

Case Report: Mandibular Talon Cusp Associated With Molar-Incisor Hypomineralization and Delayed Tooth Eruption



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Citation: Salem K, Moazami F, Banijamali SN. Mandibular Talon Cusp Associated With Molar-Incisor Hypomineralization and Delayed Tooth Eruption. Journal of Dentomaxillofacial Radiology, Pathology and Surgery. 2018; 6(4):141-145.



Funding: See Page 144

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Article info:

Received: 25 Aug 2017

Accepted: 20 Nov 2017

Available Online: 01 Jan 2018

Keywords:

Talon cusp, Molar-Incisor hypomineralization, Delayed eruption, Dental anomaly

ABSTRACT

Talon cusp is an odontogenic anomaly in anterior teeth, caused by hyperactivity of enamel in morphodifferentiation stage. Talon cusp is an additional cusp with several types based on its extension and shape. It has enamel, dentin, and sometimes pulp tissue. Moreover, it can cause clinical problems such as poor aesthetic, dental caries, attrition, occlusal interferences, and periodontal diseases. Therefore, early diagnosis and effective treatment of talon cusp are essential. Maxillary incisors are the most commonly affected teeth. However, occurrence of mandibular talon cusp is a rare entity. We report a talon cusp in the lingual surface of the permanent mandibular left central incisor, in a 7-year-old Iranian boy. To our knowledge it is the third case reported in Iranian patients. Also in this case, molar-incisor hypomineralization in permanent mandibular first molars and permanent incisors as well as delayed eruption of permanent maxillary left central incisor were observed. So far, there is no report about talon cusp with this type of developmental defect.

1. Introduction

In 1892, a morphological anomaly was described for the first time on anterior teeth by Mitchel WH [1], and Mellor Spanish used the term of talon cusp for this anomaly in 1970 [2]. Talon cusp (dens evaginatus) is an odontogenic anomaly of the anterior teeth [3]. It is placed in the form of additional cusp on the lingual or buccal aspects of teeth [3, 4]. Talon cusp derives from CEJ and both series of primary and permanent dentition maybe affected

[3-5]. Histologically, talon cusp includes enamel, dentin, and sometimes pulp tissue [5, 6].

The reported prevalence is 0.06% to 7.7% [7, 8]. It occurs more often in men. In the most cases, it is unilateral [9]. Talon cusp is more frequently observed in permanent teeth than in primary dentition [10, 11]. Maxillary lateral incisor is the most common tooth effected by talon cusp [7, 12-14]. Its occurrence is more on the left side of the mandible than right. The highest associated anomaly with the permanent mandibular talon cusp

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is double tooth [14-16]. Mandibular talon cusp is rare entity. Among Iranian population, only two cases have been reported [17, 18].

2. Case Presentation

A 7-year-old boy attended the Outpatient Department of Dentistry affiliated to Islamic Azad University, Tehran, Iran, for a routine dental examination. In medical history evaluation, his mother reported that the child had chickenpox when he was 7 months old. In intra-oral examination, a prominent bulge in the form of additional cusp was found on the lingual surface of permanent mandibular left central incisor (Figure 1).

The extension of this prominence was from Cementoenamel Junction (CEJ) to incisal edge. Signs of occlusal interference and attrition were not observed in the talon cusp. Cusp grooves were deep but without decay. Gingival tissue was normal. Dentin hypersensitivity was not reported. In radiographic view, radiopacity was as inverted V-shaped structure superimposed on the left mandibular central incisor. The extension of pulp tissue into the talon cusp was not detectable (Figure 2).

Also delayed eruption of permanent maxillary left central incisor was observed. Radiographic examination depicted asymmetry in the position of maxillary permanent central incisors (Figure 3). Moreover, in permanent mandibular first molars and permanent maxillary and mandibular incisors, enamel defects in the form of Molar-Incisor Hypomineralization (MIH) were detected (Figure 1). A preventive approach to talon cusp treatment was considered. Deep developmental grooves of talon cusp were cleaned with a slurry of pumice, and then pit-and-fissure sealant was implemented to seal the grooves.

3. Discussion

In this article, we reported a case of talon cusp in the lingual surface of the mandibular left central incisor. To our knowledge, it is the third such report in an Iranian patient [16, 17]. Different etiologies have been expressed for this anomaly. Hyperactivity of dental lamina, altered endocrine functions, hyperplastic dental papilla, and genetic and environmental factors may be responsible [6, 18].

Extension of talon cusp in cervico-incisal length of tooth, is different. In 1996, Hatab divided it into 3 types. Type I, the additional cusp that extends at least 50% of the cervico-incisal length of the tooth (talon); type II, the additional cusp that extends 25%-50% of the tooth length (semitalon); and type III, a prominent cingulum,

that extends less than 25% of the tooth length (trace talon) [13]. In radiographic examination, detection of the pulp extension into the cusp is difficult because of superimposition of cusp on pulp chamber, especially when talon cusp is huge [2, 19, 20].

According to this classification, our case was diagnosed as type I. Generally, in radiographic view, talon cusp in the maxilla is characterized by V-shaped opacity and in the mandible, by a typical inverted V shaped opacity superimposed on the tooth. The appearance of this opaque structure can be different depending on the shape, size, and cusp angle [2, 19]. In this case, radiographic exam showed superimposition of inverted V-shaped opaque structure on the left mandibular central incisor. Pulp conflict and its entry into the talon cusps were not detectable.

Talon cusp may cause clinical and aesthetic problems, attrition, occlusal interference and then periodontal problems, interference with tongue space, irritation of tongue, cusp fracture, displacement of the tooth, Temporomandibular Joint (TMJ) pain, and developmental grooves on the talon that increases caries susceptibility [18, 19]. Also, in infants, talon cusp in primary tooth can cause breastfeeding problems [20]. Therefore, early diagnosis and effective treatment of talon cusp are essential. In our case, dentin hypersensitivity was not reported. Signs of attrition and occlusal interferences were not observed between the added cusps and tooth. Cusp grooves were deep but without decay. Gingival tissue was normal.



Figure 1. Talon cusp projecting on the lingual surface of the crown of mandibular left central incisor and MIH in permanent mandibular first molars and permanent maxillary and mandibular incisors

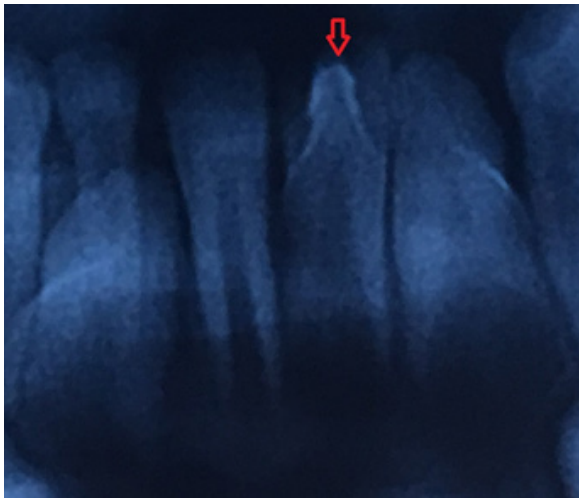


Figure 2. Inverted V-shaped radiopaque structure, superimposed over the crown of the mandibular left central incisor

Different treatment plans have been advocated to management talon cusp case by case. When grooves of cusp are without caries, fissure sealant is recommended. If grooves have decay, but pulp involvement is not evident, caries removal and placing GI or composite filling are recommended. In cases with occlusal interference between talon cusp and apposing tooth in other jaw, gradual grinding over several consecutive appointments (over 6 to 8 weeks) is recommended [21].

This approach will cause deposition of reparative dentin to protect the pulp. In each visit, after grinding, covering the tooth surface with dental desensitizing agents (potassium nitrate and fluoride) is performed [8, 9, 18]. Total cusp reduction if needed, pulpotomy and placing calcium hydroxide are performed, and in severe cases, root canal therapy is advised. When talon cusp causes displacement or malalignment of the tooth, orthodontic treatment may be indicated [7, 8, 10, 18].

In this case, talon cusp did not have decay and other clinical problems, so the grooves of talon cusp with a slurry of pumice were cleaned; then they sealed with pit-and-fissure sealant. As a result, we prevented future problems with immediate diagnosis and treatment. Additional findings in the presented case were Molar-Incisor-Hypomineralization (MIH) in permanent mandibular first molars and permanent incisors and delayed eruption of permanent maxillary left central incisor.

MIH results in enamel defects in one to four molars, and often the permanent incisors [22]. In 2013, Fagrell et al. estimated that the time for the disturbance in mineralization of the teeth was around the first 6–7 months

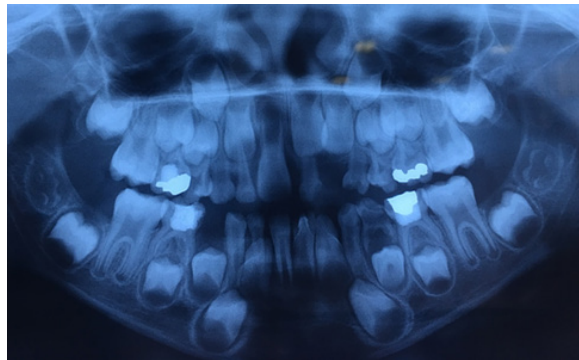


Figure 3. Asymmetry in position of maxillary permanent central incisors

of age [23]. The mineralization timing of permanent first molars and permanent incisors seems to overlap. About the first permanent molar, the beginning of formation of hard tissue is from birth and completion of enamel which lasts up to 2.5-3 years. This timing in permanent incisors are respectively 3-4 months and 3.5-4.5 years old [24].

Etiology of MIH has been a controversial subject in the literature. Systemic conditions and environmental factors can influence prenatal, perinatal, and postnatal development of teeth. In prenatal period, maternal diseases such as viral infections, hypertension, diabetes, and medication can cause MIH. Occurrence of premature birth or low birth weight in perinatal stage can induce hypomineralization of enamel. Chronic childhood diseases (respiratory infection, asthma, bronchitis, otitis), other diseases with high fever such as chickenpox, and medication are postnatal medical problems that may be associated with MIH defects [25-28].

In our case, catching chickenpox in 7 months age, can be a contributing factor for MIH [27, 28]. Now, this question poses, whether chickenpox, besides its effect on amelogenesis, can affect morphodifferentiation stage of tooth development. So far, there is no report about cooccurrence of talon cusp with MIH and delayed eruption. As a result, in case of detecting any dental anomalies, it is advocated to have a comprehensive investigation of whole dentition by precise clinical and radiographic examination.

4. Conclusion

Mandibular talon cusp is rare. Occurrence of MHI and Delayed Tooth Eruption (DTE) associated with talon cusp have not been reported before. Our case report attempts to highlight their unusual cooccurrence. It is important for dentists to knowledge dental developmental defects. As a

sign of other dental anomalies, immediate diagnosis and appropriate treatment can reduce possible complications.

Ethical Considerations

Compliance with ethical guidelines

The patient was aware of all the research process. In the end, all the clinical photographs, and radiographic findings were published with permission of the patient.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest

The authors declare no conflict of interest.

Acknowledgements

We acknowledge the patient for his cooperation and consent to publication of case history, clinical photograph, and radiographic finding.

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