

Labial Talon Cusp on Maxillary Central Incisors: A Rare Developmental Dental Anomaly

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ABSTRACT

Labial talon cusp, or dens evaginatus is a very rare dental anomaly of unclear etiology and significance. It can occur as an isolated finding or be associated with other dental anomalies or some syndromes. The present report describes two Caucasian males with labial talon cusp on maxillary permanent left central incisors. In both cases accessory cusp caused plaque accumulation and marginal gingivitis. One case displayed affected tooth to be in cross bite position causing occlusal trauma. No other dental anomalies in either case, neither association with some syndromes were noted. This rare anomaly requires careful dental and physical examination of the affected patient since its finding can be of clinical and genetic significance.

Key words: labial talon cusp, dens evaginatus, dental anomalies

Introduction

Talon cusp is usually defined as an accessory cusp-like structure resembling an eagle's talon in shape. It projects incisally from the cingulum area of the incisors and consists of enamel, dentin and pulpal tissue¹⁻³. The pulp chamber in some cases follows the morphological variation of the tooth crown^{4,5}. Gorlin and Goodman⁶ defined talon cusp as a high accessory cusp reaching the incisal edge to produce a T-form or a Y-shaped tooth crown. The conventional definition of talon cusp was considered only an accessory cusp projecting incisally from the cingulum area of an incisor. The current definition of talon cusp includes accessory cusp on the lingual or labial aspect of incisors or canines^{7,8}.

The prevalence of talon cusp is estimated to range from 0.25% in American children⁹ to 6.9 % in North Indian children¹⁰. The anomaly is much more frequent in permanent than in primary dentition. About 75 % of talon cusp occurs in permanent dentition and 25 % of cases appear in primary dentition³. The maxillary lateral incisors are most often affected (67 %), followed by the central incisors in 24%, and canines in 9 %. Epidemiological surveys have shown that the anomaly is more frequent in certain populations, such as the Chinese and Arabs^{11,12}.

Talon cusp has been associated with other dental anomalies such as dens invaginatus, impacted teeth, su-

pernumerary teeth, root abnormalities and odontomas¹³⁻¹⁵. In a few cases a tooth with both a labial and palatal talon cusp have been described^{15,16}. Association with some genetic syndromes has been also recorded. It may accompany syndromes such as Mohr's, Rubinstein-Taybi, Sturge-Weber and incontinentia pigmenti^{2,15,17,18}. In a sample of 45 patients with Rubinstein-Taybi syndrome Hennekam and Van Dorne established that talon cusp affects permanent dentition in 92 % of cases¹⁹.

The etiology of talon cusp seems to be a combination of genetic and environmental factors^{2,20}. Occurrence of the anomaly in sibs and members of the same family^{21,22}, patients from consanguineous marriages³, in twins²³, and some genetic syndromes¹⁵⁻¹⁹ supports genetic etiology of the condition.

The anomaly may cause some clinical problems and requires prevention and treatment. Most frequently it is associated with occlusal trauma and periodontal problems^{15,24}. There are only a few literature reports of labial talon cusps in children^{7,8,17}.

The purpose of this article is to document two new cases of labial talon cusp on maxillary central incisors as a very rare dental anomaly. The treatment procedure by sequential grinding and composite build-up of tooth crown is also described.

Case Reports

Case 1

The patient, a 7-year-old Croatian boy was referred to the Department of Paediatric Dentistry, School of Dental Medicine, University of Zagreb. The parents expressed concern about the abnormal shape of the left



Fig. 1. Labial talon cusp on the maxillary left central incisor. The cusp extended from the cervical region to the incisal edge.



Fig. 2. Occlusal view of the affected central incisor (mirror image).



Fig. 3. Facial view showing left maxillary central incisor in crossbite position.

maxillary central incisor. Their main complaint was abnormal tooth shape and impaired aesthetics.

Intra-oral examination revealed well-defined accessory cusp on the labial surface of the maxillary permanent left central incisor (Figure 1). The accessory cusp was pyramidal in shape and extended from the gingival margin to the incisal edge. It was located in the medial half of the crown and completely attached to it. The developmental grooves were pronounced between the cusp and labial surface of the crown (Figure 2). The affected tooth was in crossbite position, and the accessory cusp was interfering with occlusion (Figure 3). No carious lesions, deep periodontal pockets, spontaneous or percussion pain were associated with the affected tooth. All other incisors, as well as all other teeth did not show any developmental abnormalities. The parents had no knowledge of similar anomalies in either of the dentitions of any other family members. The primary maxillary incisors were normal in shape and size. Intra-oral and extra-oral examinations of the patient did not reveal any abnormalities of soft and hard tissues.

The thermal vitality test revealed normal pulp response. A periapical radiograph was taken and revealed widely open apices of the central incisors and incomplete root development. In the crown region a V-shaped radiopaque structure was superimposed in the central part of crown, and pointed towards the incisal edge (Figure 4). The second radiograph taken 2 years later confirmed almost complete root development and clear V-shaped projection of the accessory cusp. Orthopantomogram showed the presence of all permanent teeth in both jaws, including the germs of third molars. No association with other dental anomalies was established.

Therapeutic procedure included gradual grinding of the talon cusp with a fine diamond burr and aesthetic correction with composite material. After each grinding session fluoride varnish was applied (Fluor protector) to



Fig. 4. Periapical radiograph showing talon cusp as a V-shaped radiopaque structure superimposed on the image of the affected tooth crown.



Fig. 5. A prominent talon cusp on left maxillary central incisor projecting out at about a 45 degrees from labial surface: A) labial view, B) occlusal view (mirror image).

protect the exposed dentine and pulp tissue. Interceptive orthodontic therapy was applied to bring the affected tooth into the normal position from its cross-bite position.

Case 2

An eight-year-old boy was referred to the Department of Pediatric Dentistry for treatment of a left maxillary central incisor with unusual accessory cusp on its labial surface. The patient had no other medical or dental problems. Family history did not reveal the existence of similar anomalies in any other family member. Existing and previously exfoliated primary teeth were all normal in shape and size. Intraoral examination revealed a well-developed cusp on the labial surface of the left maxillary central incisor. The talon cusp was markedly developed and had a pyramidal shape. It was pointed towards the incisal edge with detached tip, reaching the middle of the labial surface. The attached part of the cusp was confined to the cervical third of the crown (Figure 5 A and B). Both maxillary central and lateral incisors were fully erupted. This labial evagi-

nation was causing problems in maintenance of oral hygiene and slight gingival inflammation.

Radiographic examination showed complete apexogenesis of both maxillary central incisors. On the crown of the left central incisor a clearly marked V-shaped radiopaque structure was observed in the central part. It was pointed towards the incisal edge. Contours of the pulp chamber did not follow the talon cusp morphology.

Management procedure included gradual grinding of the talon cusp. By applying sequential grinding procedures it was possible to remove the talon cusp completely without pulp exposure. Finally, composite build up of the tooth crown was used to achieve aesthetic reconstruction (Figure 6).

Discussion

As a developmental dental anomaly talon cusp usually occurs on the palatal surfaces of upper permanent incisors, projecting from the cingulum area to the incisal edge. Schulze describes its extension as at least half the distance from the cemento-enamel junction to the incisal edge²⁵. Extension of the pulp chamber into the accessory cusp has been noted in some cases but its presence is difficult to establish even radiographically^{7,26}.

Etiology of talon cusp is not clear. Formation of this anomaly occurs during morphodifferentiation stage. It is suggested that its formation may be a result of upward folding of the inner enamel epithelial layer and transient focal hyperplasia of the mesenchymal dental papilla³. According to another opinion the formation of talon cusp may be due to hyperproductivity of the anterior ends of dental lamina²². It is considered that talon cusp can originate as a result of the interaction of genetic and environmental factors^{2,20}. The genetic etiology suggests finding of the anomaly in sibs and member of the same family^{21,22}, in patients from consanguineous marriages³, in twins²³, and some genetic syndromes^{15–19}.

The appearance of talon cusp on the labial surface of the tooth is attributed to the hyperplasia of labial cen-



Fig. 6. Labial view of left central incisor after completed treatment.

tral developmental lobe²⁷. The frequency of the condition varies widely in different population groups. Very low frequency was observed for American children (0.25 %)⁹, while in Chinese and Arab populations it is considerably higher (6.9 %)³,¹¹,¹². It also affects permanent dentition three times more than primary dentition^{2,3}. Males are affected twice as much as females². Analysis of dental anomalies in children with developmental disorders did not revealed presence of talon cusp in either group^{28–30}.

The cases described in the present study represent a very rare form of labial talon cusp on left permanent central maxillary incisors. There was no data on affected family members or consanguinity of the patients' parents. Other dental anomalies were not observed in any of the analyzed patients. Primary teeth in both cases were normal in size and shape, with normal exfoliation rate. Patients were well-developed boys without any other developmental abnormalities. There were no signs or symptoms of any genetic syndromes. For these reasons the findings of labial talon cusp in both cases should be considered as isolated developmental abnormalities.

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The main clinical problems associated with talon cusp were altered aesthetic, occlusal interface, displacement of teeth, plaque retention in lateral cuspal grooves and potential risk of caries and periodontal disease.

The treatment approach in such cases usually includes gradual reduction of the cusp, composite build up and preventive sealing of the grooves along the cusp. Before complete cusp reduction a preventive sealant can be placed in developmental grooves. In the present cases we applied gradual grinding of the talon cusp to avoid possible exposure of the pulp chamber. After grinding a composite build-up was applied to achieve appropriate aesthetic outcome.

In conclusion, labial talon cusp represents a rare dental anomaly, often associated with other anomalies and some genetic syndromes. Its finding requires thorough examination of the patient and early treatment approach to avoid possible complications such as occlusal trauma, caries development or periodontal problems. Further studies are necessary to clarify additional associations of talon cusp with other anomalies and to elucidate the etiology of this rare developmental anomaly.

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LABIJALNA PANDŽASTA KVRŽICA NA SREDIŠNJEM GORNJEM SJEKUTIĆU: RIJETKA RAZVOJNA DENTALNA ANOMALIJA

S A Ž E T A K

Labijalna pandžasta kvržica ili *dens evaginatus* je vrlo rijetka dentalna anomalija nejasne etiologije i značenja. Ona se može pojaviti kao izoliran nalaz ili biti povezana s drugim dentalnim anomalijama ili nekim sindromima. Ovaj rad opisuje dva dječaka s labijalnom kandžastom kvržicom na maksilarnom trajnom lijevom središnjem sjekutiću. U oba slučaja dodatna kvržica je uzrokovala nakupljanje plaka i marginalni gingivitis. U jednom slučaju zahvaćeni zub je bio u obrnutom preklopu i uzrokovao je okluzijsku traumu. Niti u jednom slučaju nisu zapažene ostale dentalne anomalije niti povezanost s nekim sindromima. Ta rijetka dentalna anomalija zahtjeva pažljiv dentalni i tjelesni pregled zahvaćenog pacijenta jer njen nalaz može imati kliničko i genetsko značenje.