Labial and Lingual Talon Cusps of a Primary Lateral Incisor: A Case Report

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Abstract

Talon cusp occurs as a result of disturbances during the morpho-differentiation stage of tooth development. It is more common on the palatal surface of the permanent maxillary incisors. It can be unilateral/bilateral, but can also occur on the same tooth. Only 2 published reports exist documenting talons on both labial and lingual surfaces of the same tooth in permanent incisors. The purpose of this case report was to present a rare case of a facial and palatal talon cusp on the primary maxillary right lateral incisor in a 5-year-old girl with bilateral cleft lip. In this case, the morphology of the primary incisor was "+" shaped on occlusal view. (Pediatr Dent 2005;27:303-306)

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Talon cusp is an unusual cuspal projection from an anterior tooth with normal enamel and dentin containing varying degrees of pulp tissue.[1] Other synonyms include dens evaginatus, occlusal enamel pearl, and supernumerary cusp, of which dens evaginatus is used for both anterior and posterior teeth.[2] Talon cusp was first recorded by Mitchell in 1892. She described this accessory cusp on the lingual surface of a maxillary central incisor as "a process of a horn-like shape curving from the base downward to the cutting edge" in a female patient.[3] Mellor and Ripa named this condition "talon cusp" because of its resemblance to an eagle's talon.[4]

Shulze defined talon cusp as a very high accessory cusp, which may connect with the incisal edge to produce a "T" form or a "Y"-shaped crown contour.[5] Mader in 1981 and Davis in 1986 redefined this entity as "a morphologically well-delineated cusp that projects from the lingual surface of the primary or permanent anterior tooth and extends at least half the distance from the cementoenamel junction to the incisal edge."[6,7]

The prevalence of talon cusp varies with race, age, and the criteria used to define this abnormality. A prevalence of 0.17% in the United States, 0.06% in Mexico, 5.2% in Malaysia, and 7.7% in the north Indian population have been reported.[8-11] A review of the literature suggests that 75% of the cases are in the permanent dentition and 25% in the primary dentition.[12] This anomaly has a greater predilection in the maxilla (with more than 90% of the cases reported) than in the mandible (only 10 % of the cases).[13] In the permanent dentition, 55% of the cases involved maxillary lateral incisors, 33% involved central incisors, and 4% involved canines.[2]

Tsutsumi et al, Jowharji et al, and McNamara et al reported cases with facial talon cusp.[14-16] Abbott and Dunn reported cases of both labial and palatal talon cusps on the same maxillary permanent incisor.[17,18] Salama and Nadkarni have reported talon cusp on a supernumerary tooth.[19,20]

The first report of a talon cusp in the primary dentition was in 1977 by Henderson.[21] Since then, numerous cases have been reported in the literature, some of which were bilateral talon cusps.[13] Chin-Ying et al reported 2 more cases of bilateral talon cusp in primary central incisors.[22] Recently, Tsai and Chang and Tiku et al have reported cases of talon cusp in primary incisors.[23,24] This article presents the first reported case of both labial and palatal talon cusps on a single primary tooth.

Case report

A 5-year-old girl was referred to the Cleft Lip and Palate Department in Meenakshi Ammal Dental College and Hospital with a chief complaint of bilateral cleft lip. She was brought to the Department of Pedodontics and Preventive

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Dentistry for a routine dental checkup. On examination, she had an incomplete bilateral cleft lip. Intraorally, a malformed primary maxillary right lateral incisor (Figure 1) and mesio-occlusal caries in the ipsilateral primary maxillary first molar were seen (Figure 2). Upper and lower alginate impressions were made, and a study cast was prepared.

The morphology of the primary maxillary right lateral incisor was unique. The tooth was "+" shaped when viewed occlusally (Figure 2). The mesiodistal and the labiolingual diameter were 7.85 mm and 7.3 mm, respectively. This was more than the usual mesiodistal (5.1 mm) and labiolingual diameter (4.0 mm) for a lateral incisor.[25] The mesiodistal diameter of a contralateral lateral incisor was 7.2 mm, and the labiolingual diameter was 4.7 mm. Both lateral incisors were larger than the central incisors, which measured 6.5 mm mesiodistally. These measurements were taken from the study casts using a Dentagauge 2 (Erskine Dental, NSW, Australia).

In this patient, the primary maxillary right lateral incisor had 2 prominent projections: one on the labial aspect and the other on the palatal aspect. The presence of a deep developmental groove where the accessory cusp joins the labial or lingual surface was not seen on either side of these projections. Due to occlusal interference, the ipsilateral mandibular lateral incisor was 2 mm below the occlusal plane. An intraoral periapical radiograph of the tooth revealed an inverted, well-defined "v" shaped projection, with the pointed end of the "v" toward the incisal edge and a small projection. The film revealed that pulp extended into the talon projection. The morphology of the underlying permanent lateral incisor showed some variation in shape.

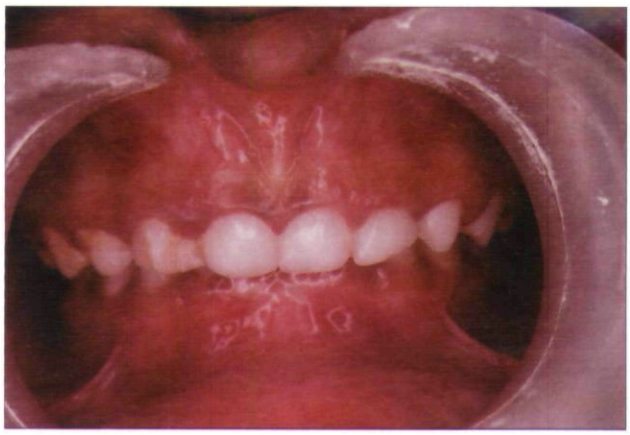

Figure 1. Malformed maxillary right primary lateral incisor (labial view).

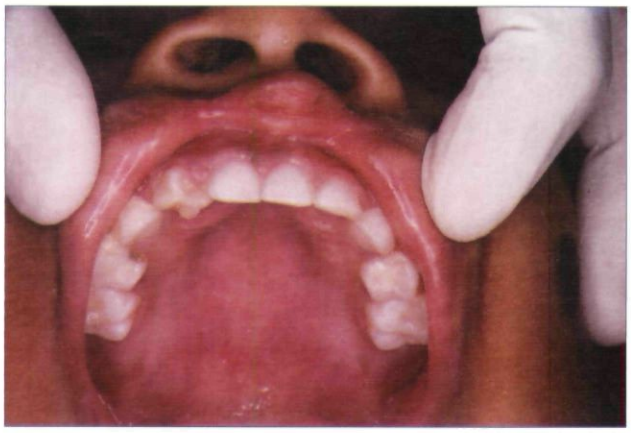

Figure 2. "+" shape of the maxillary right primary lateral incisor and mesio-occlusal caries in the maxillary right primary first molar (occlusal view).

Oral prophylaxis was performed, and the disto-occlusal caries was removed and filled with glass ionomer cement. Fluoride varnish (Bifluorid 12; Voco chemi GmbH, Cuxhaven, Germany) was applied, and oral hygiene instructions were given. Two days later, the patient's cleft lip was surgically repaired. The patient was asked to report after 3 months for review.

Discussion

The exact etiology of this condition is unknown. Hattab et al suggested that the anomaly might occur because of outfolding of the enamel organ.[13] Hyperactivity of the dental lamina has been considered as an etiological factor.[26] Sicher and Bhasker suggested that disturbances during the morphodifferentiation stage (eg, altered endocrine function) might affect the tooth's size and shape.[27] The susceptibility of maxillary lateral incisors may be due to the compression of the tooth germ in the morphodifferentiation stage from the adjacent central incisor and canine, which develops 7 months earlier than the lateral incisor.[28] This compression can result in outfolding of the dental lamina. This cannot be the cause of talon cusps in primary teeth, as all the incisors start developing at the same time and the canine develops after the lateral incisors mature.

In addition, most of the talon cusps of the primary teeth involve maxillary central incisors. It is generally believed that the cause could be due to a combination of genetic and environmental factors.[12]

The incidence of morphological variations in the lateral incisors is higher in children with cleft lip and palate.[29] This is due to the tooth's close proximity to the cleft, as they are formed before the tooth develops. Luciana et al studied the shape of the cleft side lateral incisor in 203 patients of unilateral cleft lip and palate and reported that the most frequent shape was conical.[30] In a study of anomalies in the deciduous dentition of cleft lip and palate children, Poyry and Ranta found that congenitally missing, peg-shaped, and fused teeth were more common.[31] Dahllof et al found enamel hypoplasia, enamel hypomineralisation, hypodontia, and supernumerary teeth to be more common in cleft patients than the control group.[32]

Cabete et al evaluated the primary dentition in cleft lip and palate children with and without natal/neonatal teeth and reported that extraction of them did not alter the final complement of primary teeth.[33] The most common dental anomalies in patients with cleft lip alone were found to be the presence of supernumerary teeth that decreases as the severity of cleft increases, whereas the reverse is ap-

plicable to the incidence of malformations or aplasia of teeth.[34,35]

Mader has suggested that the term "talon cusp" could be applied when anomalous cusps project from the lingual surface of the permanent tooth and extends at least half the distance from the cementoenamel junction to the incisal edge.[6,36] This distinct morphology of the present case, however, does not fulfill Mader's criteria, as it is seen on the primary teeth.

Hattab et al classified anomalous cusp into 3 types, based on the height of the projection.[26] He refers to type 1 talon cusps as well-delineated projections from the palatal surface of primary or permanent anterior teeth and extending at least half the distance from the cementoenamel junction to the incisal edge. If the projection is small, extending less than half the distance from the cementoenamel junction to the incisal edge, they are referred to as type 2 semi-talon cusps. Type 3 trace talon cusps are prominent cingula, which vary in shape (conical, bifid, or tubercle). The talon cusp on the palatal surface of this case belongs to the type 1 trace talon group.

The occurrence of facial talon cusps was reported in many cases, which was not classified by Hattab et al.[26] Chin-Ying[22] described the variations in talon cusps as:

1. **major talons:** well-delineated cusps that project from an anterior tooth's facial or palatal/lingual surface and extends at least half the distance from the cementoenamel junction to the incisal edge;
2. **minor talons:** which occur on the same surfaces, but extend more than one fourth and less than half the distance from the cementoenamel junction to the incisal edge;
3. **trace talons:** enlarged prominent cingula and their variations, which occupy less than one fourth the distance from the cementoenamel junction to the incisal edge.

The present case does not fulfill these criteria, as both facial and palatal cusps were present on the same tooth. If the individual cusps are accounted for, however, the facial talon cusp is considered a type 1 major talon cusp and the palatal cusp is a type 3 trace talon cusp.

Abbott and Dunn reported similar cases, with both facial and palatal talon cusps in the permanent maxillary incisor.[17,18] The morphology of this was similar to the present case.

As there are reports of a tooth with both facial and palatal talon cusps, the authors suggest a modified definition of talon cusps—one that describes them as cusp-like projections from the facial and/or palatal/lingual surfaces of an anterior tooth.

Talon cusp is also associated with other skeletal and dental anomalies, including peg-shaped lateral incisors, unerupted canines, mesiodens, supernumerary teeth, megadont, dens evaginatus, cross-bite, retrognathic mandible, hypodontia, complex odontoma, and impaction.[6,7,12,37,38] No such anomalies were present in this case.

The incidence of talon cusp increases when associated with syndromes like Rubinstein-Taybi syndrome, orofacial digital syndrome II (Mohr syndrome), Sturge-Weber syndrome, incontinentia pigmenti achromians, and Ellis-van Creveld syndrome.[14,17,39-42] No such syndromes were seen in this patient, except for the presence of bilateral incomplete cleft lip.

The most common problems associated with talon cusp are occlusal interference, displacement and rotation of teeth, dental caries, periodontal problems, tongue irritation during speech and mastication, and compromised esthetics.[6,7,15,36,43] In the present case, the patient had compromised esthetics due to the facial talon and occlusal interference caused by palatal talon cusp.

The various treatment options for talon cusp are:

1. gradual, periodic reduction of the cusp;
2. application of fluoride or desensitizing agents;
3. restoring tooth morphology or complete removal of tooth.[4,15,36,43,44]

If pulpal exposure occurs during the former treatment, endodontic treatment should be done. The authors could not carry out any treatment for this tooth, as the parents were more concerned about their child's unaesthetic appearance due to cleft lip than the compromised esthetics due to the talon cusp. Even though caries-susceptible grooves were not seen on this tooth, fluoride varnish was applied and oral hygiene instructions were given as preventive measures. The patient was advised to seek a periodic review every 3 months.

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