

Supernumerary Teeth: A Review Article

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A supernumerary tooth (ST) is defined as any tooth or odontogenic structure that is formed from tooth germ in excess of usual number for any given region of the dental arch. They may be single or multiple and unilateral or bilateral in distribution and can occur in any region of the dental arch. These may occur in primary and permanent dentition. Supernumerary teeth are more frequent in males. They are classified based on form, morphology, location and occurrence. Several hypotheses have been proposed to explain the occurrence of ST. However, a combination of environmental and genetic factors has been proposed. This article presents an overview of the clinical problems associated with supernumerary teeth and includes a discussion of the classification, diagnosis, and management of this difficult clinical entity.

Keywords: Dental arch, Genetic, Morphology, Odontogenic, Supernumerary tooth

INTRODUCTION

Supernumerary tooth (ST) is defined as “any tooth or odontogenic structure that is formed from tooth germ in excess of usual number for any given region of the dental arch.”¹ They may be unilateral or bilateral and single or multiple, in distribution, can occur in any part of the tooth bearing areas in both dental arches, and found in both primary and permanent dentition. Cases involving one or two supernumerary teeth most commonly involve the anterior maxilla, followed by the mandibular premolar region.² When multiple supernumerary teeth are present (>5), the most common site affected is the mandibular premolar region. The prevalence of supernumerary teeth ranges from 0.5% to 3.8% in permanent dentition and from 0.3% to 1.9% in primary dentition. The sex distribution of supernumerary teeth in primary dentition appears equal, whereas supernumeraries in permanent dentition occur more frequently in boys than girls.³ The exact etiology of supernumerary teeth is unknown, however several theories have been postulated to explain their presence: The phylogenetic theory as a regression to the anthropoids whose dental had more teeth, the autonomic recessive inheritance or linked to the X chromosome, an abnormal reaction to a local traumatic episode, environmental factors, dichotomy of the tooth germ and the theory of hyperactivity

of the dental lamina, are the most accepted.⁴ Supernumerary teeth are less common in the deciduous dentition with a reported incidence of 0.3-1.7% of the population. Possible explanations for the less frequent reporting of deciduous supernumerary teeth include less detection by parents, as the spacing frequently encountered in the deciduous dentition may be utilized to allow the ST or teeth to erupt with reasonable alignment. Also many children have an initial dental examination following eruption of the permanent anterior teeth so anterior deciduous supernumerary teeth which have erupted and exfoliated normally would not be detected.⁵

Effects of supernumerary teeth on the developing dentition vary. There may be no effect with the ST or teeth discovered either as a chance radiographic finding or following their eruption. Crowding may be evident due to an increased number of erupted teeth. Failure of eruption of adjacent permanent teeth is the most frequent occurrence and occurs in 30-60% of cases. The supernumerary or adjacent teeth may be displaced and ectopic eruption of either is not uncommon. Supernumerary teeth may also cause diastemata, root resorption of adjacent teeth, malformation of adjacent teeth such as dilacerations and loss of vitality of adjacent teeth.⁶

PREVALENCE

Multiple supernumerary teeth are rare in individuals with no other associated diseases or syndromes.⁴ The conditions commonly associated with an increased prevalence of supernumerary teeth include cleft lip and palate, cleidocranial dysplasia and Gardner syndrome. Supernumerary teeth associated with cleft lip and palate

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result from fragmentation of the dental lamina during cleft formation. The frequency of supernumerary permanent teeth in the cleft area in children with unilateral cleft lip or palate or both was found to be 22.2%. The frequency of supernumeraries in patients with cleidocranial dysplasia ranged from 22% in the maxillary incisor region to 5% in the molar region.⁶ While there is no significant sex distribution in primary supernumerary teeth, males are affected approximately twice as frequently as females in the permanent dentition.⁷

CLASSIFICATION

Supernumerary teeth have been classified mainly based on their morphology, location, form, and number. Mitchell² classified ST based on form - conical, tuberculate, supplemental, and odontoma, and based on location - mesiodens, paramolar, and distomolar. Schneier and Sampson⁸ classified ST based on form - conical, tuberculate, supplemental, and odontoma and based on location - mesiodens, paramolar, distomolar, and parapremolars. The mesiodens is located between the two central incisors and these are mostly in conical shape. Distomolars are located distally to the third molar, while paramolars are located palatally or labially next to a molar. However, ST classified based on morphology (conical, tuberculate, supplemental, and odontomes), location (mesiodens, paramolar, distomolar, and parapremolar), position (buccal, palatal, and transverse), orientation (vertical or normal, inverted, transverse, or horizontal). Yusof⁹ reported that 60.9% occurred in the mandible and among these 44.8% in the mandibular premolar region. Apart from the mesiodens, the majority of ST are reported in the maxillary incisor region (51.5%). In primary dentition, lateral incisor region is a common site of ST occurrence. A slight difference in the occurrence of ST in permanent dentition is relative frequency of difference in the literature. Shapira and Kufninec¹⁰ reported the order of frequency as being maxillary central incisors, molars, and premolars, followed by lateral incisors and canines. Single ST occurs in 76-86% of cases, double ST in 12-23% of cases and multiple ST in <1% (Figure 1).

PROBLEMS ASSOCIATED WITH SUPERNUMERARY TEETH

Displacement

Displacement of the crowns of the incisor teeth is a common feature in the majority of cases associated with delayed eruption.¹¹ The degree of displacement may vary from a mild rotation to complete displacement.

Pathology

Dentigerous cyst formation is another problem that may be associated with supernumerary teeth. Primosch reported

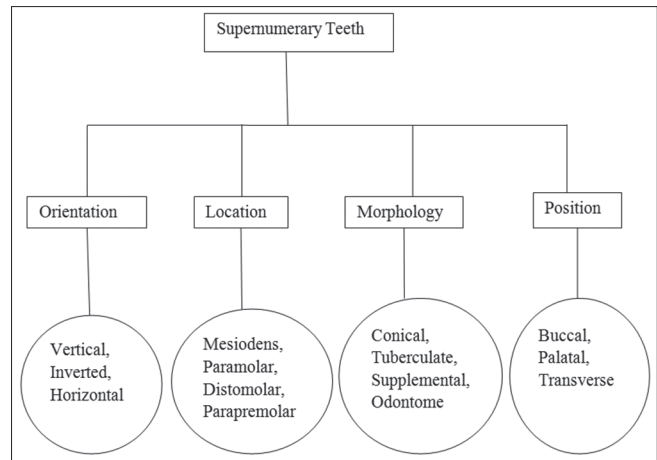


Figure 1: Classification of supernumerary teeth

an enlarged follicular sac in 30% of cases, but histological evidence of cyst formation was found in only 4-9% of cases.¹² Resorption of roots adjacent to a supernumerary may occur but it is extremely rare.

Failure of Eruption

The presence of a ST is the most common cause for the failure of eruption of a maxillary central incisor. It may also cause retention of the primary incisor. The problem is usually noticed with the eruption of the maxillary lateral incisors together with the failure of eruption of one or both central incisors. Supernumerary teeth in other locations may also cause failure of eruption of adjacent teeth.

Crowding

Erupted supplemental teeth most often cause crowding. A supplemental lateral incisor may cause crowding in the upper anterior region. The problem may be resolved by extracting the most displaced or deformed tooth.

Alveolar Bone Grafting

Supernumerary teeth may compromise secondary alveolar bone grafting in patients with cleft lip and palate. Erupted supernumeraries are usually removed and the socket site allowed to heal before bone grafting. Unerupted supernumeraries in the cleft site are generally removed at the time of bone grafting.

Cyst Formation

It has been reported that cyst formation due to ST was observed in 11% of the cases where dentigerous cyst is common type.

Root Abnormalities

Dilaceration is a developmental anomaly in the tooth shape and its structure, which may happen as sharp bending of the tooth in either the crown or the root portion. Loss of tooth

vitality has been reported in rare conditions.

Asymptomatic

Occasionally, supernumerary teeth are not associated with any adverse effects and may be detected as a chance finding during radiographic examination.

Diagnosis

It is essential to identify the presence of ST clinically and radiographically before a definitive diagnosis and management. Clinical complications such as midline diastema, displacement, delayed or failure of eruption, rotations, and impaction of teeth might leave a way of identification of ST. Identification and localization of ST are essential for the management if surgical intervention is needed. It has been reported that panoramic radiographs alone are not useful for the identification of ST. It has also been reported that combination of radiographs is necessary in localization of ST. Vertical tube shift and horizontal tube shift techniques are commonly used techniques for localization of ST.

MANAGEMENT OF SUPERNUMERARIES

Controversy exists regarding the optimal treatment of delayed eruption due to supernumerary involvement. The options include removal of the supernumerary only, removal of the supernumerary and orthodontic treatment to re-establish sufficient space for the delayed tooth, with or without surgical exposure of the unerupted tooth at the time of ST removal. Spontaneous eruption following supernumerary removal is suggested to be in the range of 54-75%. DiBiase¹² suggests that most teeth experiencing delayed eruption will spontaneously erupt within 18 months of supernumerary removal alone, providing the delayed tooth is not excessively displaced. Mitchell and Bennett¹³ studied spontaneous eruption following supernumerary removal only. 96 patients with 120 teeth exhibiting delayed eruption were studied. They found that 78% spontaneously erupted with a median time for eruption of 16 months. Only 14% required a second operation to expose the delayed tooth and this procedure was performed at a median time of 30 months following supernumerary removal. If adequate space was available, or was created early, the median time for spontaneous eruption was reduced. Timing of surgical removal of supernumerary teeth has also been contentious. Högström and Andersson⁶ suggested two alternatives exist. The first option involves removal of the supernumerary as soon as it has been diagnosed. This could create dental phobia problems for a young child and has been said to cause devitalization or deformation of adjacent teeth. Second, the supernumerary

could be left until root development of the adjacent teeth is complete. The potential disadvantages associated with this deferred surgical plan include; loss of eruptive force of adjacent teeth, loss of space and crowding of the affected arch, and possible midline shifts.

CONCLUSIONS

Supernumerary teeth are extra to normal complement in both dentitions. Males are predominantly affected by ST, which is common in permanent dentition. Supernumerary teeth may occur unilaterally or bilaterally, single or multiple, and at any region of the dental arch. It is important as a pediatric dentist to take appropriate measures at early ages to prevent or reduce orthodontic problems that could occur if the supernumerary teeth are not noticed. Early diagnosis and removal of supernumerary teeth allow to avoid or reduce possible complications.

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