscopy

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Aim. Menopause is defined as the permanent cessation of menstrual flow for one year. Deprivation of endogenous atheroprotective estrogen can involve microvascular system, because estrogen promotes nitric oxide synthesis and consequent vasodilatation, inhibiting vascular response to injury and potentially preventing atherosclerosis. Small vessels contribute to the vascular resistance and are involved peripheral vascular disease.

Methods. 27 women in menopause (Age: Mean±SD: 57.3±8.73) and 27 healthy subjects (Age: Mean±SD: 27.77±3.56) were examined. Oral microcirculation was investigated used oral videocapillaroscopy. The parameters were statistically evaluated though the Mann-Whitney test ($P<0.05$).

Results. The study showed statistically significant results in cases despite of controls for the following parameters: Decrease of Diameter of ansae (Mean±SD: 0.038±0.008; 0.045±0.005) and Increase of Tortuosity (Mean±SD: 3.83±1.13; 1.83±1.06) in labial mucosa; Decrease of density in periodontal mucosa (Mean±SD: 28.86±10.92; 89.62±17.83).

Conclusions. Microvascular dysfunction is a systemic process that occurs in similar way in multiple tissues. This study showed statistically significant changes in oral vascular pattern. The decrease of periodontal density confirms a greater risk of periodontitis in menopause women, because of the compromised vascular replacement and tropism. Sex hormone receptors in oral mucosa may modify the progression of periodontitis.

Invasive cervical resorption. A case report

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Aim. The AA describe a case of two teeth affected by invasive cervical resorption lesion (ICR). ICR is an aggressive form of tooth destruction that usually begins immediately below the epithelial attachment. The pathogenesis of ICR is not clear, but this pathology is mainly linked to dental morphology, especially to the interrelation of the mineralized tissues at the cervical area. ICR has been described as a purely inflammatory reaction initiated by microorganisms or as aseptic resorptive process, which can be secondarily infected. The main potential etiologic and predisposing factors for ICR reported in literature are orthodontic treatment, traumatic injuries, bleaching, periodontal therapy, and idiopathic factors. Depending on the location, severity, involvement of root canal system and restorability of the tooth there are generally three choices for treatment of ICR:

- no treatment with eventual extraction when the tooth becomes symptomatic
- immediate extraction
- access, debridement, and restoration of the resorptive lesion

Methods. A 24 years old female affected by ICR class 2 lesion (1.1; 1.2) was referred to our department. The treatment consisted in: 1) Periodontal surgery. 2) Rubber dam positioning. 3) Debridement. 4) Composite restoration A six month and 1 year recall demonstrated a complete dental/periodontal healing.

Conclusions. One year follow-up shows class second ICR lesion has a good prognosis if early detected and if the treatment option is right chosen.

Low-level laser therapy effects in temporomandibular disorders: a review

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Aim. Masticatory muscles myofascial pain is a common temporomandibular disorder (TMD) associated with pain and limited function of the masticatory system. The effects of low-level laser therapy (LLLT) for controlling discomfort of patients are frequently investigated, due to its recognized anti-inflammatory and analgesic properties. The aim of this systematic review is to analyze studies examining the effectiveness of LLLT in the treatment of TMD.

Methods. A literature research of published articles in the last 10 years, resulted in the retrieval of 19 potential articles.

Results. These 19 studies, supported by statistically data, showed that LLLT: (1) cause an improvement in muscle contraction strength and (2) in maximal mouth-opening; (3) is effective in reducing TMD symptoms, and has influence over masticatory efficiency. Furthermore (4) laser therapy may be more effective than other electrotherapy modalities. (5) Different lasers wavelength (λ 660nm, 780nm, 790nm or 830nm) can be used and the association of red and infrared laser light is effective in pain reduction.

Conclusions. LLLT is effective in reducing TMD associated pain. Thus, it is not possible to establish a treatment protocol. LLLT could be a possible treatment of TMD in association with a combination of active exercises, manual therapy, postural correction and use of occlusal splints.

Non invasive treatment of maxillary midline diastema in patients with an oversized upper labial frenum with Nd-Yap Laser frenectomy: a case report

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Aim. Maxillary midline diastema is an aesthetic problem. The presence of an oversized upper labial frenum and midline diastema are strictly correlated. After frenectomy is possible the spontaneous closure of the maxillary diastema.

Case presentation. The aim of this study is to present a new way to treat maxillary midline diastema with laser frenectomy especially in patients with a bad compliance such as children.

Methods. The selected patient was a 10 years old female in correct developing with an abnormal intermaxillary frenum and an upper midline diastema(2.6mm). Both canine teeth of the child were at the beginning of eruption. We used Nd-Yap Laser to perform frenectomy, avoiding child undergo psychological trauma. Fixed or mobile orthodontics appliance otherwise elastics around incisors were not used. A clinical and photographic follow up of the patient have been performed before, during and after laser surgical frenectomy and then at 15, 30, 60 and 120 days after surgery.

Results. and discussion: We saw a complete mucogingival healing and an initial closure of the diastema(1.2mm) already 30 days after laser frenectomy. The complete diastema closure was obtained 60 days after and at 120 days after follow up.

Conclusions. Nd-Yap Laser is useful in maxillary midline diastema closure procedure because it allows operator to perform frenectomy with a quick, clean and non invasive oral surgery.

Oral diseases in diabetic patients

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In 1997, the American Association of Diabetes proposed a classification system for diabetes based on its etiology. Therefore, diabetes is currently classified as: Type 1 or juvenile diabetes and Type 2 or acquired diabetes. In this study we analyzed most commonly oral disease in 150 patients: xerostomia, burning and erythema, ulceration, pharynx's infections *Candida Albicans* related, lichen planus, cheilitis, salivary glands tumefaction, gingival disorders, periodontal disease, abscess, alveolar bone loss, even if any of them it's a pathognomonic symptom. Patients who suffer from diabete mellitus type 1 are more affected by Bacterial, fungal and viral infections due to hyperglycemia and ketoacidosis that alter the immune response. Patients affected by noninsulin-dependent diabetes mellitus (without vascular disorders) don't show high rates of infections; in fact a good disease control reduces the probability of infections to minimum; also results show no differences in healing between diabetic and non-diabetic patients.

Panoramic radiography as occasional diagnostic element for vascular obstructive pathology at the bifurcation of carotid artery

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Aim. the oral and maxillofacial manifestation of some occult systemic disorder may be identified during the provisions of dental care. Atherosclerosis at the bifurcation of the carotid artery is a common cause of stroke, and, when such lesions are calcified, they may be identified on a panoramic radiograph since the carotid bifurcation lies within the field of a properly performed x-ray. This study assessed the utility of panoramic radiography as a diagnostic element for detecting carotid artery disease, such as atherosclerosis.

Methods. A male subject requiring conservative therapy came to our attention. In order to make a correct diagnosis and plan the treatment we prescribed a panoramic radiography. Since the anamnesis suggested the existence of vascular obstruction because of the coexistence of several cardiovascular risk factors like hypertension, diabetes, obesity, tabagism and sedentary lifestyle, we requested to include cervical vertebra C3 and C4 in the panoramic radiography.

Results. the exam of the panoramic radiography showed an obstruction at the bifurcation of the carotid artery. The patient were referred to his primary care physician in order to make arrangements for further examination with Doppler.

Conclusions. this clinical case, with other cases previously reported in Literature, assess the reliability of panoramic radiography as a valid support to identify vascular obstructive pathology at the bifurcation of the carotid artery.

Preventive and removing action on hydroxyapatite (HA) stains by polyvinylpyrrolidone (PVP) 5% in vitro

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Aim. To evaluate the efficacy of PVP 5% over inhibition and removal stain on HA.

Methods. First experiment tested a preventive effect. The pre-treatment of HA was made by a solution of PVP 5%. In a tube HA was mixed with PVP 5%, in another it was mixed with water. Tubes were stirred, filtered, washed and finally dried. The staining treatment was performed by a staining solution (Lipton Black Tea) placed with HAs and stirred. Stained HAs were filtered, washed and finally dried. The powders resulted were imaged in the same picture and processed with Adobe Photoshop to calculate $L^*a^*b^*$ and ΔE^*ab . Second experiment was planned to test PVP in removing stain. The HA was stained and used two weeks later. Control HA was mixed with water, test HA with a solution PVP 5%. HAs were stirred, filtered, washed and finally dried. The powders were analysed in the same picture.

Results. After the staining procedure, the HA pre-treated with 5% PVP resulted L 45 a 14 b 10, with water L 45 a 13 b 9, ΔE^*ab 1.4. The stained HA treated with water resulted L 41 a 5 b 14, with PVP 5% L 43 a 6 b 16, ΔE^*ab 3.

Discussion: ΔL (luminance, strictly linked to white intensity) indicates that the pre-treated HA is not different from control, instead ΔL for HAs treated for reducing stain suggests that a solution PVP 5% is capable of removing stains but its effect is visible only by an expert eye.

Conclusions. results suggest that PVP 5% is not capable in stain preventing but it can reduce staining.

The orthograd endodontic treatment as solution to estended endodontic lesions

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Aim. This case report wants to show how the only endodontic treatment can be a solution in big endodontic lesions affecting dental elements. Endodontic treatment, in certain cases, can be chosen instead of endodontic surgery or surgical removal.

Methods. A female patient came in emergency to our observation presenting swelling and pain at the right cheek. After clinical examination an OPT was requested and it revealed a big lesion in correspondence of the right mandibula, element 47. The lesion could be referred to a cystic lesion because it presented the typical sclerotic rim. Endodontic treatment using NiTi instruments was chosen because the dental element has never been treated before. Root canal washing was made with the only use of Clorexidina 0,2%. Rx control was requested after 3- 6- 12 months.

Results. The radiographic exams showed restitutio ad integrum gradually. Any symphoms lamented by the patient was solved.

Conclusions. This case notes how endodontic treatment can be in certain cases, the first choice in large endodontic lesions.

Treatment outcomes with two different anchorage systems for implant-retained overdentures

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Aim. The implant-retained overdenture (IR-O) is considered reliable option in the oral rehabilitation of the edentulous mandible. Low costs and realization simplicity, make it a good option treating different patients. Bars and studs are commonly used as anchorage to implants. Although there's no literature suggesting that any one method is significantly superior to another. To compare two options available as anchorage for IR-O: Ball attachment vs. Locator system.

Methods. Clinical parameters (plaque index, peri-implant probing depth and bleeding, marginal bone height), complications at baseline and 6 months recall evaluations were noted. Patient satisfaction (in terms of chewing ability, phonetics, esthetics and retention) was evaluated by questionnaire.

Results. Cumulative implant survival rate after 6 months of loading was 100%. There were no significant differences in peri-implant probing depth and bleeding between the two groups at baseline and recall evaluations. There were no significant differences in patients satisfactions, although Locator system allowed lower frequency of recalls.

Conclusions. The Locator system is a useful option for patients requiring IR-O.

Valutazione del sigillo marginale degli adesivi Self-etch:effetti delle variazioni di pH

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Lo studio valuta la variazione dell'efficacia del sigillo marginale e dell'adesività dei sistemi adesivi self-etch(one step)e total-etch(three step) alla riduzione del pH e al variare dell'interfaccia dei tessuti dentinali. Create 3 cavità di V classe, sono state restaurate un primo gruppo con self-etch, il secondo con total-etch, di cui una sottoclasse di entrambi sono state sottoposte a ciclaggio chimico e immerse alternativamente a pH 7.2 e 2.9. Analizzando i margini cavitari in microscopia ottica 20X si assegna loro una score da (0-3) in base al grado di penetrazione del colorante applicato (blu di metilene) dai margini fino a polpa. Utilizzando tale parametro di riferimento si sono avuti valori mediani del grado di microinfiltrazione maggiori in cemento-dentina rispetto quello di smalto-dentina, inversamente proporzionali alla qualità del sigillo marginale, in entrambi, ma lievemente superiori per gli adesivi self-etch sui total-etch a livello dello smalto per l'effettiva difficoltà dei primi a condizionare i tessuti a pH meno acido. Tale differenza giustifica le perplessità all'utilizzo dei self-etch nonostante i loro vantaggi in termini di risparmio di tempo, raggiungimento di una buona forza di adesione dovuto all'incorporazione dello smear layer e smear plugs nello strato ibrido in seguito alla ionizzazione dei gruppi funzionali dei monomeri acidi attivati dell'acqua. L'analisi statistica dei dati indica una differenza non significativa ($p > 0.05$) tra le due metodiche adesive.

Visual and instrumental assessment of the efficacy of an “in office” whitening system

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Aim. Teeth whitening is gaining popularity. Aim of the study was to evaluate the efficacy an “in office” whitening system (“Bio White”) visually and by means of 2 clinical spectrophotometers.

Methods. 10 patients wishing for a whitening treatment were selected for the study. The central upper incisor shade was assessed visually with Vitapan Classical Shade Guide. Tooth shade was instrumentally assessed with Spectroshade-MHT (SS) and Easyshade-Vita (ES) clinical spectrophotometers. The whitening treatments were carried on following the manufacturer indications. After polishing with a proprietary powder and application of liquid dam, three steps are performed consisting the first in treatment with desensitizing powder and whitening material, and the following of a combination of whitening powder and gel. After each step, the proprietary LED lamp system is used to activate the material for 12 minutes. After treatment, the teeth were measured again visually and instrumentally.

Results. The differences visually detected ranged between 3 and 9 of Vitapan Shade guide, with a mean of 5,2. SS measurements ranged between 3 and 7 with a mean of 4,4. ES measurements ranged between 0 and 4 with a mean of 1,4. Differences were detected between visual and instrumental assessment, as well as between the two clinical spectrophotometers, probably due to their different viewing geometry.

Conclusions. Preliminary data indicates that the whitening treatment is efficient.