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ORIGINAL ARTICLE

Facial talon cusp in primary maxillary lateral incisor: A report of two unusual cases

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Abstract
Talon cusp is an uncommon dental anomaly in which an accessory cusp-like structure projects from the cingulum area or cemento-enamel junction of the maxillary or mandibular anterior teeth. This anomalous cusp resembles an eagle's talon. It occurs in both the primary and the permanent dentition. A comprehensive literature review shows that only 37 cases of talon cusps have been reported in the primary dentition, of which only 4 cases report this anomaly on the primary maxillary lateral incisor. Though labial/facial talon cusps have been reported in the permanent dentition, no case of a labial talon has been reported in the primary dentition. We report two females with cleft lip and palate with facial talon cusps on the primary lateral incisor and believe that these are the first cases to be reported. Clinical considerations and debate on the etiology of this anomaly are discussed.

Key Words: *Lateral incisor, primary dentition, talon cusp*

Introduction

Mitchell [1] was the first to describe a talon cusp in an upper central incisor of a woman as "a process of horn like shape curving from the base downwards to the cutting edge". Mellor & Ripa [2] named the accessory cusp as "talon" because of its resemblance in shape to an eagle's talon. Talon cusp is defined as an uncommon dental anomaly in which an accessory cusp-like structure projects from the cingulum area or cemento-enamel junction of the maxillary or mandibular anterior teeth [3]. This anomalous cusp is composed of enamel and dentin and may or may not contain pulpal tissue [4]. The anomaly occurs in both primary and permanent dentition [3].

There is insufficient data regarding the true prevalence of this anomaly. The frequency of its occurrence for various world populations ranges from 0.06% to 7.7% [5]. The talon cusp is present more frequently in males compared to females [6]. The occurrence of talon cusp in the permanent dentition is believed to be three times higher than the primary dentition [7]. Reports on the lingual location of talon cusp are many, but few cases have been reported with a facial talon cusp [6,8–14]. All cases of facial talon cusp have been reported in the permanent dentition only. The most frequently involved tooth in the permanent dentition is the maxillary lateral incisor, followed by central incisors and canines. On the contrary, the most frequently involved tooth in the primary dentition is the maxillary central incisor and only four cases of talon cusps in the primary lateral incisor have been reported so far in the literature (Table I) [7,15–17]. We report two cases of facial talon cusp in the primary maxillary lateral incisors.

Case 1 (JM)

A 5-year-old female patient (JM) reported for 5-year evaluation at the Gothenburg Cleft Clinic, Sweden. The patient had been born with a right-sided total cleft lip and palate and an incomplete cleft lip on the left side. She was the first child of parents with consanguinous marriage. There was a history of Goldenhar syndrome in the family. Previous cleft

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Table I. Published cases of talon cusp in maxillary primary lateral incisors

Case no.	Author	Year	Sex of patient	Side involved
1	Mader & Kellogg [15]	1985	M	Right
2	Reddy & Mehta [16]	1989	F	Right
3	Acs et al. [17]	1992	M	Right
4	Mays [7]	2005	–	Left

treatment had been a lip adhesion at age 2 months, soft palate closure at 7 months, and a lip-nose repair at age 18 months.

On extra-oral examination the patient had an orthognathic profile. Intra-oral examination showed a tendency towards an edge-to-edge incisor relationship and a posterior crossbite on the right side. A facial talon cusp was observed on the left primary lateral incisor (Figures 1 and 2). The talon cusp did not interfere in occlusion and the tooth (62) was slightly rotated in a mesiolingual direction. The width of the tooth was 6.5 mm. No such tooth anomaly was previously reported in the family. Among other findings, there was a midline shift and a wide medial diastema. The contralateral 52 was almost totally impacted in a palatal position of the lateral segment of the right-sided total cleft of the lip, the alveolar process, and the palate (Figure 2). An occlusal radiograph of the talon cusped 62 showed a large pulp chamber with a normal root (Figure 3). There were no esthetic concerns about the talon cusped deciduous lateral incisor, so no immediate dental intervention was advised.

Follow-up study models of the child in permanent dentition showed that the succeeding permanent incisor on the left side (22) was normally shaped. However, there was a peg-shaped permanent lateral incisor (12) on the other right side.

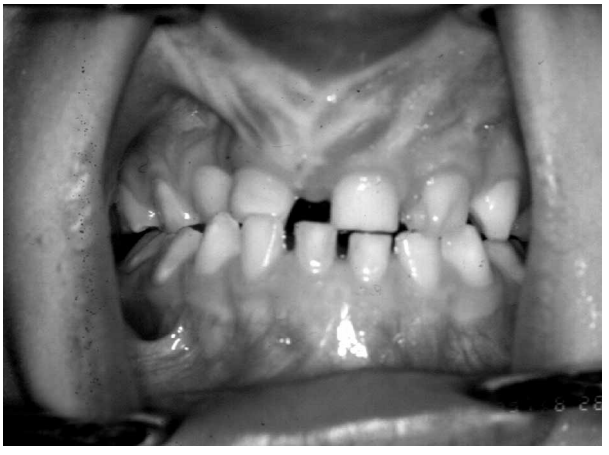

Figure 1. Intra-oral frontal view of a 5-year-old girl with a complete cleft lip and palate on the right side and an incomplete cleft lip on the left side. It shows a facial talon cusp on the left lateral primary incisor (62) (Case 1/JM).

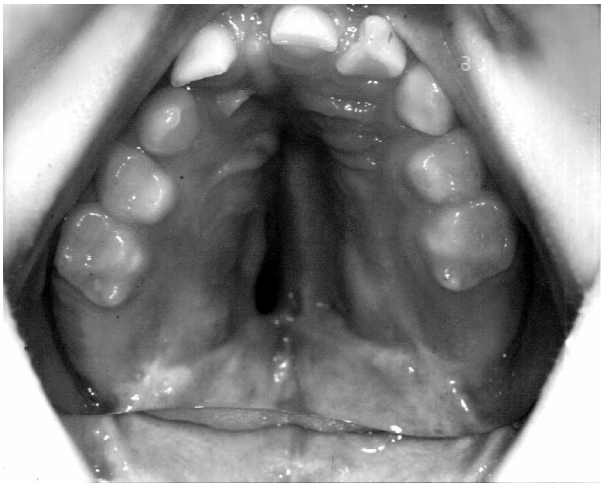

Figure 2. Occlusal view of the facial talon cusp on the left lateral primary incisor (62). It is situated on the side with an incomplete cleft lip. On the right side, with a complete cleft lip and palate, 52 is seen as a semi-impacted tooth located in the palate on the lateral side of the cleft (Case 1/JM).

Case 2 (GA)

A 5-year-old female patient (GA) visited our Cleft Clinic for a routine check-up. The patient had been born with a left-sided unilateral cleft lip including a Simmonart's band and an incomplete cleft in the alveolar process. There was a history of lip surgery at age 13 months.

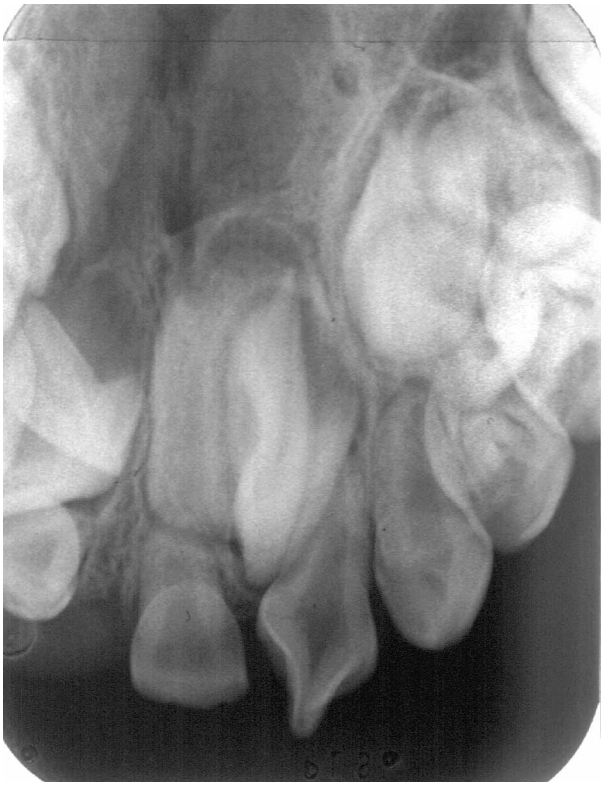

Figure 3. Occlusal radiograph showing a large pulp chamber with a normal root of the talon-cusped lateral incisor (62) (Case 1/JM).

Extra-oral examination revealed an orthognathic profile. Intra-oral examination showed slight crowding in both the upper and the lower deciduous incisors, with mild retroclination. A talon cusp on the facial aspect of the deciduous maxillary lateral incisor on the left side was observed (Figures 4,5). Additionally, there was an unerupted mesial supernumerary lateral primary tooth on this side (Figure 6). The talon-cusped tooth was mesially tilted and out of occlusion (Figure 4). The tooth was 5-mm wide mesio-distally and had similar dimensions to its contralateral deciduous incisor. There was a midline shift of 2 mm towards the right side. The pulp chamber appeared to be slightly enlarged (Figure 6). There were neither esthetic concerns nor clinical signs of any problems related to the talon-cusped primary lateral incisor, so no immediate dental intervention was advised. The permanent lateral successor (22) was diagnosed as possibly being peg shaped on the radiograph (Figure 6).

Follow-up study models in the permanent dentition revealed a very small peg-shaped permanent lateral incisor (22). The tooth was later extracted and prosthetic treatment was carried out.

Discussion

The etiology of the condition is inconclusive. Dental development appears to be primarily polygenic with some environmental influences [18]. There is some anecdotal evidence for genetic influence in the etiology of talon cusp, but no decisive empirical evidence regarding the relative importance of genetic versus environmental factors in its causation [4,19–21]. It has been suggested that disturbance during morpho-differentiation might affect the shape and size of a tooth without impairing the function of the ameloblasts or odontoblasts [22]. Some authors believe that talon cusps occur as a result of an outward folding of the inner enamel epithelial cells and transient focal hyperplasia of the mesenchymal dental papilla [4].

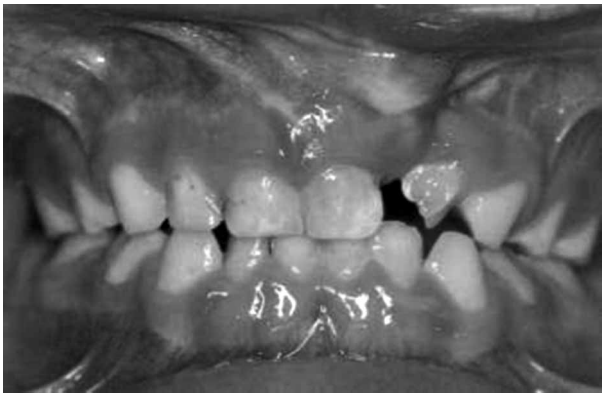

Figure 4. Intra-oral frontal view of a 5-year-old girl with a unilateral cleft lip and alveolar process on the left side. The facial talon-cusped lateral incisor is situated on the left side in a tilted position and out of occlusion (62) (Case 2/GA).

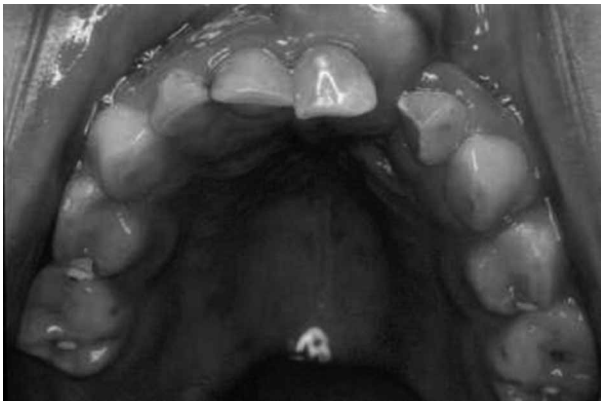

Figure 5. Occlusal view of the lateral primary incisor with the talon cusp, which has erupted in a tilted direction. She also has an unerupted mesial supernumerary lateral primary incisor (Figure 6) (Case 2/GA).

Talon cusps may be associated with other dental anomalies, suggesting a genetic association [3,4,15,23]. The commonly associated anomalies include peg-shaped lateral incisors, impacted mesiodens and canines, odontoma, macrodontia, dens invaginatus, supernumerary teeth, bifid cingulum, and exaggerated Carabelli cusps [4,16,17,24,25]. This could probably be explained by Rantanen's theory of hyperactivity of the anterior part of the dental lamina [26]. One of our cases (Case 2) showed a mesially unerupted supernumerary tooth. Both cases showed the presence of peg-shaped laterals, though in case 1 the peg-shaped incisor was on the contralateral side.

Talon cusps have been classified [27] into 3 types: Type I (true talon – well-delineated additional cusp that prominently projects from the palatal surface of a primary or permanent anterior tooth and extends at least half the distance from the cemento-enamel junction to the incisal edge). Type II (semi talon – additional cusp of 1 mm or more that extends less than half the distance from the cemento-enamel

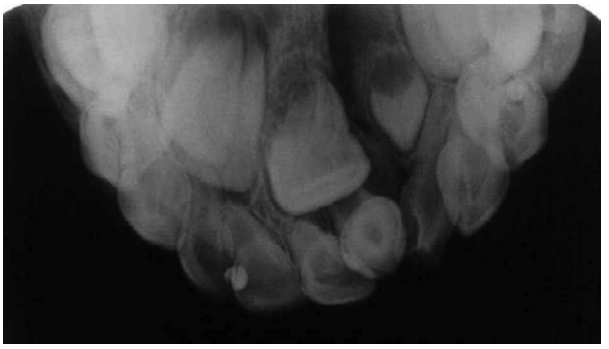

Figure 6. Occlusal radiograph showing the unerupted mesial supernumerary lateral incisor in close proximity to the central primary incisor (61). The permanent succeeding lateral incisor appears to be peg-shaped (22) (Case 2/GA).

junction to the incisal edge and blends with the palatal surface or stands away from the crown). Type III (trace talon – enlarged or prominent cingulum with variations such as conical, bifid, or tubercle-like). The facial talon-cusped teeth in both cases were Type I (true talons).

Talon cusp appears to be more prevalent in patients with Rubinstein Taybi syndrome, Mohr syndrome (oral-facial-digital syndrome, type II), Ellis-van Creveld syndrome, Sturge Weber syndrome (encephalo-trigeminal angiomatosis), or incontinentia pigmenti achromians [5,10,28–30]. Both cases were non-syndromal clefts of the lip and palate.

Abnormalities of number, size, shape, development, eruption, and enamel of teeth are more frequently present in children affected with cleft lip, cleft palate, or both than in the general population [31]. Supernumerary teeth as well as hypodontia are more common in individuals with cleft lip and palate [32,33]. The deviation is mostly found on the cleft side in unilateral cases [33]. However, in case 1 the talon-cusped tooth was located on the side with only an incomplete cleft lip, while the other side showed a total cleft lip, alveolar process, and palate. The dimensions of teeth have been reported to be significantly smaller in cleft subjects than in non-cleft subjects [34]. There is a higher incidence of abnormal dental morphology in cleft patients [35]. About three-quarters of these abnormalities involve the incisor teeth, in particular the lateral incisor adjacent to the cleft site [36]. Some authors have suggested that the upper peg-shaped lateral incisors may be a microform of a cleft [37]. This view has been challenged by others [35]. At least 15 dental morphological abnormalities have been reported as occurring at a higher incidence compared to a normal population [38]. These include differences in both primary and permanent dentition [39]. To date, no reports of facial talon cusp in primary lateral incisors in cleft patients have been published.

We did not find evidence of any problems related to the primary facial talon-cusped teeth in these two cases. The most frequent clinical problems arising due to a talon cusp include compromised esthetics, occlusal interferences, accidental cusp fracture, interference with tongue space, temporomandibular joint pain, tongue irritation during speech and mastication, periodontal problems due to excessive occlusal forces, caries susceptibility because of developmental grooves on the talon and misinterpretation of radiographs of these teeth before eruption [3,4,15,26,40]. An unerupted talon-cusped tooth may radiographically be misinterpreted as a supernumerary tooth or a compound odontoma.

Treatment strategies are different for the deciduous dentition and the permanent dentition. Acute problems naturally imply treatment in both the primary and the permanent dentition. Since the primary talon-cusped tooth will exfoliate, the need for treatment other than for an esthetic reason is low. Treatment objectives [3,2,5,26,41] could include preserving pulpal vitality, meeting esthetic and occlusal requirements, establishing caries prevention, and elimination of tongue irritation. Small talons usually require no intervention. However, large prominent and separated talons call for definitive treatment as they may cause problems with esthetics, occlusion, periodontal and caries. Pulp exposures have been reported in attempts to reduce or remove cusps causing an esthetic or occlusal problem [42,43]. Other workers removed 1 to 1.5 mm of talon cusps in one visit, without exposing the pulp [44]. Pulpal tissue has not been detected on ground sections of extracted or exfoliated teeth with talon cusps that have been evaluated histologically [5] and by SEM [15,23,24]. However, in large talon cusps, especially when they are separated from the lingual surface of the tooth, are more likely to contain pulpal tissue [5,27]. In both the above-reported cases there was no objective need for treatment and the patients and their parents did not wish treatment. Thus no active intervention was considered.

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