Talon Cusp: Report of Two Cases and Review of Literature

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INTRODUCTION

Development and formation of the tooth and its supporting structure is a very complex process involving various molecular signalling pathways. Any aberrations during the different stages of odontogenesis can result in various types of developmental anomaly. Talon cusp is one of such developmental dental anomaly in which accessory cusps like structure arise on the crown surface before the calcification has occurred. It was first described in the literature by Mitchell in 1892. Due to the resemblance to an eagle’s talon Mellor and Ripa termed this anomaly as talon cusp.1

Talon cusp consists of normal tooth structure such as enamel, dentin and extensions of pulp. It originates during the morpho-differentiation stage of tooth development. Exact etiology of this anomaly is not known, but the most accepted hypothesis is due to the abnormal activity of the dental lamina.2 The role of genetic and environmental influences is still unclear. It mostly occurs as an isolated finding rather than an integral part of any disorder however other anomalies, and syndromic conditions may be associated with it.3

It was most commonly found in the permanent dentition with prevalence of 0.06-7.7%.4 Maxillary teeth (94%) are the mostly affected, among them maxillary lateral incisors (55%) are commonly involved.3

The present article reports two cases of talon cusp affecting permanent maxillary lateral incisor in one case and permanent mandibular central incisor in the second case.

CASE REPORTS

Case 1
A 12-year-old boy, reported to the Dental Department with the complaints of malaligned upper anterior teeth. The patient’s family and medical history was uneventful. No other anomalies were noticed extra orally. Extraoral findings were insignificant. Intraoral examination revealed a permanent dentition and well-maintained oral health. The permanent maxillary left lateral incisor was seen distally rotated with the presence of talon cusp on the palatal side and buccally erupted canine (Figures 1 and 2). Talon cusp was conical to pyramidal in shape with a tip appears to be bifurcated by a developmental groove. Developmental grooves were also present at the junction of talons cusp and palatal surface of the tooth. These grooves were not carious and not even packed with dental plaque. It measured approximately 3.8 mm in width (mesiodistally), 3 mm in length (incisocervically) and 2.5 mm in thickness. The tooth was asymptomatic and showed normal response to electric and thermal pulp tests. Radiographic examination showed inverted V-shaped radiopaque structure consisting of enamel, dentin and extension of pulp to the middle of the cusp (Figure 3). Corrective orthodontic treatment with coronoplasty of talon cusp was performed to maintain occlusal and aesthetic harmony.

Case 2
A 21-year-old male patient presented to the dental department for routine dental check-up. On intraoral examination, well-defined accessory cusp was found on the lingual surface of the left permanent mandibular central...
incisor (Figures 4 and 5). The cusp was conical in shape with a rounded tip pointing towards incisal edge. The dimensions of cusp were approximately 1.5 mm in width and 3 mm in length from the cingulum toward the incisal edge. Radiographically, inverted V-shaped radiopacity was seen with separate enamel and dentin structure (Figure 6). No dental caries were noticed. It did not cause any occlusal disturbance and not even irritated the surrounding soft tissues during functional movements. On electric and thermal pulp testing, tooth responds normally. No other
developmental dental anomalies were noticed. Medical and family histories were unremarkable. Due to the absence of any significant clinical problem no treatment was instituted, and regularly followup was advised.

**DISCUSSION**

Talon cusp has been defined as an accessory talon-shaped cusp arising from the lingual (or facial surface) of the crown of a tooth and extending at least half of the distance from the cemento-enamel junction (CEJ) to the incisal edge of the tooth.6

Mitchell first reported this dental anomaly on the palatal surface of the maxillary central incisor, in his 1982 article. He described the anomaly as “an abnormal central incisor with hornlike process present on the lingual surface,” but he did not mention the term, “talon cusp.”

Mellor et al. (1970) first mention the term “talon cusp,” since the cusp resembled an eagle’s talon. After this term several descriptions has been given to this dental anomaly, such as, exaggerated cingula, cusp-like hyperplasia, dens evginatus, interstitial cusp, additional cusp, tuberculated premolar, odontoma of axial core type, evaginated odontoma, prominent accessory cusp-like structure, occlusal anomalous tubercle and supernumerary cusp.7

Various theories were proposed regarding the etiology of the talons cusp, but the most accepted hypothesis is the aberrant hyperactivity of the dental lamina.8 Environmental and genetic factors, altered endocrine functions, transient focal hyperplasia of the mesenchymal dental papilla, and outward folding of the inner enamel epithelium may also be responsible.22 As there was no relevant medical and family history in both of the present cases, aberrant hyperactivity of the dental lamina may be an etiological factor.

Maxillary teeth (94%) showed a striking predilection over mandible. Among maxillary teeth, maxillary lateral incisors (55%), followed by maxillary central incisor (33%) are the most commonly involved.4 In the first case of the present report, talon cusp was found on the permanent maxillary left lateral incisor. The high incidence of occurrence in lateral incisor is due to compression of the tooth germ during the morpho-differentiation stage between the central incisors and canine. The sequelae of compression can either result in an outward folding or an infolding of the dental lamina.1 In the second case, it has been observed on the left permanent mandibular central incisor, which is relatively rare site for its occurrence.

Talon cusp was found predominantly in males (65%).4 Both the patients reported in the present article were male. Prevalence of talon cusp varies among different ethnic and religious groups. There are a few data on the prevalence of talon cusps. Sedano et al. examined a student population of 32,022 and reported a prevalence of talon cusp as 0.06%, while Chawla et al. claimed a prevalence of 7.7%.10

Although this cusp has not been reported as an integral part of any specific disease or syndrome, it appears to be more prevalent in patients with Sturge-Weber syndrome (encephalotrigeminal angiomatosis), Mohr syndrome (oral-facial-digital syndrome Type II), Rubinstein-Taybi syndrome or incontinentia pigmenti achromians.11 However, none of these alteration or syndrome was reported in present cases.

There is a wide range of variation in shape and size of this anomaly. Hence, in order to have specific diagnostic criteria, talon cusps have been classified into the following types by Hattab et al.12

- **Type 1 (Talon):** An additional cusp that prominently projects from the palatal (or facial) surface of the anterior tooth and extend at least half the distance from the CEJ to the incisal edge.
- **Type 2 (Semi talon):** An additional cusp of a 1 mm or more in length extending less than half the distance from the CEJ to the incisal edge. It may blend with the palatal surface or stand away from the crown.
- **Type 3 (Trace talon):** An enlarged or prominent cingula and their variations, i.e., bifid, conical or tubercle-like.

The talon cusps described in the current report were classified as Type 1 (talon) in first and type 2 (semi talon) in the second case.

Radiographically, the talon cusp is seen as radiopaque structure, in which the enamel, dentin and sometimes the pulpal space can be noticed. In general, it represents a V-shaped structure superimposed over the normal image of the crown.1 The reported cases revealed inverted V-shaped radiopaque structure with the extension of pulp up to the middle of the cusp in first case whereas in other case such pulp extension was not seen.

Varieties of clinical problem were associated with talons cusp such as occlusal interference, irritation of tongue and neighbouring oral tissues, pulpal necrosis, caries, attrition, periodontal problems, displacement of the affected tooth, breastfeeding difficulties, aesthetic problems, accidental cusp fracture, radio-diagnostic issues and even temporomandibular disorders.13 In the first case malalignment of upper anterior teeth was the major clinical problem whereas in second case no such clinical problems were observed.

Management of talon cusp may differ depending on each case. Treatment procedure may include fissure sealants, sequential grinding, restorative treatment, full crown
coverage, pulp therapy and extraction of the affected tooth. So, correct and early diagnosis with definite treatment is most crucial, especially during the patient’s formative years to prevent the complications.8 The patient in first case had undergone corrective orthodontic treatment with coronoplasty of talon cusp to maintain good occlusal and aesthetic harmony, whereas in second case none of the treatment options were used because there were neither premature contacts nor any other pathological changes. In both cases, patients were advised for regular follow-up.

CONCLUSION

Talon cusp is an innocuous defect, but it may provide severe complications. So, it is important for the clinicians to have a basic knowledge regarding developmental dental anomalies and the clinical problem associated with it. Early diagnosis and appropriate treatment of such dental anomaly can minimize the possible complications in the future.

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REFERENCES