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Mesiodens - etiology, prevalence, diagnosis and management

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Abstract

Introduction: Mesiodens is a supernumerary tooth located in the premaxilla between the two central incisors that causes a variety of dental problems such as impaired dentofacial aesthetics, malocclusion, and sometimes may lead to cyst formation. The prevalence of mesiodens ranges from 0.15 % to 1.9 %. The current literature review focuses on the etiology, prevalence, diagnosis and management of this problem.

Material and Methods: Several electronic data bases were selected. Hand searching was done to short list relevant articles. A total of 65 studies were initially retrieved out of which 53 relevant studies were selected for the review.

Results: Mesiodens is the most common type of supernumerary tooth that may cause impaired dentofacial esthetics and malocclusion. Males are more prone to be affected than the females.

Conclusions: Mesiodens is the most common reported type of supernumerary tooth occurring in permanent dentition. An in-depth evaluation of mesiodens would be helpful to develop significant clinical management of the affected patients

Keywords: Supernumerary teeth; Dental disturbances; Supplemental teeth

Introduction

Supernumerary tooth is defined as a developmental anomaly of number characterized by the presence of an extra tooth in addition to the normal dentition.[1] It can affect both maxilla and mandible; however, its occurrence in the mandible is rare. Supernumerary teeth usually occurs in permanent dentition and are rarely found to effect primary dentition.[2] It is the most common type of supernumerary tooth which may appear as single, multiple, unilateral or bilateral.[3,4] The exact etiology of mesiodens tooth is not clearly known. However, different theories have been established which include genetic and environmental factors,[5] syndromic conditions and disturbances in dental development.[6-8]

Material and Methods

The review of this literature was done based on the guidelines given in Pakistan Orthodontic Journal. Internationally published research literature, review articles and relevant citations were included. After the electronic literature search, a hand search of key orthodontic journals was undertaken to identify recent articles. The review was restricted to articles dealing with supernumerary teeth. Exclusion criteria included articles that did not follow the objective of this review and articles in a language other than English.

Results

A wide search of published articles was done using both the electronic database and hand searching. A total of 65 studies were retrieved initially. 52 studies having close relevance to the current study objective were used to express the review of literature for the mesiodens supernumerary teeth.

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Discussion

The prevalence of mesiodens ranges between 0.15% and 3.9% while few other sources reported between 0.09 and 2.05% in general population.[9-12] Mesiodens is considered to be the most common dental anomaly affecting permanent dentition and is rarely found in primary dentition.[13] In 80-90% of the cases it occurs in the maxilla and half of this percentage are found particularly in the anterior region.[14-15] The male population is more prone to be affected as compared to the female population (2:1).[16]

On the basis of its morphology, mesiodens can be classified as conical, supplemental and tuberculate type,[16] of which the conical form is the most prevalent.[17] They may be erupted or in some cases remain unerupted and cause malocclusion.[18]

As reported in the literature, some of the existing races exhibit a higher frequency of dental anomalies.[19] Mieghani[20] reported general prevalence of mesiodens to be 1.6% in Iranian children and males were found to be more affected than the female population (gender ratio of 2:1 in Iranian and 6.5:1 among the Hong Kong population respectively).[21,22]

The etiology of mesiodens tooth is not known; however, few theories have been suggested.[23] These include genetic[24] and environmental factors,[25] hyperactivity of the dental lamina and dichotomy of the tooth bud.[26] It may also occur in association with syndromes like cleft lip and palate, Cleidocranial dysplasia and Gardner's syndrome.[27]

Among these, the hyperactivity of dental lamina theory is considered to be the most acceptable etiologic factor in the development of mesiodens.[28]

The presence of erupted mesiodens is best diagnosed by clinical examination and the unerupted mesiodens can be diagnosed by both clinical and radiographic evaluation.[29] Panoramic, maxillary occlusal and periapical radiographs are recommended to assist the diagnosis of mesiodens and the bucco-lingual position of the unerupted mesiodens can be determined using parallax technique.[30] Early diagnosis of the entity helps to reduce the problems that might occur resulting in impaired esthetics and malocclusion.[31] Clinically, presence of unerupted mesiodens can be suspected in case if dental asymmetry or if delayed eruption of adjacent teeth exists.[32,33]

The classification of supernumerary teeth is usually based on their morphology.[34] According to the shape and size, the mesiodens teeth are classified as eumorphic that resembles to a normal sized central incisor and dysmorphic type that presents different shapes and sizes.[35-38]

Various complications might occur as a result of the presence of mesiodens, including delayed eruption, alteration in the path of eruption of permanent incisors, impaction of permanent incisors, crowding, spacing, median diastema, rotation and root resorption of the adjacent teeth or even eruption of incisors in the nasal cavity, cystic lesions and other intraoral pathological problems.[39-42]

Management of supernumerary teeth depends on the type, position of the tooth and the stage of dentition. Munns[43] recommended earlier removal of the mesiodens for achieving better prognosis. Extraction of mesiodens is usually not advocated in primary dentition since they often erupt into the oral cavity and thus risk of damaging the permanent incisor during surgical removal of mesiodens can be avoided.[44] However, at early mixed dentition stage, the permanent central incisors erupt spontaneously after the extraction of mesiodense.[45] This also promotes better alignment of the teeth and minimizes the need for orthodontic treatment.[46] Close monitoring of the dentition is required after the extraction of a mesiodentes.[47] Clinical and radiographic reassessment is recommended after 6 months of mesiodens extraction and if the permanent incisor does not erupt averagely after 12

months of extraction of mesiodens, closed eruption with orthodontic mechanotherapy is recommended.[48-51]

Delay in extraction of mesiodens might result in failure of spontaneous eruption of permanent incisor due diminished eruptive forces, arch perimeter loss, midline shifting and mesial drifting of lateral incisors into central incisor space, which might require comprehensive orthodontic treatment with surgical exposure of the unerupted teeth.[52] In order to avoid complications, the orthodontists recommend early removal of the supernumerary teeth.

Conclusions

Mesiodens is the most prevalent form of supernumerary teeth in permanent dentition that occurs as a result of genetic and environmental factors and hyperactivity of dental lamina. Males are affected two folds than the females. Early diagnosis of a mesiodens reduces the treatment required and prevents development of associated problems. Diagnosis of mesiodens can be done by clinical and radiographic examination and extraction of mesiodens in the early mixed dentition helps spontaneous alignment of the adjacent teeth. If the permanent incisors fail to erupt spontaneously, further surgical and orthodontic treatment may be required.

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