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Supernumerary Teeth – An Overview of Location, Diagnosis and Management.

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ABSTRACT

A supernumerary tooth is one of the developmental problems in child. Supernumerary teeth can present in various forms and in any region of the mandible or maxilla, but have a predisposition for the anterior maxilla. They can cause a variety of complications in the developing dentition. This article reviews the clinical features, diagnosis and options for the management of supernumerary teeth.

Keywords: Supernumerary teeth, Mesiodens, Management

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INTRODUCTION

Supernumerary teeth, hyperdontia, are of particular interest to pediatric dentists who commonly make the initial diagnosis. Development of the tooth is a continuous process with a number of physiologic growth processes and various morphologic stages interplay to achieve the tooth's final form and structure. Interference with the stage of initiation, may result in single or multiple missing teeth (hypodontia or oligodontia respectively) or supernumerary teeth [1]. A supernumerary tooth is the one that is additional to the normal series and can be found in almost any region of the dental arch [2]. The term mesiodens denotes supernumerary tooth located between the maxillary central incisors [3].

PREVALENCE

In the primary dentition, the incidence is said to be 0.3%-0.8% and in the permanent dentition 1.5%-3.5% [4]. The low prevalence of supernumerary teeth in primary dentition is lower because it is under reported [5] and it is often overlooked, because the supernumerary teeth are often of normal shape (supplemental type), erupt normally using spaces in primary dentition, and appear to be in proper alignment; and can be mistaken for germination and fusion anomalies [6]. There seems to be a racial variation in the prevalence of supernumeraries with a frequency higher than 3% in Mongoloid races [7]. There is no significant sex distribution in primary supernumerary teeth; however, males have been shown to be affected more in the permanent dentition than females. Supernumerary teeth are estimated to occur in the maxilla 8.2 to 10 times more frequently than the mandible, and most commonly affect the premaxilla.

ETIOLOGY

The aetiology of supernumerary teeth is not completely understood. Both genetic and environmental factors have been considered. Several theories have been suggested to explain their occurrence.

Atavism

It was originally suggested that supernumerary teeth were the result of phylogenetic reversion to extinct primates with three pairs of incisors [8]. This theory has been largely discounted.

Dichotomy theory

This stated that the tooth bud splits into two equal or different-sized parts, resulting in the formation of two teeth of equal size, or one normal and one dysmorphic tooth, respectively [9]. However, this theory has also been discounted.

Dental lamina hyperactivity theory

This involves localized, independent, conditioned hyperactivity of the dental lamina. According to this theory, a supplemental form would develop from the lingual extension of

an accessory tooth bud, whereas a rudimentary form would develop from the proliferation of epithelial remnants of the dental lamina⁸.

Genetic factors

These are considered important in the occurrence of supernumerary teeth. Many cases have been reported of recurrence within the same family⁹. A sex-linked inheritance has been suggested by the observation that males are affected approximately twice as often as females [9].

CLASSIFICATION OF SUPERNUMERARY TEETH

Primosch classified them into two types according to the shape - supplemental (eumorphic) and rudimentary (dysmorphic, including conical, tuberculate and molariform type) [8].

Based on morphology

Conical

Conical-shaped supernumerary teeth are the most common [9]. They usually present with conical or triangular-shaped crowns and complete root formation. They are found most often as isolated single cases and are usually located between the maxillary central incisors (mesiodens) [8]. However, they can also occur as bilateral (mesiodentes) structures in the premaxilla.

Tuberculate

The tuberculate supernumerary has a barrel-shaped appearance and a crown consisting of multiple tubercles [8]. It may be invaginated [9]. Unlike conical supernumerary teeth, which have complete root formation, tuberculate types have either incomplete or absent root formation [8]. They are generally larger than conical supernumerary teeth and are usually found in a palatal position relative to the maxillary incisors [8,9]. Tuberculate supernumeraries are often paired and bilateral supernumerary cases have a predominance of tuberculate shaped teeth. It has been suggested that tuberculate supernumeraries may represent a third dentition [8].

Supplemental

Supplemental supernumerary teeth resemble their respective normal teeth. They form at the end of a tooth series. The most common supplemental tooth is the permanent maxillary lateral incisor, although supplemental premolars and molars also occur [9]. The majority of supernumerary teeth in the primary dentition are supplemental and rarely remain unerupted [9].

Odontomes

These are hamartomas (benign, disordered overgrowths of mature tissue) comprising all dental tissues and appearing radiographically as well-demarcated, mostly radio-opaque lesions in tooth-bearing areas. There are two different types of odontome: compound and complex. Compound odontomes comprise many separate, small tooth-like structures. A complex odontome is a single, irregular mass of dental tissue that has no morphological resemblance to a tooth.

Based on location

Mesiodens

Typically, a mesiodens is a conical supernumerary tooth located between the maxillary central incisors [9]. These supernumerary teeth are usually located palatal to the permanent incisors, with only a few lying in the line of the arch or labially. The mesiodens is usually small and short, with a triangular or conical crown.

Paramolar

A paramolar is a supernumerary molar, usually rudimentary, situated buccally or lingually/palatally to one of the molars or in the interproximal space buccal to the second and third molar.

Distomolar

A distomolar is a supernumerary Tooth located distal to a third molar and is usually rudimentary. It rarely delays the eruption of associated teeth.

Parapremolar

This is a supernumerary that forms in the premolar region and resembles a premolar.

COMPLICATIONS

Various complications might occur as a result of the presence of mesiodens, including delayed eruption, crowding, spacing, impaction of permanent incisors, abnormal root formation, alteration in the path of eruption of permanent incisors, median diastema, cystic lesions, intraoral infection, rotation, root resorption of the adjacent teeth or even eruption of incisors in the nasal cavity.

MEDICAL CONDITIONS ASSOCIATED WITH SUPERNUMERARY TEETH

Developmental disorders that show an association with multiple supernumerary teeth includes

- Cleft lip and palate;

- Cleidocranial dysostosis
- Gardner's syndrome.

Less common disorders include Fabry Anderson's syndrome, Ehlers-Danlos syndrome, Incontinentia pigmenti and Trico- Rhino-Phalangeal syndrome⁹.

DIAGNOSIS

It is discussed in the literature that the sooner the diagnosis the better the prognosis. The clinician's knowledge of common anomalies and their location in the primary and mixed dentition will result in early diagnosis and may consequently prevent further complications. Unilateral persistence of a deciduous incisor, failure of eruption or ectopic eruption of a permanent incisor, a wide diastema, or rotation of erupted permanent incisors should alert the clinician to the possible presence of supernumerary teeth and indicate appropriate radiographic investigation. The most useful radiographic investigation is the rotational tomograph (OPG), with additional views of the anterior maxilla and mandible, in the form of occlusal or periapical radiographs. If concerns are present regarding the possibility of root resorption of a permanent tooth caused by a supernumerary tooth, then long-cone periapical radiographs will be required for diagnosis. In order to localize an unerupted supernumerary or normal tooth, the parallax method is recommended. Cone-beam computed tomography has recently been used to evaluate supernumerary teeth. This technique yields detailed three dimensional images of local structures and may prove useful in pre-treatment evaluation of supernumerary teeth and surrounding structures.

MANAGEMENT

Management of supernumerary teeth depends on the type and position of the tooth. Immediate removal of mesiodens is usually indicated in the following situations; inhibition or delay of eruption, displacement of the adjacent tooth, interference with orthodontic appliances, presence of pathologic condition, or spontaneous eruption of the supernumerary tooth. Munns stated that the earlier the mesiodens is removed, the better the prognosis. There are two methods for extraction of mesiodens; early extraction before root formation of the permanent incisors and late extraction after root formation of the permanent incisors [9]. Some authors recommend extraction of mesiodens in the early mixed dentition in order to facilitate spontaneous eruption and alignment of the incisors [7]. There is controversy in the literature regarding the time of removal of any unerupted mesiodens. Henry and Post suggested delayed extraction of the mesiodens about the age of 10 when the apex of the central incisor nearly forms. If treatment is postponed after this age, more complex surgical and orthodontic treatment may be necessary [10]. Garvey recommended monitoring of mesiodens in the following situations; satisfactory eruption of the succeeding teeth, absence of any associated pathologic lesions and risk of damage to the vitality of the related teeth. These teeth, which are usually found by chance, are better left in place under observation². Clinician should consider patient condition in the final decision, however a recent study of Yagüe-García et al emphasized that the early removal of the supernumerary teeth in order to prevent complications is the treatment of choice [11].



CONCLUSION

Mesiodens as the most prevalent form of supernumerary teeth in permanent dentition is not a rare condition. Evidence regarding etiology of mesiodens indicates that genetic susceptibility together with environmental factors might increase the activity of dental lamina, leading to formation of the extra tooth/teeth. Extraction of mesiodens in the early mixed dentition helps spontaneous alignment of the adjacent teeth; however, symptomless cases could be left untreated along with regular checkup.

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