CASE REPORT

Review of Supernumerary Teeth and their Management in Children

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ABSTRACT

Supernumerary teeth are those that are excess of normal series of dentition. They are more common in the permanent dentition than in the primary dentition. The aetiology of the development of these teeth may be a genetic or hyper activity of the dental lamina or dichotomy of the tooth germ. These teeth may cause impaction of the adjacent tooth, diastema, rotation, crowding, and root resorption of the neighbouring permanent tooth or even cyst formation. The present paper describes the various types of supernumerary teeth, their aetiology and clinical presentations along with surgical extraction and minor orthodontic treatment of the affected teeth in children.

KEYWORDS: Supernumerary Tooth, Odontoma, Dichotomy, Hyper Activity, Diastema, Rotation, Orthodontic Correction

INTRODUCTION

The supernumerary tooth is the most common dental anomalies affecting children. They can be found in any region of the dental arch but supernumerary tooth in the maxilla near midline are more common (figure 1-14). The other supernumerary teeth in the permanent dentition are supplemental lateral incisors in maxilla, supernumerary mandibular premolars, paramolars and distomolars are in order of occurrence. In the primary dentition, supplemental lateral incisors in the maxilla are sometimes seen although supernumerary tooth in this series of dentition is rare. It may be single (figure 10) or multiple (figure 2), unilateral or bilateral, erupted (figure 6, 10) or unerupted (figure 2). It may be present in a single arch or in both the arches. The shape of these teeth may be conical (figure 6, 10) or tooth alike. When present in the midline of maxilla we popularly call them mesiodens. The mesiodens are usually conical in shape and single in occurrence but it may be multiple too (figure 2). The supplemental lateral incisors in the maxilla are mostly tooth alike

PREVALENCE

The prevalence of supernumerary tooth ranged from 1-3% in white people in the permanent dentition. It is less frequent in the primary dentition and the prevalence is about 0.3 to 1.7% (Scheiner and Sampson, 1997)[1]. In a survey of 2000 school children, Brook, 1974 reported that 2.1% of the British children have supernumerary teeth in the permanent dentition where as only 0.8% had supernumerary teeth in the primary dentition[2]. This low prevalence in the primary dentition may be the result of a difference in detection of these teeth because the primary teeth are exfoliated or extracted before examination of these children. It is also suggested that intra-uterine life is a more stable environment which prevents development of supernumerary tooth in the utero. Hence, less supernumerary teeth are seen in the deciduous dentition than in the permanent one. In a rare incidence Robert A, Barlow ST, Collard MM and Hunter MI, 2005 reported a case of bilateral supplemental deciduous canines in the maxilla.[3]

The frequency of supernumerary tooth in cleft lip and palate children are very high which is 22.2% in the permanent dentition.[4] It is suggested that supernumerary tooth associated with cleft lip and palate cases result from fragmentation of the dental lamina during cleft formation. The frequency of supernumerary tooth in cleido-cranial dysplasia ranged from 22% in the maxillary anterior region to 5% in the molar region.[5] The males are affected more with supernumerary teeth than females in the permanent dentition.

AETIOLOGY

The aetiology of the development of supernumerary teeth is thought to be multi-factorial. The genetic influence of its development was reported by various authors but it does not follow a simple mode of the Mendelian pattern of inheritance. Usually, multiple supernumerary teeth are associated with various syndromes like Gardner syndrome, Down syndrome, cleido-cranial dysplasia, cleft lip and palate which are highly correlated with heredity. Some authors recommend that hyper activity of the dental lamina is the result of various supernumerary

How to cite this article:
Kirtaniya BC, Gupta P, Sachdeva A, Gupta N. Review of Supernumerary Teeth and their Management in Children. Int J Oral Health Med Res 2016;3(2):32-37.

tooth formations. They suggested that a supernumerary tooth is developed from a third tooth bud near the permanent one of the dental lamina. The other theory of its origin suggested that the tooth bud splits into two equal or unequal parts resulting in two teeth formation which are equal in size or one may be normal and the other one may be distomorphic in size and shape. This is so called 'dichotomy theory'. This hypothesis is supported by an animal experiment in which split tooth germs have been cultivated in vitro. The supernumerary tooth seen in cleft lip and palate cases may explain this hypothesis.

CLASSIFICATION

Howard in 1967 classified supernumerary on the basis of morphology of these teeth as (1) conical, (2) tuberculate, (3) supplemental and (4) odontomas.[6]

The conical type (figure 2, 6 and 10) is the most commonly occurring supernumerary tooth in the permanent dentition. It is usually found in maxilla near midline and is popularly known as mesiodens. An erupted or un-erupted mesiodens may cause midline diastema, rotation (figure 6-7 and 10-11) and other malocclusions. It may occasionally be found high into the palate without causing any pathology.

The tuberculate type of supernumerary tooth has got more than one cusp or tubercle on its crown. These teeth are usually in paired and are commonly placed on palatal aspect of the central incisors. They rarely erupt and often cause impaction of central incisors. It is frequently described as barrel shaped and there may be a presence of dens invaginatus into the crown.

The supplemental type of supernumerary tooth refers to the duplication of the original tooth. In the permanent dentition it is mostly found in the maxillary lateral incisor region but supplemental premolars are found in the mandible and para-molars are often seen near permanent first molar region. In the primary dentition, the supernumerary teeth are basically supplemental type but there may be conical type also.

The odontomas are calcified tooth like structures and are of two types-complex composite odontoma and compound composite odontoma. When the calcified tissues are disorganised and hardly recognised as a tooth is called complex composite odontoma and when the calcified structures resembling some sorts of a tooth is called compound composite odontoma. Traditionally, they are classified as tumours of odontogenic origin.

The other classifications of the supernumerary tooth can be done on the basis of number of teeth present for example single tooth or multiple teeth and on the basis of the location where it is present for example mesiodens, paramolars, distomolars etc. Primosch R in 1981 classified supernumerary tooth into two groups as supplemental and rudimentary types.[7] The supplemental type refers to the duplication of the original tooth where as rudimentary type refers to the abnormal size and shape of the extra tooth.

CLINICAL FEATURES

Supernumerary teeth are the most common dental anomalies affecting children. An impacted mesiodens may cause midline diastema in maxilla in the permanent dentition which is un-aesthetic in appearance. Sometimes, an impacted supernumerary is inverted (figure 2) which may cause impaction of the adjacent permanent teeth (figure 1) usually the incisors (Howard RD, 1967;Mitchell L and Bennet TG, 1992)[6,8]. The impaction of permanent central incisor is noticed when both the lateral incisors are erupted into the oral cavity (figure 1). It may cause retention of the primary incisors too. Due to the presence of supernumerary tooth, the permanent incisors may be displaced from its normal position causing malocclusion. There may be rotation (figure 6, 10) and crowding (figure 6) in the dental arch due to the presence of these teeth. A supernumerary tooth may cause root resorption of the adjacent tooth but the incidence is very low. In rare circumstance, a supernumerary tooth may cause dentigerous cyst formation (Awang MN and Siar CH, 1989, Ray et al 2009).[9,10] Not infrequently, a supernumerary tooth may erupt towards the floor of the nose or into the maxillary sinus instead of towards the palate (Ray et al 2009, Graber T.M 2001).[10,11] An erupted paramolar or distomolar may cause crowding in the posterior segment of the dental arch leading to food impaction and caries and /or periodontal disease. Occasionally, a supernumerary tooth is asymptomatic and discovered in a routine radiographic examination. Whether a supernumerary tooth is erupted or un-erupted, most often it causes malocclusions and un- aesthetic appearance of the child which is of great concern to the parents as well as to the paediatric dentists.

DISCUSSION

The management of supernumerary teeth will depend upon clinical presentation of the associated malocclusions (figure 1-14) and other pathology. Often an un-erupted or erupted supernumerary may cause delayed eruption of the permanent tooth (figure 1) which should be removed from the dental arch as soon as it is noticed for spontaneous eruption (figure 1-5) of the respective tooth or teeth. Retrospective studies have shown that 90% of the impacted incisors will erupt spontaneously (figure 1-5) following removal of the supernumerary tooth within 18 months and 30% requiring orthodontic alignment (Mitchell and Bennet, 1992; Di Biase DD, 1971; Ashkenazi et al 2007).[8, 12, 13] However, spontaneous eruption is unlikely to occur if insufficient space exists in the dental arch, or the impacted tooth is significantly displaced or the tooth is lying deep into the bone. In such conditions complex surgery and orthodontic traction is required. Moreover, tuberculate supernumeraries, odontomas and those seen in older children with

advanced root development are also less likely to erupt spontaneously (Ashkenazi et al 2007)[13].

The timing for extraction of an un-erupted or impacted supernumerary tooth is a controversial issue but most authors practice extraction of these teeth in the early mixed dentition period (figure 1-5). They suggest that when the permanent incisors exhibit fifty percent of their root development, surgery should be performed (L B Kaban and M J Troulis, 2004).[14] This ensures safety of the permanent teeth and prevents interference with their eruption. Late intervention may cause closure of spaces for the spontaneous eruption of the permanent tooth in its place. A few authors recommend surgical removal of the supernumerary tooth along with surgical exposure of the impacted tooth at the same time (figure 1-5). However, others recommend a conservative approach without exposure of the impacted incisor while performing surgical removal of the impacted supernumerary tooth (Di Bias 1971)[12]. The decision should be made on the basis of the impacted tooth or teeth whether it is high up into the alveolus and how far it is displaced.

A paramolar may be erupted palatally or bucally, near the first permanent molar. It will cause food impaction and subsequently caries or periodontal disease to the permanent teeth. Therefore, this tooth should be extracted. A distomolar usually removed at the same time as third molar extraction.[14] Supernumerary mandibular premolars should be removed when they can be distinguished from the adjacent normal premolars. When an impacted supernumerary is not causing any pathological conditions or malocclusions as mentioned above, or when it is placed extremely high into the palate, it can be left as such but periodic evaluation for any pathologic changes should be carefully monitored.

The other indications for surgical extraction includes when a supernumerary is in close proximity with the roots of incisors where active orthodontic treatment is required for their correction needs surgical extraction. In the case of cleft lip and palate, the presence of a supernumerary tooth may interfere with secondary bone grafting require surgical extraction. For placement of an implant into the jaw, a supernumerary tooth may interfere with its right position into the bone might require surgical extraction. No treatment is recommended for supernumerary tooth present in the primary dentition. Other than surgical extraction of supernumerary teeth they can be monitored without removal when (1) satisfactory eruption of related teeth has occurred; (2) no active orthodontic treatment is envisaged; (3) there is no associated pathology and (4) removal would prejudice the vitality of the adjacent teeth.

REPORT OF CASES

Case 1: A 9 years and 6 months old boy was complaining of not erupting his upper right central incisor tooth (figure1) and immediately we took an IOPA radiograph which revealed impacted 11 and two supernumerary teeth one erupted and other one impacted (figure 2). The parents were informed about it and the treatment plan was explained to them. A full thickness of palatal mucoperiostal flap was raised from right permanent first molar up to the midline but not crossing it to prevent injury to the incisive nerves and vessels (figure 3). After sufficient bone was removed from the palate to expose the mesiodens, we extract it with an elevator. In this case we did gingivectomy also to expose 11 (figure 3) after removing the supernumerary tooth. The operation was carried out under local anaesthesia in the department of Paediatric Dentistry. Prior to surgery routine blood and urine investigations were carried out the results were within normal limit. Subsequently, after removal of supernumerary teeth the impacted 11 erupted into the oral cavity spontaneously (figure 1-5).

Figure 1: Showing an erupted mesiodens and impacted 11

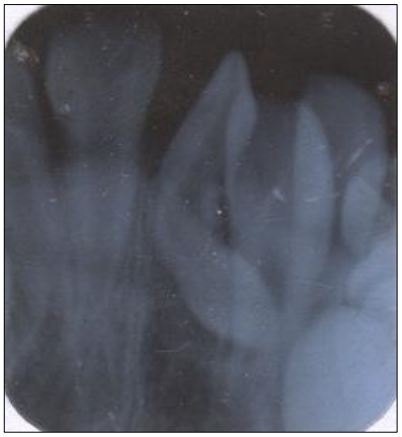

Figure 2: IOPA radiograph showing another impacted supernumerary tooth which is inverted and impacted 11

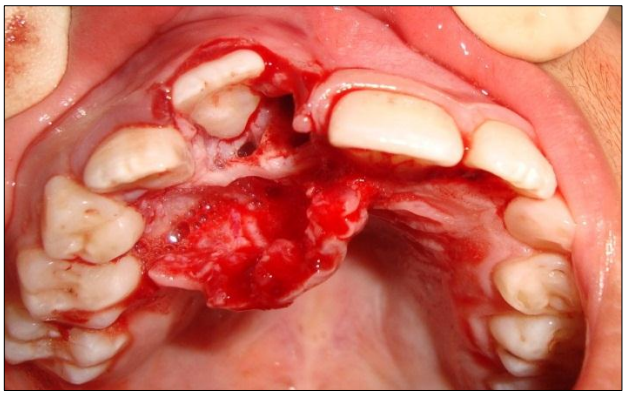

Figure 3: Palatal flap raised and both the supernumerary teeth removed

Figure 4: Flap closed after gingivectomy and exposing 11

Figure 5: spontaneous eruption of 11 within a few months

Case 2: Another boy of 10 years old was complaining of extra-tooth in the midline of maxilla and rotation of upper left central incisor (figure 6). Intra-oral examination revealed an erupted mesiodens in the midline of maxilla with rotation of 21 at 90 degree. There was mild crowding seen in the maxillary anterior teeth. The intra-oral periapical radiograph was showing no more supernumerary tooth present in the maxilla. The supernumerary tooth was extracted immediately (figure 7) and a removable orthodontic appliance was given (figure 8). After correction of rotation of 21 we did correct minor crowding with removable appliance only. To prevent relapse of rotation, supra-crestal fibrotomy was performed in 21. The follow up results are shown in figures 6-9.

Figure 6: Erupted mesiodens and rotation in 21

Figure 7: Supernumerary tooth extracted

Figure 8: A removable appliance for correction of 21

Figure 9: Rotation corrected

Case 3: An 11 year's old boy was complains of extra tooth in the upper jaw (figure 10). On clinical examination an erupted mesiodens was noticed in the maxilla with rotation in 11. The intra- oral periapical radiograph revealed no more supernumerary tooth present in the maxillary anterior region. There was presence of cross-bite in 12 as well as bilateral posterior cross-bite

Figure 10: An erupted mesiodens with malocclusions

due to contraction of upper arch. The permanent canine was erupting buccally due to space deficiency in the maxilla. After study models were made, we extract the supernumerary tooth immediately (figure 11). The crossbite, rotation and diastema were corrected with removable appliances (Figure10 -14).

Figure 11: Extracted supernumerary tooth

Figure 12: A finger-spring appliance for correction of diastema

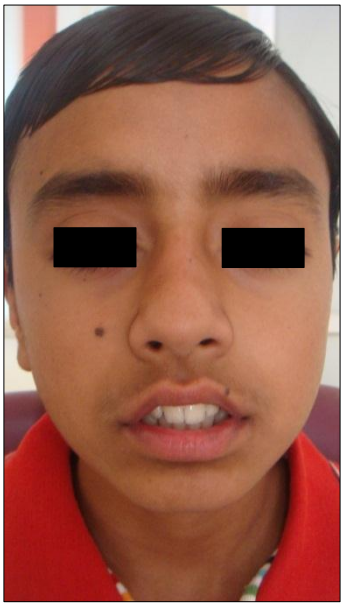

Figure 13: Post-operative view after correction of malocclusions

Figure 14: Close up post-operative view

CONCLUSION

In the practice of paediatric dentistry, supernumerary teeth are very common findings which create lots of malocclusions. The mesiodens in the permanent dentition and supplemental tooth in the deciduous dentition are a more common supernumerary tooth. Often, parents are so anxious about missing front teeth of their kids or ugly appearance of their children due to the presence of such teeth, seek early treatment. The Paediatric dentists should diagnose the condition properly and provide interceptive treatment as early as possible to reduce treatment cost, save time and prevent other complications.

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Source of Support: Nil
Conflict of Interest: Nil