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Bilateral geminated teeth with talon cusps: A case report

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ABSTRACT

Talon cusps and gemination are rare dental anomalies that can cause significant aesthetic and clinical problems. Bilateral talon cusps on geminated teeth have not been reported so far. The case of gemination with talon cusps on both maxillary central incisors was presented in this report. The main complaints of the patient were tongue irritation and aesthetic problems. The talon cusps were gradually reduced at 2 consecutive sittings and the exposed surface was treated with a fluoride gel. The aesthetical appearance was improved using a composite resin. Fixed orthodontic treatment was initiated for repositioning the left maxillary lateral incisor. A long term, multidisciplinary approach is necessary for the treatment of gemination with talon cusps. (Eur J Dent 2012;6:440-444)

Key words: Talon cusp; gemination; treatment

INTRODUCTION

Gemination is an uncommon anomaly caused by the incomplete attempt of a single tooth bud to form two teeth.[1] Geminated teeth are found more frequently in primary dentition than permanent dentition.[2-4] The prevalence in the latter ranges from 0.07% to 2.1%.[5-7] Maxillary central incisors were found to be the most commonly affected by gemination.[6,7] Gemination causes aesthetic problems, bad positioning, and impaction of adjacent teeth because of the greater volume of the geminated tooth crown.[8]

Talon cusps are also uncommon dental anomalies manifesting as an accessory cusp-like structure projecting from the cingulum area or the cemento-enamel junction of a maxillary or mandibular anterior tooth in either primary or permanent dentition.[9,10] The prevalence of talon cusps in permanent dentition differs among populations, ranging between 0.6% 7.7%.[11-16] The clinical problems associated with talon cusps include food stagnation; caries periapical lesions; tongue irritation; breast feeding problems; compromised aesthetics; occlusal interference, which may lead to accidental cusp fracture; displacement of the affected tooth; dental sensitivity, temporomandib-

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ular joint pain; and periodontal problems because of excessive occlusal force.[10,11,17]

Even though talon cusp may occur in isolation, it may also be associated with other variations in crown anatomy, such as peg-shaped crown, supernumerary teeth, and dens invaginatus.[10,18-22] A talon cusp on a geminated tooth is a very rare finding. Five cases of unilateral geminated teeth with talon cusps[20,23-26] have been reported, and no cases of bilateral geminated teeth with talon cusps have been reported in the literature. This article aims to describe an unusual case of bilateral geminated teeth with talon cusps and the multidisciplinary treatment administered in this case.

CASE REPORT

A 17-year-old boy complained of poor dental aesthetics. He had no history of any severe illness or orofacial trauma, and his physical development appeared normal for his age. Clinical examination revealed that the crowns of his maxillary central incisors were very large (Figure 1). Since he had a normal number of teeth, the shape anomaly of the crowns was attributed to "bilateral gemination." The mesiodistal diameters for the right maxillary incisor and left maxillary central incisor were 12.1 mm and 12.7 mm, respectively. The mesiodistal widths of the crowns were significantly greater in the incisal third than the cole region, which created a fan-like shape. Both central incisors had a distinct groove in the enamel that ran buccolingually. Although the buccolingual groove reached the incisal edge for the left incisor, it finished at around the middle third of the crown for the right incisor. An incisal notch was located in the mesial portion of the incisal edge for the left incisor, but the right incisor had 2 incisal notches on the mesial and distal portions of the incisal edge. The large crowns caused anterior crowding. Both central incisors exhibited pronounced, well-demarcated accessory cusps on the palatal surfaces (Figure 2). The talon cusp was 5.6 mm long, 4.3 mm wide and 4.3 mm thick for the right incisor. For the left incisor, it was 5.9 mm long, 4.7 mm wide and 4.6 mm thick. The anomalous cusp of the right incisor occupied the distal half of the palatal surface. In the left incisor, it was located centrally. Both anomalous cusps extended from the gingival margin to the incisal edges of the crowns and had a Y-shaped outline. There were vertical grooves on the mesial and distal aspects of the talon cusps extending from the base of the cusp to the tip. The talon cusps were classified as Type I (talon). Radiographic and clinical examination showed no carious lesions on the teeth.

Panoramic and periapical radiographs (Figure 3) revealed a V-shaped radiopaque structure superimposed on the image of the affected large crowns. Pulp extensions could be traced to the middle of the anomalous cusps of both teeth. On the periapical radiographs, the pulp chambers and root canals were large in both teeth, but there was only 1 of each.

The patient had skeletal and dental class I malocclusion. During clinical examination, a space requirement of 3 mm was identified in the upper and lower arch.

After clinical and radiographic examinations, management was directed toward eliminating the tongue irritation caused by the talon cusps and improving the aesthetic appearance of the anterior teeth by minimal restorative and orthodontic treatment. To eliminate the source of tongue irritation, the talon cusps in both incisors were gradually reduced using a water-cooled diamond bur on a high-speed hand piece on 2 consecutive sittings held 6-8 weeks apart. The purpose of this period is to allow for the deposition of reparative dentin for

Figure 1. The clinical appearance of very large crowns of maxillary central incisors.

Figure 2. Both central incisors exhibited pronounced, well-demarcated accessory cusps on the palatal surfaces.

pulpal protection and to avoid pulpal exposure. Approximately 1.5 mm of the talon cusps was ground without exposing the pulp. After both grinding procedures, the exposed surface was treated with fluoride gel as a desensitizing agent (Topex Neutral pH, Sultan Healthcare Inc., USA). The distinct enamel grooves running buccolingually on both central incisors were restored with a composite resin, and the aesthetic appearance of anterior teeth was improved (3M Filtek Supreme XT, 3M Espe, USA) (Figure 4). The vertical grooves on the mesial and distal aspects of the talon cusps on the palatal surfaces were obliterated with a flowable composite resin (3M Filtek Supreme XT, 3M Espe, USA). After this minimal restorative treatment, fixed orthodontic treatment was initiated for repositioning of the left maxillary lateral incisors. After the treatment is completed, the aesthetic appearance will be checked again, and if necessary, it will be rearranged.

DISCUSSION

Talon cusp and gemination are relatively rare dental anomalies,[1,9,10] and the bilateral concomitancy of gemination and talon cusp is even more unusual. Two cases of bilateral gemination with talon cusps in the maxillary central incisors have been reported in the literature, but only the right incisors had talon cusps.[26] In the current case, both geminated teeth had talon cusps, and the mesiodistal widths of the teeth were significantly different between the cole region and the incisal thirds of the crowns; the mesiodistal width of the incisal third was significantly greater than that of the cole region. This finding was also different from that in other reported cases in the literature.[20,21,23-26] Because of this appearance, the aesthetic problems were more striking in the present case. The talon cusps in this case were also more pronounced than those in other reported cases. They significantly irritated the patient's tongue but

Figure 3. Radiographic appearance of teeth. The talon cusps are represented by white arrows and the black arrows indicate the traced pulp tissue in talon cusps.

Figure 4. The appearance of teeth after restoration of teeth by composite resin.

Table 1. The presentation of specifications of our case and cases of talon cusp on geminated tooth reported previously.

Reported Cases	Gender and Age of Patient	Unilateral / Bilateral	Affected Tooth / Teeth	Width of Tooth	Width of Talon Cusp	Length of Talon Cusp	Thickness of Talon Cusp	Pulp Structure	Pulp Extension into Talon Cusp
Cullen and Kulbersh-Pangrazio (1985)	8 year-old male	unilateral	right maxillary central incisor	12 mm	not stated	not stated	not stated	single, large pulp chamber and root canal	yes
Al-Omari et al (1999)	8 year-old female	unilateral	right maxillary central incisor	10.4 mm	4,1 mm	5.5 mm	4 mm	single, large pulp chamber and root canal	yes
Gunduz and Acıkgoz (2006)	11 year-old male	unilateral	right maxillary central incisor	not stated	4	3,1	not stated	single, large pulp chamber and root canal	yes
Tomazino et al (2009)	28 year old-female	unilateral	right maxillary central incisor	not stated	not stated	not stated	not stated	single, large pulp chamber and root canal	no
Hattab and Hazza'a (2011)	9 year old-male	unilateral	left maxillary central incisor	11,1	3,3	4,5	3,1	single and large pulp chamber and root canal	yes
Present Case	17 year old-male	bilateral	right and left maxillary central incisors	12.1-and 12.7 mm	4.3 and 4.7 mm	5.6 and 5.9 mm	4.3 and 4.6 mm	single, large pulp chamber and mesial and distal root canal	yes

did not interfere with the occlusion because of the tet-a-tet occlusion of the anterior teeth. In Table 1, the details of previous cases of geminated teeth with talon cusps and our case is presented.

Small talon cusps are usually asymptomatic and require no treatment. However, large prominent cusps, as in our case, may cause problems for the patient and diagnostic and treatment planning difficulties for the dentist.[20] The treatment of talon cusps involves careful clinical judgment and depends on whether the cusp contains or is devoid of a pulp horn. Some reports involving radiographic examination indicated that talon cusps contain pulp horns to varying extents. Pulp extensions could be radiographically traced to the middle of the anomalous cusps in the present case. However, tracing pulpal configuration inside the talon cusp by using radiography is inherently difficult because the cusp is superimposed over the affected tooth crown. Therefore, on the basis of the application used by Al-Omari et al,[20] management was directed toward removing the source of tongue irritation.

Gemination is a developmental aberration that occurs during morphodifferentiation of the tooth bud, which attempts to divide. Because of this aberration, double teeth develop clinically. Fusion is another cause of double teeth but it manifests as a missing tooth. In our patients, tooth number is normal. Therefore, both types of double teeth are identified as gemination. The main complaint of our patient was aesthetic problems related to the anterior teeth. Both his central incisors were very large and fan shaped and lateral incisors were palatinally displaced. After the size and shape of the geminated incisors were reduced and corrected by minimal restorative treatment, fixed orthodontic treatment was initiated to reposition the lateral incisors.

Generally, geminated incisors have a single large pulp chamber and root canal, as in the present case. Tomazinho et al[25] reported a geminated tooth with a single large pulp chamber and mesial and distal root canals that were joined at the apical third. During the root-canal treatment of geminated teeth, the structure of the pulp tissue should be carefully examined by radiographic examination.

In summary, the present case is unique in their clinical presentations and complications. Long term management protocol should be necessary to eliminate the complaints of patients with geminated teeth with talon cusp.

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