Labial and Palatal Talon Cusps on Geminated Tooth Associated with Dental Root Shape Abnormality: a case report

Cıgdem Elbek Cubukcu* / Alper Sonmez** / Vedat Gultekin***

Talon cusp on a geminated tooth is a very rare condition. To the best of our knowledge, the literature contains only one case report of a labial talon cusp on a geminated tooth. This is the first clinical report describing a case of bilateral talon cusps on geminated permanent maxillary central incisors associated with dental root shape abnormality and its successful management.

Key words: *case report, incisor/abnormalities, dental root/abnormality, management.*
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INTRODUCTION

Geminated teeth are developmental anomalies of tooth shape that arise from an abortive attempt by a single tooth bud to divide, resulting in a bifid crown.[1] The resultant structure is usually one with two completely, or partially separated crowns having a single root and root canal.[2] There seems to be no gender difference in occurrence. The teeth most often affected are the primary mandibular incisors and permanent maxillary incisors. Heredity appears to be an important etiologic factor. Geminated teeth appear large in the mesio-distal dimension. Treatment usually aims to create a cosmetic result.[3]

Talon cusp is a relatively rare condition by itself. It is characterized by the presence of an accessory cusp-like structure projecting from the cinglum area or cementoenamel junction of the maxillary or mandibular anterior teeth.[4,5] The anomalous tooth structure is composed of normal enamel and dentin either has varying extensions of pulp tissue into it or is devoid of a pulp horn.[1,4,6,7] The prevalence of talon cusps is low, with an incidence of less than 1% to approximately 8% of the population.[6] It is suggested that this condition has a multifactorial etiology combining both genetic and environmental factors.[8] Although the exact mechanism is unknown, it is believed to develop during the morphodifferentiation phase of tooth development.[6] This anomaly has also been reported to be associated with the Rubinstein-Taybi syndrome, Mohr syndrome, Sturge-Weber syndrome and with anomalies such as peg-shaped lateral incisors, shovel-shaped incisors, megadont, odontoma, dens invaginatus, geminated tooth, supernumerary tooth and impaction.[1,9-13]

There were 35 reports involving 108 teeth, with most (77%-92%) occurring in the permanent dentition. Maxillary teeth were the most commonly involved (94%), and 65% of the talon cusps occurred in males. Most common were maxillary lateral incisors (55%) followed by maxillary central incisors (33%) and canines.[1,6]

Talon cusp on a geminated tooth is a very rare clinical situation. A review of the literature revealed only three previous reports.[1,14,15] The following clinical report describes a case of bilateral talon cusps on geminated maxillary central incisor associated with dental root shape abnormality and its management.

CASE REPORT

A 13-year-old girl referred to the Department of Pediatric Dental Care of Medical Faculty with a chief complaint of the presence of large, abnormal maxillary incisor, irritation to the tongue and biting problems. Intra-oral examination indicated the patient was in the mixed dentition stage, with a Class I molar relationship. Teeth 13, 14, 15, 23, 35, 33, 42, and 43 were not yet erupted. There were increased overjet and overbite, slightly rotated upper left central incisor, and anterior mandibular crowding. Oral hygiene was fair. The unsightly maxillary incisor had a large and bifid crown in which the mesiodistal crown diameter was 6 mm larger than the adjacent left central incisor (15 mm vs. 9 mm). The tooth was not fully erupted, with crown height measuring 12 mm. On the palatal aspect of the tooth, the crown exhibited two pronounced, well-defined accessory cusps (talon cusps) extending from the cementoenamel junction to the incisal edge. The talon cusps were pyramidal in shape and located on the mesial half of the crown,

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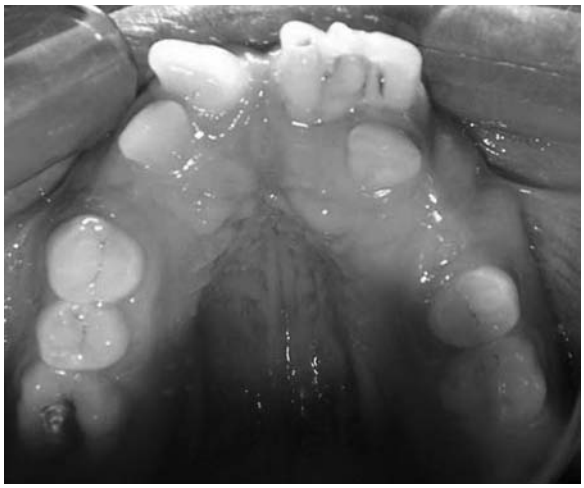

Figure 1: Palatal appearance of the geminated tooth with talon cusps.

Figure 2: Labial appearance of the geminated tooth with talon cusps.

with the tip of the cusp attached to the crown. The right cusp was measured 9 mm in length (inciso cervically), 3 mm in width (mesio distally) and 3 mm in thickness (labio lingually); the left cusp was 1 mm shorter and 1 mm thinner than the right cusp. Noncarious developmental groove was present between the cusps (Figure 1). On the labial aspect of the tooth, the crown also exhibited a pronounced, well-defined, and teat-like process indicated another talon cusp, measuring 8 mm in length from the cementoenamel junction to within 3 mm of the incisal edge (Figure 2). The affected tooth responded normally to electric and thermal pulp testing.

A periapical radiograph showed two V-shaped radiopaque structures superimposed on the image of the affected crown, with the vector towards the incisal edge. The talon cusps were outlined by two distinct white lines converging from the cervical area of the affected tooth toward the incisal edge. Between the talon cusps a radiopaque process, which was indicating the labial talon cusp, could easily be identified. The tooth had a single enlarged pulp chamber and one root appearance (Figure 3). An occlusal radiograph revealed the presence of right lateral incisor, with the affected tooth impeding the eruption of the adjacent lateral incisor. Pulp extension of the talon cusps could be traced (Figure 4).

Figure 3: Apical radiograph of the geminated tooth with talon cusps. Note the talon cusps indicated by arrows.

Figure 4: Occlusal radiograph of the geminated tooth with talon cusps. Note the pulp extensions of the talon cusps.

A panoramic radiograph was taken for detailed investigation, showing tooth 42 was congenitally missing. The apices of teeth 13, 14, 23, and 43 were still open. The roots of teeth 13, 14, 23 were extremely long (Figure 5).

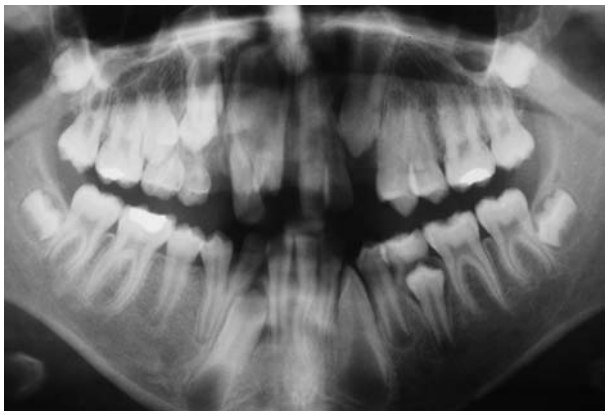

Figure 5: Panoramic view of the patient at the initial diagnosis.

Based upon clinical and radiographical findings, a diagnosis of bilateral talon cusps on geminated tooth was made.

After diagnosis, the geminated tooth was extracted using an open extraction method in order to protect the vestibular alveolar ridge and the floor of the nose. After the extraction of the geminated tooth, the dimensions of the tooth were measured with 37 mm in length (from the incisal edge to the apex orifice), 15 mm in width (mesiodistally), and 6 mm in thickness (sagittally) (Figure 6).

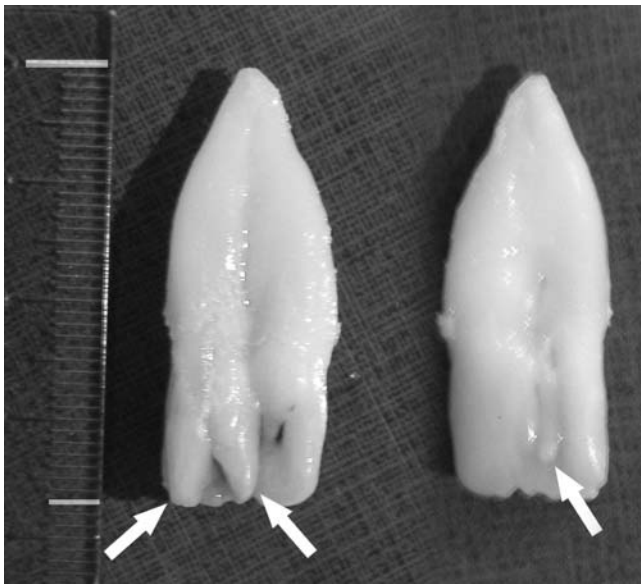

Figure 6: Total length of the geminated maxillary right incisor with talon cusps from the labial and palatal aspect after the extraction. Note the talon cusps indicated by arrows.

There was no history of hereditary or hormonal disorder, orofacial trauma, or consanguinity. No other member of the family was affected by similar dental anomalies. The patient appeared well-developed.

After the extraction of the geminated tooth, orthodontic treatment was completed. The final (finishing) panoramic radiograph was taken and seen that teeth 13, 14, 23 and 43 had long roots and the roots of teeth 13, 14, 23, 24, 25, 31, 33, 34, 43 and 44 were still developing (Figure 7). The patient was informed about the development of teeth 13, 14, 23, 33 and 43 and warned about the danger of spontaneous mandibular fractures and the importance of periodic dental check-ups. The patient was referred for prosthetic rehabilitation of the maxillary anterior region (Figure 8).

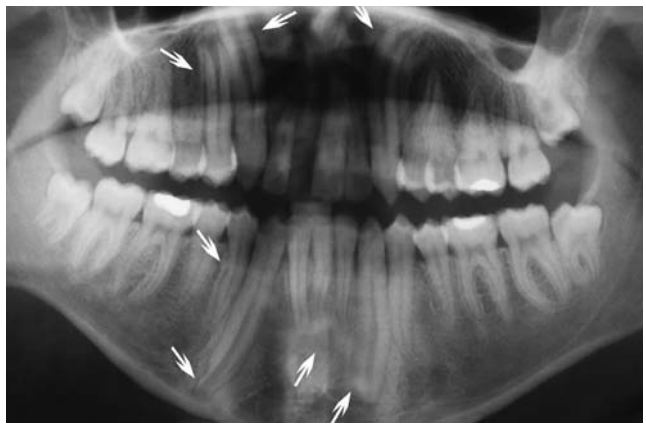

Figure 7: Final panoramic view of the patient. Note the root shape abnormalities of teeth 13, 14, 23, 31, 33, 43 and 44 (indicated by arrows).

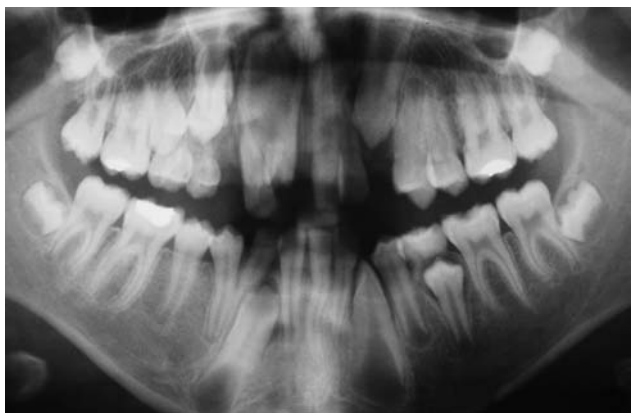

Figure 8: Final view of patient with removable retainer after orthodontic alignment.

DISCUSSION

Jowharji *et al.*[16] suggested altering the definition of a talon cusp to indicate possible projection from either the palatal or labial surface of a tooth and extending to at least half the distance from the cementoenamel junction to the incisal edge in order to distinguish talon cusps from a small tubercle or a raised cingulum. In its typical shape, the anomaly resembles an eagle's talon,[17] but it could also present as pyramidal, conical or teat-like.[10,12,17-19]

Talon cusps are defined as occurring on the palatal surface, although there have been two case reports of talon cusps on the labial surface of maxillary permanent central incisors.[16,17] A case of labial and palatal talon cusps on the same tooth was reported by Abbott in 1998.[6] Although, Hattab and Hazza (2001)[1] reported a case of a palatal talon cusp on a geminated maxillary central incisor, none of the earlier cases described three talon cusps on a geminated tooth one on the labial surface and two on the palatal surface. To best of our knowledge, this is the first report of a geminated tooth, with

three talon cusps on both the labial and palatal surfaces. Both talon cusps matched the criteria suggested by the literature.[6-19]

Most talon cusps contain extensions of pulp tissue similar to pulp horns.[20] However, the length of the extension is unclear and can be assessed only on radiographs. Because the talon cusp and its pulp extension are superimposed over the main pulp chamber, the extent of the extra pulp horn is difficult to distinguish.[21]

The presence of a talon cusp is, in itself, not an indication for endodontic or other dental treatment unless it is associated with problems such as compromised esthetics, occlusal interference, displacement of teeth, caries, periodontal problems, or irritation of the tongue during speech and mastication.[16,22] The patient in the present case had several of these problems. The labial cusp on the geminated tooth had caused periodontal pocketing. The palatal cusps also produced speech and masticatory complications, irritated her tongue and her lower lip, and had created occlusal interferences with tooth rotation. The tooth had impeded the eruption of the adjacent lateral incisor.

Several forms of treatment have been advocated for the management of talon cusps: gradual, periodic reduction of the cusp, or total removal of the cusp and restoration of the resultant defect.[6,22-25] Orthodontic correction can then be undertaken when required.[23] Gradual, periodic reduction of the talon cusp may encourage the development of reparative dentin and pulp obliteration within the extension.[23,27] This approach appears to be adequate in some cases but cannot be applied predictably in all situations, particularly if the occlusal interference is severe. In those cases, a complete reduction of the cusp is required. This is probably the most common approach, but requires some form of pulp therapy. Normal width of maxillary central incisor is 8.5 mm.[28] In the present case, the mesiodistal crown diameter of the geminated tooth with three talon cusps was 15 mm. Either the gradual, periodic reduction or a complete reduction of the talon cusps on this geminated tooth were not an option, since the crown of this geminated tooth was macrodontic and creating esthetic problems. Since the patient presented a malocclusion, an orthodontic treatment was inevitable, extraction of the tooth was mandatory. Therefore, the tooth was extracted and then orthodontic correction was undertaken.

In this case, the interesting aspect is that the involved maxillary central incisor was geminated and the tooth had three talon cusps-two talon cusps on its palatal surface and one minor talon cusp on its labial surface created molariform-giant tooth shape. The patient also had extremely long roots on 13, 14, 23, 33, and 43. In order to diagnose this patient correctly, the level of anterior pituitary hormones were calculated an appeared to be within normal limits. The extremely long roots of the permanent canines and premolars and the question of "why these teeth were still developing" could not be explained in a satisfactory way.

Geminated-taloned teeth cause a variety of clinical problems that need to be addressed. Care should be taken to recognize developmental, periodontal and orthodontic effects. The patient's expectation and degree of compliance must also be accurately assessed in an attempt to determine suitable management.

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