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RESEARCH ARTICLE

OCCLUSAL ANOMALOUS TUBERCLE IN THE MAXILLARY ARCH- A CASE REPORT AND REVIEW

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ABSTRACT

An accessory cusp-like structure seen protruding from the cingulum of anterior teeth labially or lingually is termed as occlusal anomalous tubercle or talon cusp and it is seen in primary or permanent dentition. This usually consists of enamel, dentin and a variable amount of pulp tissue. During morpho differentiation the hyperactivity of the enamel organ attributes to its formation.Talon cusps may causevarious problems like occlusal interferences leading to trauma, difficulty in cleaning the area between the nodule and thetooth leading to dental caries. A case with prominent occlusal anomalous tubercle in the maxillary arch is documented in this article.

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INTRODUCTION

Occlusal anomalous tubercle is defined as an additional or extra cusp that predominantly seen projecting from the lingual surface of primary or permanent anterior teeth which is morphologically well set forth, and extends from cement enamel junction (CEJ) to the incisal edge.[1]Occlusal anomalous tubercle is considered only when it extends at least one millimetre or more beyond the CEJ.[2] Mitchell first described this anomaly as a horn-like process from the CEJ to the incisal edge on the lingual surface of permanent upper central incisor. Dens evaginatus of anterior teeth was named by Mellor& Ripa as talon cusp as it resembled to an eagle's talon in shape.[3]This anomaly was termed with various names as interstitial cusp, odontoma of the axial core type, tuberculated premolar, evaginated odontoma, occlusal enamel pearl and supernumerary cusp, prominent accessory cusp-like structure, exaggeratedcingula, additional cusp, cusp-like hyperplasia, accessory cusp .[4,5] The first clinical case in the primary dentition was reported by Henderson in 1977[6]. The etiopathogenesis of this anomaly is multifactorial in origin which comprises of genetic, environmental and developmental aspects. During morpho differentation stage of tooth development there is an outward folding of inner enamel epithelial cells and transient focal hyperplasia of the peripheral cells of mesenchymal dental papilla.[2,7,8]The occlusal anomalous tubercle with other dental anomalies and familial involvement are genetic in etiology.[9] Occlusal anomalous tubercle comprises of normal enamel and dentin with varying degrees of pulp tissue histologically and the size may varyfrom a prominent cingulumto that of a cuplike structure extending to the incisal edge.[3] Inlarge talon cusps, especially when seen separated from the lingual surface of the tooth more likely to contain pulpal tissue.

[1] Clinically various problems are encountered with occlusal anomalous tubercle likeirritation of the tongue during speech and mastication, occlusal interference, carious lesion in the deep developmental grooves, displacement of the affected tooth, periapical pathosis, attrition of the opposing tooth,pulp necrosis, periodontal problems, pulp exposure due to severe attrition, restriction of tongue space, compromised aesthetics, problems in breast feeding, temporomandibular joint pain and accidental cusp fracture.[3.5]

Figure 1. Clinical picture showing talon cusp on palatal aspect of all permanent maxillary central Incisor

Figure 2. OPG showing talon cusp on palatal aspect of all permanent maxillary central Incisor

Occlusal anomalous tubercle presents as an isolated anomaly in majority of the cases seen, but may be also associated with mesiodens, odontome, unerupted or impacted teeth, peg-shaped maxillary incisor, dens invaginatus, cleft lip and distorted nasal alae, bilateral gemination, fusion and supernumerary teeth in few cases. Occlusal anomalous tubercle can be accompanied by some systemic conditions such as Mohr syndrome (orofacial- digital II), Sturge-Weber syndrome, Rubinstein-Taybi syndromeand Ellisvan Creveld syndrome.[5]Individuals with occlusal anomalous tubercle on a deciduous maxillary lateral incisor show a high proportion of odontogenic abnormalities in their permanent successors.[1] Radiographically occlusal anomalous tubercle looks like a Vshape radioopaque structure superimposed over the normal image of the crown. When the tooth is unerupted, radiographically it resembles mesiodens, compound odontoma, supernumerary tooth or a dens invaginatus. [2]Occlusal anomalous tubercle has been classified by Gazala, Usha, Paras & Nabeel as follows: Type 1- Talon / True talon, Type 2- Semi talon and Type 3- Trace talonbased on the extension of the talon cusp. Type A, B, C and D based on the surface and anomaly of the involved tooth.[10] Occlusal anomalous tubercle can cause complications in diagnosis by resembling a supernumerary tooth or an odontome leading to unwanted surgical intervention. It may also affect esthetics and function by causing occlusalinterference and difficulty in speech. It may also cause plaque retention due to the presence of deep developmental grooves.[5] The prevalence of occlusal anomalous tubercle was reported as 0.6% in a Mexican, 2.5% in a Hungarian, 5.2% in a Malaysian and 7.7% in an Indian population.[2,5] Extensive prevalence studies have not been performed but it is estimated that the frequency of occlusal anomalous tubercle might range from 1 to 8% of the population.[11]Hattab et al. reported a male to female ratio of 47:26 among 73 cases reported in the literature. Most reported cases of occlusal anomalous tubercle are located in the permanent dentition.[11,12]It may present unilaterally or bilaterally in males or females.[13]Occlusal anomalous tubercle occurs more frequently in permanent than primary dentitions and shows a predilection for the maxilla over the mandible.The maxillary lateral incisors are the most common targets (67%) followed by the central incisors (24%) and canines (9%).[3,9]However, the present case reports an unusual case of prominent occlusal anomalous tubercleaffecting on lingual surface of permanent maxillarycentral incisor, which is a rare finding.

Case report

A 12-year-old patient came with a chief complaint of mobile teeth in upper right and left back tooth region. On clinical examination patient had a class I molar relationship bilaterally with normal overjet and pink tooth in relation to 54 and 64. The oral hygiene maintenance was fair. The patient's family and medical history was non-contributory. There was no reported history of orofacial trauma. Extraoral examinations revealed no abnormalities. Intraoral examination revealed no soft tissue abnormalities. On hard tissue examination, an anomalous cusp like structure was detected on the palatal surface of permanent maxillary central incisor from cervical margin of the tooth to full length distance from the cementoenamel junction in relation to 11 (Figure 1). It was conicalin shape and prominent without any other associated anomaly. Patient was diagnosed with true talon cusp present on maxillary incisor. The talon cusp described in the current case was categorized as type I (True talon) according to Hattab et al's classification. Clinically maxillaryincisor with talon cusp was asymptomatic with little occlusal and no speech interference and responded normally to pulp testing. The grooves at the junction of cusp and the palatal surfaces of all maxillary incisor did not showstaining but revealed deep palatogingival groove with nodiscoloration (Figure 1). Orthopantomograph (OPG) also revealed anomalous cusp like structure extending from cervical margin of the tooth to full length distance from thecementoenamel junction with enamel dentin and little pulp (Figure 2). Retained deciduous teeth in relation to 53, 54, 55, 63, 64, 65, 74, 84,85. As there was no stagnation of food but inefficient in cleaning of the area, as a preventive approach, sealing of the cusp-tooth junctions in all maxillary incisor was planned. After prophylaxis of affected teeth, the cusp-tooth junctions were subjected to pit and fissure sealant to avoid penetration of irritants and microorganisms into the invagination. In future if it causes any occlusal interference, it will be reduced by grinding in consecutive

appointments and capping the exposed dentin with calcium hydroxide and resin.

DISCUSSION

Talon cusp has been noted to occur singly or bilaterally in the same patient. Rarely, two talon cusps may occur on a single tooth asreported by Abbot on a maxillary right central incisor.[14]While another report from Nigeria presented two palatal talons on a maxillary left central incisor.[15]However, presence of truetalon cusps in maxillary anterior teeth is a rarity, which is reported in the present case. Small talon cusps are asymptomatic and need no treatment. Usually, large talon cusps cause clinical problems.[9]Dental treatment is intervened only when problems inocclusion, speech or aesthetics are noted.[5]In the majority of cases reported, the talon cusp is isolated rather than an integralpart of any disorder. The present case was not associated with any known systemic developmental syndromes nor any dental anomalies on the same tooth. There was no positive family history contributing to the present case. The treatment of talon cusp depends on the presence or absence of pulp tissue.[16]The clinical scenario decides the treatment modality which ranges from no treatment to sequential grinding, pit and fissure sealants, pulp therapy, restorations, crowns and extraction.[17]Early recognition of this condition is essential to institute the right treatment.If the function and aesthetics are satisfactory, then no intervention is required.[18,19]It has been suggested to reduce the talon cusp by grinding in consecutive appointments of 4weeks apart and capping the exposed dentin with calcium hydroxide and resin.[3] Since the present case was asymptomatic and non- carious with presence of prominent palatal developmental grooves, as a prophylactic measure, these grooves were cleared of debris and plaque and sealed with pit and fissure sealant. Prophylactic treatment is considered as preferred mode of approach. Application of desensitizing agent containing 0.2% of sodium fluoride following gradual reduction, reduces sensitivity, stimulates reparative dentine formation and allows tooth to remain vital especially in permanent teeth with open apex. Further, it increases tooth resistance to acid dissolution, promotes remineralization and also inhibits the cariogenic microbial process.[20] Although talon cusp is a relatively rare odontogenic anomaly, it has clinical significance. In patients who undergo orthodontic treatment, complications of dentin-pulp complex exposure, posterior open bite on retraction of maxillary anteriors and interference during placement of any lingual brackets may pose.[3]

Conclusion

Intervention can be done at an early stage if it is recognised and diagnosed early.It is important for the paediatricdentist to be well prepared to carefully plan treatment of talon cusp, to avoid future problems.In case of severe occlusal interference, immediate removal of the cusp accompanied by pulp therapy such as root canal treatment or partial pulpotomy to be carried out.

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