

CASE REPORT

Talon cusp: a morphological dental anomaly

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Abstract

Talon cusp is a rare developmental anomaly that occurs most commonly on the lingual side of the incisors. It may cause various clinical problems, such as occlusal interference, irritation of the tongue, pulpal necrosis, caries and periodontal problems. Genetics is thought to be a major cause for the occurrence of this anomaly. This article reports three cases of talon cusp in three members of the same family. Clinical and radiographic findings of talon cusp in two siblings and the mother are presented. Early diagnosis of talon cusp helps in selecting the correct treatment procedure and avoiding complications.

Keywords: talon cusp, dental anomaly, developmental anomaly.

□ Introduction

Talon cusp is a rare developmental anomaly in which an additional cusp-like structure projects from the cemento-enamel junction of the maxillary or mandibular anterior teeth in either primary or permanent dentition [1]. Mitchell WH was the first to describe this morphological anomaly in his 1892 article; the case was a talon cusp on the palatal surface of a maxillary central incisor [2]. He described the case as “an abnormal left superior central incisor, on the lingual surface of which is a process of horn-like shape, curving from the base downward to the cutting edge”, but he did not use the term, “talon cusp” [2]. The term, “talon cusp” was first used by Mellor JK *et al.* [3] since the cusp resembled an eagle’s talon in shape. Talon cusps were considered to occur only in permanent dentition until Henderson reported a case of talon cusp in a primary dentition [4]. In the following years, many cases of talon cusps in primary dentition have been reported [5–7]. Talon cusps are most frequently found on the palatal or lingual faces of the teeth; a few reports of labial cases are reported in the literature [8–10].

Talon cusp consists of enamel, dentin and varying extensions of pulp [11]. It originates during the morpho-differentiation stage of tooth development. The exact etiology of this anomaly is controversial. Genetic and environmental factors, aberrant hyperactivity of dental lamina, outward folding of the inner enamel epithelium, altered endocrine functions and a transient focal hyperplasia of the mesenchymal dental papilla may be responsible [1, 11].

The most commonly affected teeth are maxillary incisors [12] and the affected teeth have been reported to occur in males more than females [11, 13] in both primary and permanent dentitions. There are a few data on the prevalence of talon cusps. Hegde S and Kumar BR [14] found nine cases of talon cusp among

4770 school children. Sedano HO *et al.* [15] examined a student population of 32 022 and reported the prevalence of talon cusp as 0.06%, while Chawla HS *et al.* [16] claimed a prevalence of 7.7%.

Hattab FN *et al.* [5] identified three types of this anomaly in order to describe diagnostic criteria: (1) true talon (an 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); (2) semi-talon (an additional cusp of 1 mm or more but extending less than the distance from the cemento-enamel junction to the incisal edge); and (3) trace talon (enlarged or prominent cingulum and variations, i.e., conical, bifid, or tubercle-like). The present paper reports three cases of talon cusp in three members of the same family.

□ Patients, Methods and Results

A 38-year-old man was referred to the Temporo-mandibular Joint Disorders Unit of the Department of Anatomy in the Faculty of Dentistry at Istanbul University (Istanbul, Turkey) with suspected temporo-mandibular joint disorder. Intraoral examination revealed talon cusps on the palatal surfaces of both maxillary lateral incisors. Each of the teeth had a markedly prominent talon cusp that extended from the cervical region towards the incisal edge. The cusps were well defined and perpendicularly localized to the mesiodistal plane of the crown. The form of the talon cusps were hornlike, and can be defined as conical or pyramidal in shape. Developmental grooves were present where the cusp joined the palatal surface but the junction was not carious even packed with dental plaque. Responses of the affected teeth during the pulpal tests were normal. The cusps had no negative effect on the tongue during speech and mastication. The patient had a class III occlusion. The cusp measured

4.6 mm inciso-cervically and 3.1 mm mesio-distally. Periapical radiographs revealed the talon cusps as “V”-shaped radiopaque structures on the laterals. The color of the teeth was clinically normal. The mouth and teeth were examined clinically and no other pathological alterations of the other teeth were present (Figures 1 and 2).



Figure 1 – Bilateral talon cusps on the palatal surfaces of the maxillary laterals of the 38-year-old man.

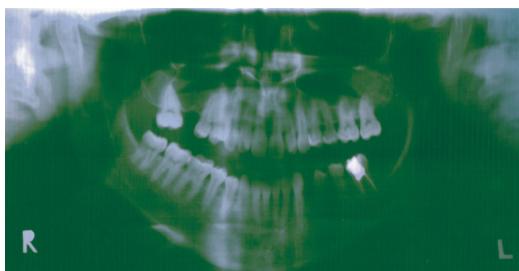


Figure 2 – Panoramic radiograph of the 38-year-old man, depicting the talon cusps bilaterally.

The patient's family history revealed that his 42-year-old sister and mother, aged 62, also had talon cusps. We also examined both the mother and sister.

Clinical examination of the sister disclosed additional cusps located on the palatal surface of the maxillary canines and laterals bilaterally, extending from the cemento-enamel junction halfway to the incisal edge, blending in the palatal surface. The type of the cusps was semi-talon (Figures 3 and 4).



Figure 3 – Bilateral semi-talons on the palatal surfaces on the maxillary canines and laterals of the 42-year-old woman.

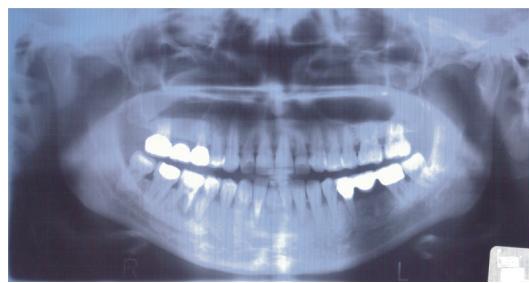


Figure 4 – Panoramic radiograph of the 42-year-old woman, depicting the semi-talons.

The cusps did not interfere with occlusion; neither the laterals nor the canines were carious; therefore, we considered no treatment necessary. All of the four affected teeth responded positively to thermal tests, palpation and percussion. All of the sister's teeth were

clinically normal and had no caries. She had no remarkable medical history.

In contrast, the mother had the talon cusp extracted because of the negative effect on her tongue and psychological condition (as she described it). Figure 5 indicates the filling on the right lateral incisor after the extraction of the cusp, with a denture replacing the extracted taloned tooth following unsuccessful endodontic treatment.



Figure 5 – Panoramic radiograph of the mother.

A written consent from the patients was obtained for the publication of medical recordings and figures.

Discussion

The shape, size and location of talon cusp may vary from a slight tubercle-like projection to a well-delineated prominent cusp extending from the cemento-enamel junction to the incisal edge. They may be found on the palatal/lingual or labial faces of the tooth, in primary or permanent dentition [12]. Topaloglu AkA et al. [10] and Abbott PV [12] reported facial and palatal talon cusps on the same tooth.

The reported cases of talon cusps are commonly unilateral; approximately 20% are bilateral [17]. In the present report, all three cases were bilateral.

Upon review of the literature, it appears that talon cusps are most frequently reported to be found on maxillary lateral incisors. In accordance with the early reports, all of the laterals were affected in the cases reported here. According to Segura JJ and Jiménez-Rubio A [17] the reason for this condition may be the compression of the tooth germ of the lateral incisor by the central incisor and the canine, which develop seven months earlier than the lateral incisor. Increased pressure on a tooth germ may cause outfolding of the dental lamina during the morpho-differentiation stage.

The prevalence of talon cusp ranges from 0.06% to 7.7% in the literature [15, 16], however, Hamasha AA and Safadi RA [18] suggest to consider the reported prevalence with caution since the designs of the previous studies do not constitute a community base screening and the criteria may vary from one case to another, while they found the person prevalence as 2.4% in their study.

Talon cusp may be associated with some other dental anomalies as bifid cingula, dens invaginatus, shovel-shaped maxillary incisors, odontome, impacted teeth and fusion. The anomaly has also been associated with Rubinstein-Taybi syndrome, Mohr syndrome, Sturge-Weber syndrome and Ellis-van Creveld syndrome [11]. Cytogenetic or molecular investigations may be useful

in suspected cases. However, none of the three cases reported here had any systemic syndrome.

Talon cusp may cause a variety of clinical problems such as occlusal interference, irritation of tongue and neighboring oral tissues, pulpal necrosis, caries, attrition, periodontal problems, displacement of the affected tooth, breast feeding difficulties, esthetic problems, accidental cusp fracture, radio-diagnostic issues and even temporo-mandibular disorders [19, 20]. Management of talon cusp may differ depending on each case. Treatment procedure may include fissure sealants, sequential grinding, pulp therapy, restorative treatment, full crown coverage and extraction of the affected tooth. The patient in case three had the talon cusp on her tooth extracted because of irritation of her tongue, and had a composite filling. The periapical radiographic examination indicates no endodontic treatment, which means the cusp contained or was devoid of a pulp horn.

The family involvement and the combination of other abnormalities suggest that genetics may be active as a major cause for the occurrence of this anomaly. Lee CK *et al.* [6] asserted that the hyperactivity of the primordial cells is genetically determined, and that if the hyperactivity is limited, or only a small proportion of the cells is affected, a talon cusp may result. When the present case and the previous reports of two siblings, two cousins, and two sets of twins having talon cusps are considered, the anomaly seems to have hereditary characteristics [19].

Conclusions

Clinicians should have a broad knowledge regarding developmental anomalies, their variations and the clinical consequences. Early diagnosis of talon cusps helps in selecting the correct treatment procedure and avoiding complications. Moreover, it is important for the dental practitioner to keep in mind that talon cusp may be associated with other systemic and dental anomalies. A detailed medical and family history should be taken and, if possible, other close members of the family should be examined.

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