

Multiple supernumerary premolars: their occurrence in three patients

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Abstract

The occurrence of supernumerary teeth in the premolar regions of three patients is reported. Of the 20 supernumerary teeth identified, 16 had crowns which resembled premolars and may thus be considered to be supplemental premolars, while the remainder were conical in shape. The delayed development of the supernumerary teeth in the premolar region supports the hypothesis that these teeth were part of a post-permanent dentition. The eruption of six of the eight supernumerary teeth in the 30-year-old patient demonstrated that given time some of these teeth can erupt into the dental arch.

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Introduction

Supernumerary teeth have been found in all of the tooth-bearing areas of the dental arches, and may occur in the primary or permanent dentition.¹ However, they are almost twice as common in the permanent as in the primary dentition.² The frequencies with which supernumerary teeth have been found in caucasians ranges from 1.7 per cent to 3.1 per cent,^{3,4} with twice as many males being affected

as females.⁵ Studies involving Eskimos, Japanese and Southern Chinese subjects have demonstrated that supernumerary teeth occur in 2.3 per cent to 3.4 per cent of Mongoloid people.⁵⁻⁷ The male to female ratio for Chinese children in Hong Kong has been reported as being 5.5:1 and 6.5:1 in two recent studies.^{7,8} The majority of supernumerary teeth have been found in the maxillary incisor region followed by the mandibular premolar and maxillary molar regions,^{3,4,9,10} and, more rarely, in the canine region.⁷ Whilst they can occur bilaterally, in the majority of cases they are unilaterally situated.⁹

Supernumerary teeth can be classified according to their morphology; when they are small and conical in shape they may be referred to as being rudimentary. A supernumerary tooth that is similar morphologically and structurally to a member of the normal dentition is referred to as a supplemental tooth.

Although case reports have been published on the occurrence of multiple supernumerary teeth in the premolar region,¹¹⁻²⁶ this dental anomaly is relatively rare; for example, only one was identified in a group of 1093 12-year-old Southern Chinese children.⁷

The present report describes three cases in which multiple, bilaterally distributed supernumerary teeth occurred in the premolar regions.

Case reports

Case 1

A 13-year-old Chinese girl presented complaining of 'extra teeth' between the mandibular left second premolar and first molar. The presence of the supernumerary teeth had been indicated to her two years previously by a dentist who had performed endodontic therapy on the first premolar in the same quadrant.

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Fig. 1.— The intra-oral radiographs of Case 1 revealed a total of five mineralized and unerupted supplemental premolars and one conical shaped supernumerary tooth. In addition, two unmineralized tooth germs were observed in the left maxillary and mandibular quadrants (arrows).

From the clinical examination it was found that she was in the permanent dentition stage with a discharging sinus on the buccal aspect of the alveolus between the mandibular right premolars, which was associated with an infected dens evaginatus on the second premolar.

The periapical radiographs revealed the presence of six mineralized supernumerary teeth distributed throughout all quadrants of her mouth. In addition, two radiolucencies in the left maxillary and mandibular premolar regions were identified which could have been unmineralized tooth germs. Of the mineralized supernumerary teeth, all had fully formed crowns and were situated at the level of the apical third of the roots of the first and second premolars (Fig. 1). The three supernumerary teeth in the mandible and the two in the maxilla were of normal size and shape and resembled premolars, whereas one on the right side of the maxilla was conical in shape and smaller than a normal premolar. The roots of the erupted premolar teeth in the mandible had been displaced by the supernumeraries which were situated between the roots of the erupted teeth.

Case 2

This 18 year-old Chinese male first presented complaining of two fractured maxillary central incisors. Radiographic examination revealed six supernumerary teeth in the premolar regions which had fully formed crowns and partially developed roots (Fig. 2).

The distribution of the supernumerary teeth was symmetrical with respect to the mid-line; there were two on each side of the maxilla and one on each side of the mandible. They were all located in close proximity to the apices of the erupted premolars. All but one of the supernumerary teeth were of normal premolar size and shape, the exception being the one situated closest to the apex of the maxillary left second premolar, which was peg-shaped and smaller than a normal premolar.

Case 3

This was a 30 year-old Chinese male who attended the dental clinic for the first time complaining of toothache in the maxillary right quadrant. The pain was due to the grossly carious



Fig. 2.—The periapical radiographs of Case 2 revealed five unerupted supplemental premolars and one conical shaped supernumerary tooth.

maxillary right second premolar which was subsequently extracted.

The clinical and radiographic examinations showed a total of eight supernumerary teeth. Two of these teeth were unerupted and were located in the maxillary right and mandibular left quadrants; the other six were erupted and located lingually to the normal premolars. Two of the eight supernumerary teeth had conical shaped crowns while the remainder had the characteristics of premolars (Fig. 3a, b). All of the supernumerary teeth were extracted.

None of the subjects was aware of any family members who had supernumerary teeth; however, no relatives were available for examination. The unerupted supernumerary teeth in the three cases had normal follicular spaces, and the only pathological change detected was the displacement of the roots of adjacent teeth in Case 1.

Discussion

The three patients described had a total of 20 supernumerary teeth in the premolar regions which is quite remarkable considering that supernumerary teeth in this region are rarer than in the incisor

regions.²⁷ In one study, only 30 patients out of the total of 21 609 subjects who were examined had supernumerary teeth in the premolar regions, compared with 290 subjects who had supernumerary anterior teeth, giving a prevalence of supernumeraries in the premolar regions of 0.14 per cent compared with 1.3 per cent for supernumerary anterior teeth.¹⁰ Multiple supernumerary teeth in the premolar regions are slightly rarer than single ones and only two of the subjects had more than two supernumeraries in the study published by Bodin and co-workers.¹⁰

Sixteen of the 20 supernumerary teeth, identified in these patients, could be considered to be supplemental premolars because they had a coronal morphology which resembled premolars. This supports the opinions of Stafne,²⁶ and Nordenram and Stromberg,²⁸ that supernumerary premolars usually resemble premolars in shape. However, they were, as stated by Oehlers,¹² often slightly smaller in size than normal premolars.

With respect to the distribution of the supernumerary teeth, it is difficult to know if there is any significance in the finding that 50 per cent of

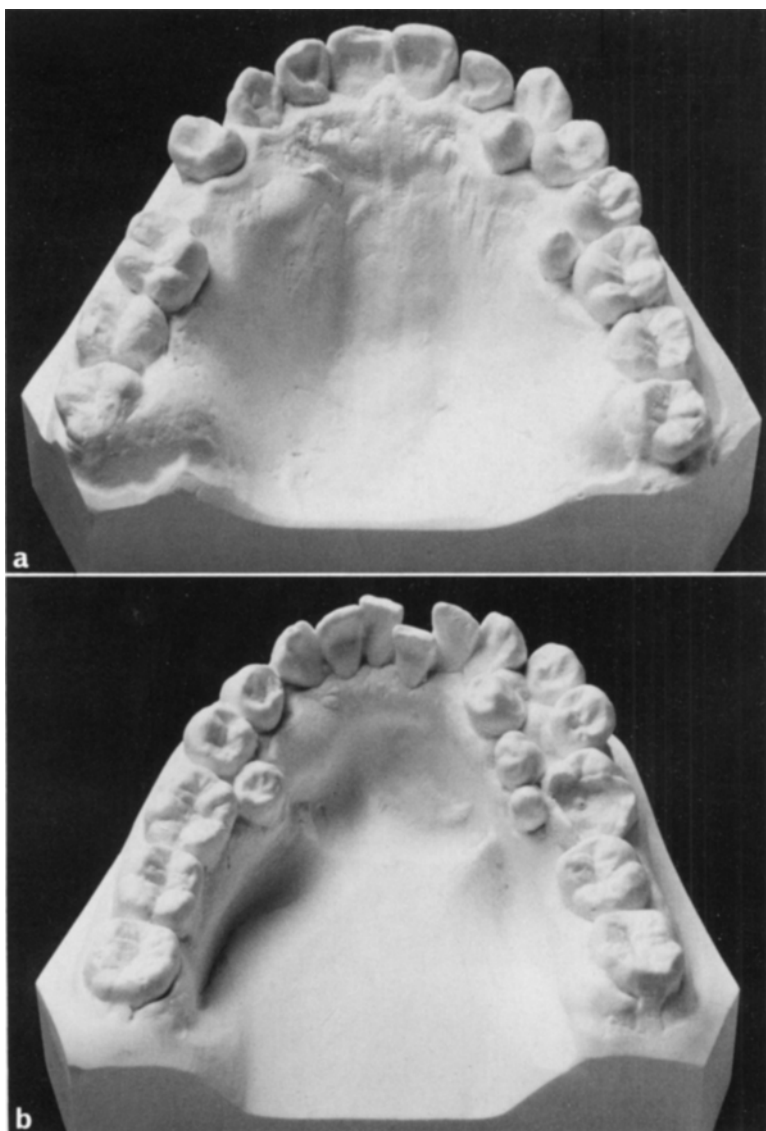


Fig. 3a. – The maxillary study cast of Case 3 showing one supplemental premolar and one rudimentary supernumerary on the left, and a swelling on the right side of the palate which contained one additional supplemental premolar.

Fig. 3b. – The mandibular study cast of Case 3 showing four erupted supernumerary teeth; one of which had a rudimentary morphology and three that were considered to be supplemental premolars. An additional unerupted supplemental premolar was located lingual to the mandibular left first premolar.

the teeth in these three cases, and 76 per cent of those in the other published studies have been located in the mandible.²⁴

Hyperactivity of the dental lamina has been cited as being responsible for the formation of additional tooth germs,¹ as has proliferation of the remains of the dental lamina.²⁹ Alternatively, they could be produced by dichotomy of the tooth germ.³⁰

Atavism has also been proposed as a cause; this hypothesis proposes a reversion to an ancestral human dentition which contained a larger number of teeth.^{1,30} The latter is extremely unlikely as no mammal is known to have had four premolars in each quadrant.¹² The majority of the supernumerary teeth in the three cases presented can be considered to be supplemental premolars. In addi-

tion, the stage of development of these teeth consistently lagged behind that of the normal premolars and the molars. Further, these supernumerary teeth were developing lingually and vertically to the teeth of the normal dentition. These features suggest that these supernumerary teeth may have developed as part of a post-permanent dentition rather than as an aberration of the normal permanent dentition; this is consistent with the hypothesis proposed by several other investigators.^{17,24,31}

Genetic factors may, to some extent, play a role in the formation of supernumerary teeth. Although no clear genetic mode of transmission has been established,² polygenic factors need to be combined with environmental factors for supernumerary teeth to be formed.³² Supernumerary teeth are often associated with syndromes which have a well established genetic mode of transmission; these include, for example, Gardner's Syndrome and cleidocranial dysplasia.^{33,34} In the present cases there were no familial histories of supernumerary teeth or any related syndromes.

Although surgical removal of supernumerary teeth is the treatment of choice, this may, especially in the mandibular premolar regions, cause damage to the neighbouring teeth and structures. The adjacent teeth may become non-vital due to disruption of their vascular-lymphatic supply; trauma to the mental nerve may result in paraesthesia or anaesthesia of the skin supplied by the affected nerve. If the teeth are extracted the patient should be maintained under long-term review, for additional supplemental premolars have been reported to have developed up to five years after the initial extractions.¹⁷

As demonstrated by Case 3, supernumerary teeth in the premolar region can, given time, erupt into the dental arch. Therefore long term observation and the extraction of these teeth after their eruption would reduce the likelihood of surgical complications. If supernumerary teeth are left *in situ* because they are asymptomatic, the patient must be kept under long-term review. This approach will allow early diagnosis of the development of a dentigerous cyst, delayed, or even non-eruption of teeth of the normal series, resorption, displacement of a tooth germ, malformation, migration, neurological symptoms, spacing or infection secondary to periapical infections from neighbouring teeth.^{10,35} As only 2 per cent of supernumeraries in the premolar regions in a previously reported study,¹⁰ exhibited any pathological changes, it may be justifiable to defer extraction of these teeth.

The cases presented demonstrated that multiple supplemental and rudimentary premolars can indeed

occur and may be part of a post-permanent series of teeth. In addition, given time some of them can erupt into the dental arch.

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