

Supernumerary Premolar Teeth in Siblings

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Abstract. *The familial nature of supernumerary teeth is discussed in this paper and illustrated with a report showing the development of supernumeraries in siblings. The orthodontic treatment and possible sequelae to the development of supernumerary teeth in the premolar region is highlighted.*

Index words: Complications, Siblings, Supernumerary teeth, Treatment.

Refereed Paper

Introduction

The prevalence of supernumerary teeth in British schoolchildren has been determined as 2.1 per cent in the permanent dentition (Brook, 1974). Supernumerary premolars are said to represent between 8.0 per cent (Nazif *et al.*, 1983) and 9.1 per cent (Grahnen and Lindahl, 1961) of all supernumerary teeth. Unlike other supernumeraries, they are more likely to develop in the mandible than the maxilla and usually resemble normal premolars in shape and size (Stafne, 1932). Stafne also states that there is a tendency for supernumerary teeth to commence their development later than the normal for teeth of that region.

The aetiology of supernumerary teeth is not fully understood, and both genetic and environmental factors have been proposed. This has been supported by the finding that supernumerary teeth are more common in the relatives of affected children than in the general population (Brook, 1984). However, this anomaly does not follow a simple mendelian pattern of inheritance. Supernumerary teeth may occur in isolation or as part of a syndrome, such as cleidocranial dysplasia, Gardner's syndrome or cleft lip and palate. Supernumerary teeth have also been associated with megadontia (Brook, 1984).

This paper reports supernumerary premolar teeth in brother and sister, where the supernumerary teeth have developed in different sites. Although seen in these siblings, it was not possible to elucidate any other family history of supernumerary teeth. Neither child had any relevant medical history.

Case 1

OA, a 12-year-old African female, presented in the permanent dentition with the exception of a retained maxillary deciduous canine and second molar. Radiographic examination showed the upper right permanent canine to be palatally impacted, and also revealed the presence of a supernumerary tooth in the mandibular left premolar region, between the roots of the second premolar and the first permanent molar (Fig. 1). This supernumerary tooth was at an early stage in its development and mineralization had only recently commenced. In view of the permanent

canine impaction, it was decided to remove the deciduous predecessor. The patient was seen for follow up one year later to monitor the position of the canine at which time a second radiograph showed further development of the supernumerary premolar (Fig. 2). Comprehensive orthodontic treatment was commenced following the surgical removal of the impacted canine and premolars in the remaining quadrants. The supernumerary premolar was left *in situ* following surgical advice as it was felt that the risk of damage to adjacent structures during its removal would outweigh the benefits. Orthodontic treatment was successfully completed in 14 months. Post-treatment radiographs show that, although the supernumerary has increased in size, there has been no damage to the surrounding tissues (Fig. 3). The supernumerary will be monitored periodically by clinical and radiographic examination.



FIG 1



FIG 2



FIG 3

Case 2

AA, a 13-year-old African male and the brother of the patient in Case 1, was referred by his general dental practitioner for an orthodontic assessment. Clinical examination showed the patient to be in the late mixed dentition. Radiographic examination revealed the presence of all permanent teeth, as well as supernumerary premolars in all four quadrants (Fig. 4). In each quadrant the supernumerary tooth was positioned occlusally to the unerupted second permanent molar and it was felt that this had contributed to the failure of eruption of these teeth. Surgical removal of all supernumeraries was carried out at that stage and the patient reviewed regularly to monitor molar eruption. Orthodontic treatment commenced 14 months after the removal of the supernumerary teeth at which time it was noted that the second molars were still unerupted. Radiographic examination showed that the upper second molars were erupting favourably while the lower second molar position had improved only slightly (Figs 5 and 6). Orthodontic treatment is ongoing.

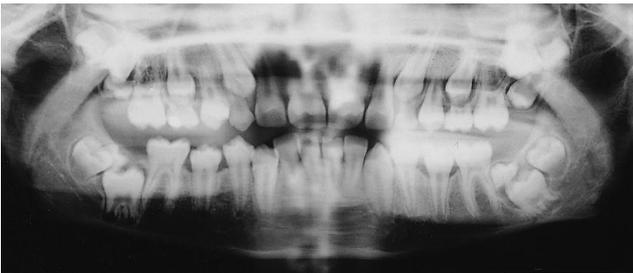


FIG 4



FIG 5

Discussion

Classification

Supernumerary teeth may be classified in one of the following ways.

1. Chronologically: as predeciduous, similar to permanent teeth, postpermanent or complementary.
2. Morphologically: as supplemental, where the supernumerary resembles the tooth of the normal series, or rudimentary, where the supernumerary may be described as conical, tuberculate, molariform or odontome.
3. Topographically: as mesiodens, supernumerary premolars or supernumerary molars.

Supernumerary teeth in the molar region are either paramolars or distomolars (fourth molars). Paramolars are rudimentary teeth which may develop buccally or lingually to the molar series. They are generally found between the second and third molars, as seen in Case 2, while in rare cases they may be seen more anteriorly. Distomolars develop distally to the third molar and have been described in both the maxilla and mandible. Again, they are rudimentary teeth, often conical in shape.

Aetiology

As stated previously, the mechanisms by which supernumerary teeth are formed have not been clearly identified and it is possible that the various types of supernumerary arise in different ways. Many theories have been proposed for this aetiology.

Heredity.

According to this theory, mutant genes give rise to the supernumerary teeth and this is supported by the finding of an increased number of supernumeraries in patients with facial and dental anomalies, such as cleft lip and palate (Millhon and Stafne, 1941) and cleidocranial dysplasia (Frame and Evans, 1989). The development of bilateral supernumeraries also suggests that they may be controlled by a mutant gene (Messer, 1972). The importance of heredity is emphasised by the increased number of supernumerary teeth found in the relatives of those affected. While an autosomal dominant inheritance has been suggested, the increased incidence in males to females indicates the possibility of a sex linked heredity (Brunner *et al.*, 1957).



FIG 6

Atavism.

This theory suggests that supernumerary teeth are a return to the primitive dentition which has since become obsolete (Stafne, 1932).

Embryologic aberrations.

There are several theories that ascribe the development of supernumerary teeth to disruption during embryologic formation. These include:

- (1) remnants of epithelial cells (Fisher, 1982);
- (2) supernumerary dental germs;
- (3) dichotomy of tooth germs (Nazif *et al.*, 1983);
- (4) proliferation of the dental lamina (Gardiner, 1961; Nazif *et al.*, 1983).

Progress zone.

This theory suggests that the progress zone of the dental lamina at the end of every tooth series or class gives rise to the supernumerary tooth (Schwartz, 1984).

Unified aetiology.

Brook (1984) proposed this theory based on a multifactorial model with a continuous scale and thresholds, related to tooth number and size. The position on the scale depends upon the cumulative effect of genetic and environmental factors. Occasionally, a major effect may be caused by a chromosomal or single gene anomaly. This would account for the finding of supernumerary teeth in the presence of other anomalies.

Sequelae

The presence of a supernumerary premolar does not necessarily occur in association with a malocclusion. As in the cases presented in this paper, the discovery of a supernumerary tooth is often an incidental finding on routine radiographic examination. This stresses the importance of a thorough radiographic survey prior to commencing orthodontic treatment.

Several effects of the paramolar may be seen. The position of the supernumerary may prevent or delay the eruption of the permanent dentition. It is rare for paramolars to occur in all four quadrants as in Case 2. More frequently, a supernumerary tooth in one quadrant will prevent the eruption of one of the permanent molars and the eruption of the contralateral tooth will be an indicator of the problem. Displacement of the permanent tooth may occur if it is able to erupt in the presence of a supernumerary. In addition, the supernumerary can cause displacement of the adjacent teeth with crowding.

Cystic lesions may develop around the crowns of the unerupted teeth, whether this is the supernumerary or the permanent tooth. Furthermore, supernumeraries may cause resorption of the roots of adjacent teeth or resorption of their own root if they erupt before the permanent teeth.

Since there is a tendency for supernumerary teeth to commence their development later than that of the teeth of the normal series, it is possible that paramolars may develop during the course of orthodontic treatment. Pre-orthodontic radiographs may fail to show any anomalies in tooth number and late forming premolar supernumeraries may be found only on progress or end of treatment radio-

graphs. It would be possible for such late forming supernumeraries to delay or prevent space closure, interfere with root torque and cause resorption of adjacent roots.

The presence of a syndrome should also be considered if multiple supernumeraries are discovered as there may be significant implications for the patients general medical condition. For example, in Gardner's syndrome, the associated intestinal polyps may undergo malignant change. However, the majority of supernumerary teeth occur in the absence of systemic abnormalities. In the condition 'Non-syndrome multiple supernumerary teeth' the highest frequency of supernumerary teeth was found to occur in the mandibular premolar region (Yusof, 1990).

Treatment

Treatment may take either of the following lines:

- (1) removal of the supernumerary;
- (2) maintenance of the supernumerary *in situ*, with appropriate follow-up.

Removal of unerupted supernumerary teeth is not without risk and the timing of the surgery must be considered. Early removal is recommended when the supernumerary is causing problems, such as the prevention of eruption of permanent teeth. When removing paramolars, there is a danger of damage to surrounding structures, such as inferior alveolar and mental nerves and roots of adjacent teeth. Perforation of the maxillary antrum, pterygomaxillary space or orbit may occur. Damage to the dental follicle or reduction of the enamel epithelium at the roots of the permanent teeth may cause ankylosis of these teeth. Later removal of the supernumerary can often be carried out conveniently at the same time as third molar removal. In all cases the risk-benefits of surgery must be carefully considered.

Conclusions

The cases reported here add to the evidence of familial supernumerary teeth, in particular those found in the molar region. They highlight the importance of a thorough clinical and radiographic examination of all patients with supernumerary teeth, and the possibility of supernumeraries occurring in relatives of those affected.

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