An atypical presentation of talon cusp: Double talon cusps

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ABSTRACT

Talon cusp is an uncommon developmental anomaly resulting in an extra cusp or cuspal projection on an anterior tooth consisting of normal enamel, dentin, and varying degrees of pulp tissue. Talon cusp shows varied presentations of which the palatal talon cusp has been the most common of all. The management requires an extensive understanding of this clinical entity and the complications associated with its occurrence. In this case series, we are reporting double talon cusps which is a rarity itself, involving the palatal aspect of maxillary central incisors.

Key words: Classification, Developmental anomaly, Double talon cusps, Maxillary central incisor

Aberrations in any of the stages of tooth development can bring about disturbances during morphodifferentiation resulting in talon cusp formation. It is a developmental anomaly characterized by the presence of a vertical ridge or cusp that projects labially or lingually from an anterior permanent or primary tooth which is frequently seen in the maxillary lateral incisors and less commonly in the central incisors and canines. Talon cusp was first recognized by Mitchell. The term was coined due to its resemblance to an eagle's talon in an occlusal view. Other terms like dens evaginate of anterior teeth, tuberculum dentale, and rugae adamantineae have been cited in the literature [1]. Schulze referred it as a very high accessory cusp, which may connect with the incisal edge to produce a "T" shaped, or if present more cervical, a "Y" shaped crown contour [2]. Permanent dentition gets affected three times more often than primary dentition. It has a predilection for the maxillary teeth, and males are commonly affected [3].

Although the occurrence of talon cusp is a rarity with prevalence ranging from 0.06% to 40.8% [1], the occurrence of double talon cusp is even rare and is less reported so far. Hence, this case series aims to report these unusual cases of talon cusp along with a review of the literature.

CASE SERIES

Case 1

A 10-year-old boy came with the chief complaint of spacing in the left upper front teeth region. The patient's history revealed a history of trauma, a year ago. General examination and local extraoral examination revealed no abnormality. Intraoral examination revealed the presence of dental caries in 54, 64, 74, and 75. The patient had labially displaced 21. There were two cusp-like projections extending from the cementoenamel junction (CEJ) curving toward the incisal edge of 21 in the palatal aspect (Fig. 1).

The pulp vitality test revealed normal response in 21, 22, and 12 but no response in 11. Intraoral periapical (IOPA) radiograph revealed two dense V-shaped radio-opaque shadows superimposed on the image of the affected 21 with the point of the V toward the incisal edge. Each cusp image is demarcated by two distinct lines converging from the CEJ toward the incisal edge. Pulp extension could be traced to the cervical one-third of the talon cusp. The cusps are within 1 mm from the incisal edge (Fig. 2a). Cone-beam computed tomography (CBCT) revealed a well-defined radio-opaque structure, conical in shape present on the palatal surface in relation to 21, with some pulp extension into the cervical one-third of the accessory cusp (Fig. 2b and c). With the above findings, a Type I talon cusp diagnosis in 21 was given. The patient was referred to the Department of Pedodontics for further management.

Case 2

A 29-year-old female came with the chief complaint of a painful left lower back tooth. The patient's history was non-contributory. General examination and local extraoral examination revealed no abnormality. Intraoral examination revealed grossly decayed 38,

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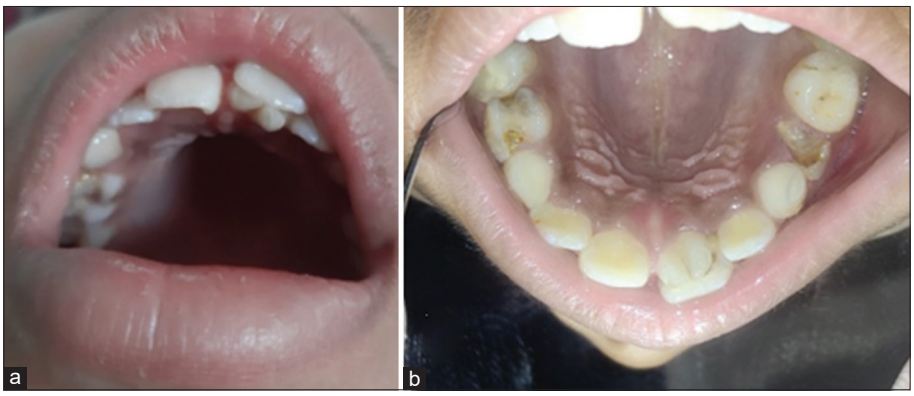

Figure 1: Clinical pictures showing proclined 21 with double talon cusps on its palatal surface. (a) Type 1 Talon. (b) morphologically well-delineated additional cusp that prominently projects from the palatal (or facial) aspect/surface of a primary or permanent anterior tooth and extends at least half the distance from the cementoenamel junction to the incisal edge (Case 1)

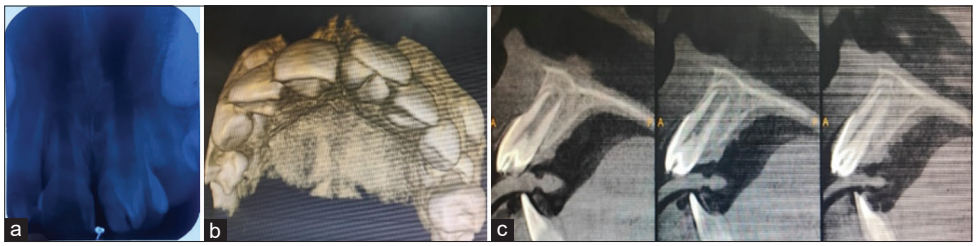

Figure 2: Radiographic images showing double talon cusps with some degree of pulpal extension. Root development appears to be slightly delayed in 11 and 21. (a) Non-vital 11 and talon cusps in 21; (b) 3D reconstructed cone-beam computed tomography image; (c) sagittal view of 21 showing some pulp extension into the accessory cusp (Case 1)

dental caries in 37 and 47, and two small cusps on the palatal aspect of 11 and 21 in the cingulum region (Fig. 3).

IOPA image of 11 and 21 revealed two V-shaped radiopaque shadows on the cervical one-third of the crown of 11 and 21. The talon cusps extend from the cemento-enamel junction to within 5 mm of the incisal edge of 11 and 21 (Fig. 4c). CBCT images revealed a well-defined radio-opaque structure, conical in shape present on the palatal surface in relation to 11 and 21 with some degree of pulp extension into the accessory cusp (Fig. 4a,b,d and e). With the above findings, a Type II talon cusp diagnosis in 21 was given. The patient was treated for her chief complaint and the talon cusps did not require any intervention, as it was not her chief complaint and did not produce any problem for the patient.

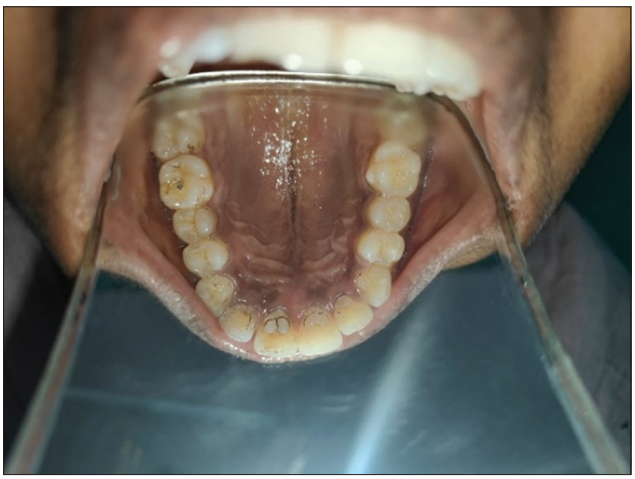

Figure 3: Clinical picture showing double talon cusps on the palatal surface of 11 and 21. Type 2 Semi talon – an additional cusp of a few millimeters extending less than half of the distance from the cementoenamel junction up to the incisal edge (Case 2)

DISCUSSION

Talon cusp is a well-delineated developmental anomaly affecting the maxillary permanent incisors and rarely affecting the mandibular and primary incisors. Talon cusp was first reported by Mitchell in 1892 and was named by Mellor and Ripa in 1970 [1]. The incidence of talon cusp has been found to range from 1% to 6% of the population. Individuals of Asian, Arabic, Native American and Inuit descent are more commonly affected [4]. Talon cusp affects both genders but has more predilection for males [4].

Hattab *et al*. classified talon's cusp as Type 1: Talon – a morphologically well-delineated additional cusp that projects from the palatal (or facial) aspect of a primary or permanent anterior tooth and extends at least half the distance from the CEJ to the incisal edge. Type 2: Semi talon – an additional cusp of a millimeter or more, extending less than half the distance from the CEJ up to the incisal edge. It may blend with the palatal surface or stand away from the rest of the crown. Type 3: Trace talon – an enlarged or prominent cingulum and its variations, that is, conical, bifid, or tubercle-like [5]. Mayes classification of facial talon cusp (2007) classified the stages of talon's cusp as Stage 1 – slightly raised triangle on the labial surface of an incisor extending the length of the crown, but not reaching the CEJ or the incisal edge. Stage 2 – a raised triangle on the labial surface of an incisor that extends the length of the crown, does not reach

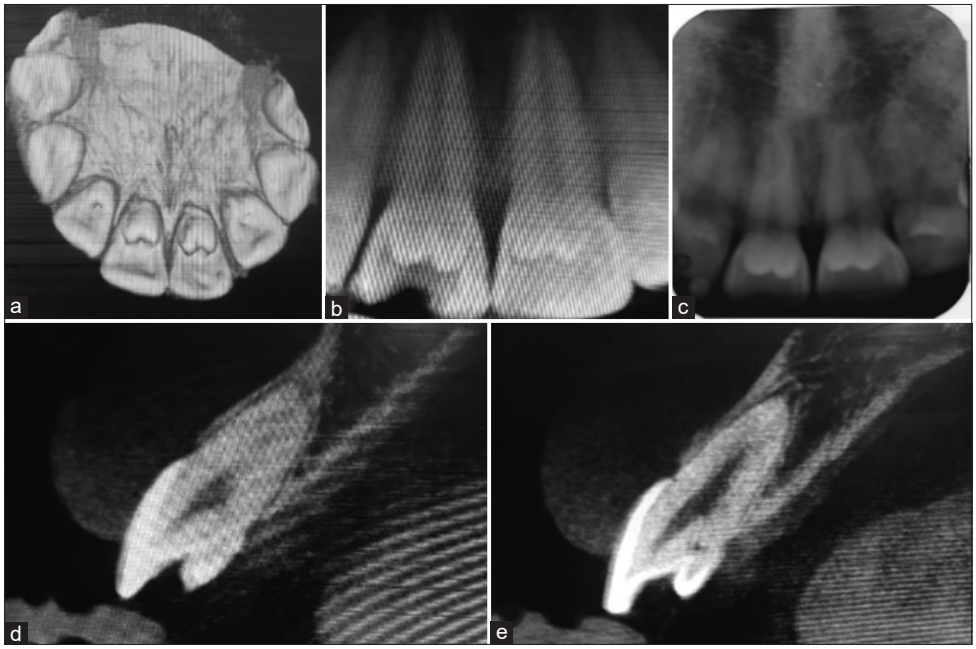

Figure 4: Radiographic images showing the double talon cusps with some degree of pulpal extension in 11 and 21. (a) 3D reconstructed cone-beam computed tomography image. (b) Coronal view of 11 and 21. (c) IOPA image of 11 and 21. (d) Sagittal view of 11. (e) Sagittal view of 21 (Case 2)

the CEJ, but reaches the incisal edge, and can be detected clearly and palpated easily. Stage 3 – a free-form cusp extending from the CEJ to the incisal edge on the labial surface of an incisor [6].

The etiology is believed to be a combination of environmental and genetic factors. It has been suggested that it may be due to the outward folding of inner enamel epithelial cells (precursors of ameloblasts) and a transient focal hyperplasia of the mesenchymal peripheral cells of the dental papilla (precursors of odontoblast) [7].

Talon's cusp can be sharp and spike-like, while some have rounded and smooth tips. The cusp tip may stand apart from the crown or be seen in close approximation to the palatal aspect of the crown. It may be observed on single or multiple teeth, unilateral or bilateral, and on the palatal/lingual or labial aspects of the affected teeth [8].

Talon cusp has been widely described in coexistence with other developmental pathologies or genetic syndromes, constituting a potential clue to an understanding of the underlying etiology. These include developmental anomalies such as mesiodens, odontome, supernumerary teeth, hypodontia, hyperdontia, dens invaginatus, fused teeth, geminated teeth, radicular anomalies, and syndromes like Mohr syndrome, Rubinstein-Taybi syndrome, Sturge-Weber syndrome, Alagille's syndrome, and occulo-facio-cardio-dental syndrome, KBG syndrome. Reports of familial cases, such as in twins, siblings, or first-degree cousins, suggest a significant involvement of genetic factors in etiological mechanisms [1]. Talon cusps can be seen in association with some syndromic conditions. A former study showed a direct correlation between talon cusp and Rubinstein-Taybi syndrome, in which 92% of these patients had a talon cusp [9]. A proper family history should be recorded which aids in ruling out future complications. The cases reported here were not associated with any of the developmental syndromes.

The extent of pulp is difficult to be appreciated well in radiographs due to the superimposition of tooth structure. It appears as a "V"-shaped radiopaque structure which superimposes on the crown's image as in true talon or semi-talon or can be tubercle-like, as in trace talon, originating from the cervical area. In mandibular cases, the point of the "V" is reversed [10]. Photographs are insufficient to describe their intricate morphology. However, successful diagnosis is now feasible with the advent of CBCT.

Smaller talon cusps are asymptomatic and do not cause complications. The complications include displacement of the affected and opposing teeth, compromised esthetics, traumatic occlusion, plaque retention, caries susceptibility, periodontal disease, hypersensitivity, pulpal necrosis, periapical pathology due to excessive attrition, attrition of the opposing teeth, accidental fracture of the cusp, irritation of tongue during speech and mastication, interference with tongue space, speech disturbance, breastfeeding difficulties, and TMJ pain due to excessive occlusal forces [11].

Comprehensive clinical and radiographic review is required for effective diagnosis and treatment. If the talon cusp is not fully erupted, on radiographs, it appears as a compound odontome or a supernumerary tooth, leading to misdiagnosis [8]. In cases where the talon cusp interferes with occlusion, pulp exposure may be inevitable during the reduction of the talon cusp, where endodontic treatment should be performed [12]. Fissure sealing and composite resin restoration may be required to prevent the incidence of caries. Orthodontic management may be crucial in case of malalignment of the same or opposite tooth [13,14].

CONCLUSION

The cases described in this case series consist of an asymptomatic dental anomaly that did not accompany any other variation in the

tooth or arch. Oral physicians should have a thorough knowledge of developmental anomalies, their variations, and clinical complications. Early diagnosis of talon cusps aids in choosing the appropriate treatment and avoiding complications.

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