



Endodontic Management of Talon Cusp Causing Apical Periodontitis: A Case Report

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Abstract

Talon cusp is a prominent accessory cusp-like structure projecting from the cingulum area or cemento-enamel junction (CEJ) of the maxillary or mandibular teeth in both primary and permanent dentition. Etiology is not known completely but genetic and environmental factors are thought to be effective. The management and treatment outcome of a talon cusp depends on its size, presenting complications and patient cooperation. While smaller in size, it is usually asymptomatic and requires no treatment. However, larger in size it may cause various clinical problems necessitating individualized treatment modalities; thus early diagnosis is important for this anomaly. In this case report a successful endodontic management of a periapical lesion in permanent maxillary central incisor tooth associated with a talon cusp is presented with clinical and radiographic findings.

Keywords: Talon cusp; Dental anomaly; Root canal treatment

Introduction

Talon cusp, which is also defined as dens evaginatus, supernumerary cusp, horn, hyperplastic cingulum, evaginated odontome, cusped cingulum, accessory cusp, and supernumerary lingual tubercle [1-3] is a rare odontogenic developmental dental anomaly projecting from the cingulum area or the cemento-enamel junction (CEJ). It is characterized by an accessory cusp as a projection of the maxillary or mandibular teeth in both deciduous and permanent dentition with normal enamel and dentin containing a varying degree of pulp tissue [2,4-13]. This cusp normally presented in the palatal or occlusal surfaces of the teeth, however, there were some reported cases of talon cusps in labial surfaces of teeth [11]. Although there is no clear etiology for this anomaly; most of authors consider that this anomaly has multifactorial etiology involving both genetic and environmental factors [6,9-11,14]. In dental anomalies frequency of occurrence of this anomaly is less than 1%. It can be observed as an isolated entity or in association with some systemic conditions such as Rubinstein-Taybi syndrome, Mohr syndrome (oral-facial-digital syndrome, type II), Sturge-Weber syndrome (encephalo-trigeminal angiomas), or incontinentia pigmenti achromians [2,3,6,7,10,11,15-19]. Treatment modalities change according to the type of presentation and complications of this anomaly. According to the literature, there are many treatment options range from prophylactic sealing to endodontic treatment methods [11]. Small talon cusps usually don't need treatment. Esthetics may be a major issue if talon cusp is present on labial aspect. On the other hand, large talon cusps frequently cause clinical problems such as; tongue injuries, caries, occlusal interferences, speech and mastication problems, pulpal necrosis, periapical pathosis and periodontal problems necessitating complicated treatment modalities. On literature review, there are several reports presenting concurrence of developmental anomalies with talon cusp in the same tooth [13,20], however only 4 cases of talon cusp teeth with periapical pathosis have been reported [21-24]. The aim of this report is to present a clinical case of the endodontic treatment of a permanent maxillary left central incisor with talon cusp causing periapical pathosis related to occlusal trauma.

Case Presentation

A 45-year-old male patient was referred to the Department of Dentomaxillofacial Radiology School of Dentistry, Ege University, with pain in his upper front teeth for the past 1 week. His medical history was unremarkable, whereas dental history taking revealed that he has had a previous endodontic treatment of maxillary anterior teeth 3 years ago. After receiving informed consent, extraoral and intraoral examinations were implemented. The patient showed a symmetric face without abnormal findings in extraoral examinations. Clinical examination showed no missing tooth but poor oral hygiene. In addition, the presence of an accessory cusp on the palatal aspect of the permanent maxillary left central incisor (tooth 21), extending more than half the distance

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Received Date: 23 Jun 2017

Accepted Date: 31 Aug 2017

Published Date: 08 Sep 2017

Citation:

Gürhan C, Şener E. Endodontic Management of Talon Cusp Causing Apical Periodontitis: A Case Report. J Dent Oral Biol. 2017; 2(13): 1082.

ISSN: 2475-5680

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Figure 1: Intraoral view of maxillary left central incisor with talon cusp.



Figure 2: Panoramic view of the patient.

from the cementoenamel junction (CEJ) to the incisal edge, was observed (Figure 1). Although there was no history of trauma, the left incisor was tender to percussion and showed no response to cold or electric pulp testing. Panoramic and periapical radiograph revealed a triangular, radiopaque shadow superimposed over the middle third of crown of the tooth. Besides, there was a widening of the periodontal ligament space with periapical radiolucency in relation to tooth 21 (Figure 2 and 3). According to the clinical and radiographic findings, a type 1 talon cusp and an symptomatic apical periodontitis were diagnosed associated with maxillary left central incisor and a nonsurgical endodontic treatment of the tooth was scheduled. Endodontic treatment was performed in two sessions. In the first appointment, local anesthesia was administered in order to avoid gingival discomfort when the rubber dam clamp was placed for isolation (Figure 4). Endodontic access cavity was done on the palatal surface by removing the talon cusp and working length was determined with an apex locator (Root ZX; J. Morita, Osaka, Japan). Biomechanical preparation was performed using ProTaper (Dentsply Maillefer) rotary instruments under copious irrigation with 2.5% sodium hypochlorite and 17% ethylenediaminetetraacetic acid. Endodontic treatment was initiated and an intracanal dressing of calcium hydroxide was applied for 2 weeks. After two weeks, the patient returned to the clinic symptom-free and the root canal was obturated by using thermoplastic obturation technique (E&Q plus; Meta Biomed Co Ltd, Cheongju, Korea) and AH26 (Dentsply, USA) as a sealer (Figure 5). The patient was asymptomatic in the six-month follow up.

Discussion

Talon cusp is an uncommon developmental dental anomaly characterized by an accessory cusp-like structure mostly projecting from the cingulum area or cementoenamel junction of anterior teeth [25]. Development of teeth is a complex process, making it more vulnerable for many developmental anomalies either in histodifferentiation or morphodifferentiation stages. The etiology of the talon cusp is not clear, several theories have been suggested



Figure 3: Periapical radiograph showing periapical lesion of maxillary left central incisor with talon cusp.



Figure 4: Periapical radiograph during obturation stage of maxillary left central incisor.



Figure 5: Periapical radiograph of maxillary left central incisor with talon cusp after the endodontic treatment.

for their occurrence. The most accepted hypothesis is that this may be a result of an outfolding of enamel organ or hyperproductivity of the dental lamina during the morphodifferentiation stage of tooth development [18]. Defect occurred during morphodifferentiation stage of odontogenesis, can influence shape and size of the tooth without disturbing the function of ameloblasts and odontoblasts [13,15,17]. To consider this projection as a talon cusp, it must extend at least one millimetre or more beyond CEJ [26]. Hattab et al. [25] classified talon cusps as: type I (talon), a morphologically well-delineated additional cusp that extends at least 50% of the distance from the CEJ to the incisal

edge of the tooth; type II, (semitalon), an additional cusp (≥ 1 mm) that extends to less than half the distance from the CEJ to the incisal edge; and type III (trace talon), an enlarged or prominent cingulum, which occupies less than 25% of the distance from the CEJ to the incisal edge. The talon cusp presented in this case report extended from the cemento-enamel junction to the incisal edge, which may be categorized as a type I or true talon. Maxillary incisors are the teeth commonly affected in permanent dentition and palatal surface is the usual location for this developmental anomaly [6,10,11,13,18]. Studies evaluating the characteristics of talon cusps in different populations showed that there was a slightly higher prevalence in males [7,10]. This case report of a male patient correlates with the literature, since the tooth affected is maxillary central incisor. Radiographically, it appears as a "V" shaped radiopaque structure superimposed onto the normal image of the crown of a tooth. Although this appearance can change in size and shape according to the angle at which the radiograph is taken, similar radiographic finding was observed in our case. There are many radiographic methods to diagnose talon cusp. Two dimensional radiographic techniques (periapical and occlusal radiography, orthopantomography) usually adequate for the correct diagnosis except the cases presenting concurrence of different developmental anomalies with talon cusp in the same tooth. Careful clinical and radiographic examination is necessary for correct diagnosis and treatment planning in such cases. Because of the two-dimensional limitations of conventional radiographs, cone beam computed tomography (CBCT), may be beneficial to provide valuable information to understand the complex anatomy of the crown in such an anomaly [27]. The complications of talon cusp may be examined in several categories such as aesthetic, functional, and pathological. Large and facial talon cusps are the most important aesthetic problems. Small talon cusps are usually asymptomatic. However, large talon cusps may cause functional problems for the patient such as; displacement of teeth, dental mobility, cusp fracture, speech problems and trauma to the lip and tongue. Besides, the occlusal trauma generated by this anomalous cusp can cause pulpal necrosis, periapical pathosis, attrition of the opposing tooth, and periodontal problems due to excessive occlusal forces, as in our case [3,5,7-12,18,19]. Various treatment modalities have been followed for the management of talon cusps according to the type of presentation and complications of talon cusp [11]. Small talon cusps which are asymptomatic require no therapy; while large talon cusps, as in our case, may cause problems for the patient. The treatment of such talon cusps changes depending on the absence/presence of pulpal extensions. Besides, time of diagnosis also changes the prognosis of teeth with talon cusp. In early diagnosis, only gradual grinding can be adequate [28]. However, the present case was diagnosed very late; therefore left central incisor had a symptomatic apical periodontitis and needed endodontic treatment. The access cavity was prepared by completely removing the talon cusp to eliminate the problem of occlusal interference caused by this anomaly.

Conclusion

The case described in this paper includes a case of talon cusp affecting the permanent maxillary left central incisor that caused occlusal trauma and apical pathosis required endodontic treatment caused by premature contact. The present case demonstrates that talon cusp is an anomaly that early diagnosis and treatment are of great importance to avoid complications and to maintain a healthy pulpal and periodontal status.

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