

Talon Cusp: A Literature Review and 3 Case Reports

Senem YIGIT OZER^{1*}

¹Assistant Professor, DDs, PhD. Department of Operative Dentistry and Endodontics, Faculty of Dentistry, Dicle University, Diyarbakir, TURKEY.

Abstract

Talon cusp is an uncommon anomaly seen both in primary and permanent dentition. In most instances they are associated with other clinical problems such as occlusal interferences, poor esthetics and caries susceptibility. Management of such problems requires a detailed knowledge of the clinical entity as well as the problems associated with it. This paper presents three different cases of Talon cusps, discusses possible etiology and treatment techniques.

(*Journal of International Dental and Medical Research 2009; 2: (2), pp. 45-49*)

Keywords: Review, Talon cusp, Treatment, Type.

Received date: 10 May 2009

Accept date: 05 July 2009

Introduction

Talon Cusp (TC) was first recognized by Mitchell in 1892 and is a rare anomaly of the teeth. It mostly resembles an eagle's talon in shape, usually arising from the lingual surface of primary or permanent anterior teeth¹⁻⁶. In canines and incisors, it originates usually in the palatal cingulum as a tubercle projecting from the palatal surface and the anomaly can be rarely detected on the labial surface of the tooth^{7,8}.

The anomalous TC is composed of normal enamel and dentin with varying extensions of pulp tissue. Shay⁹ reported that pulp tissue can extend to the center of the tubercle and, once fractured, the pulp is exposed. TC occurs more frequently in permanent than in the primary dentition. A review of the literature shows that 75% of the cases exhibited TC in their permanent dentition and 25% of the cases in the primary dentition¹⁰. TC is more frequently seen in maxilla than the mandible. The maxillary lateral incisors are the most involved (67%) teeth followed by the central incisors (24%) and canines (9%)¹¹.

Although the exact etiology of the anomaly has not been well defined, it is suggested the TC has a multifactorial etiology combining both genetics and environmental factors^{10,12}. Most of the authors consider that, as with other dental abnormalities, TC

occurs during the morphodifferentiation stage of odontogenesis. Developmentally, they may be a result of an outfolding of the enamel organ or hyperproductivity of the dental lamina¹²⁻¹⁶.

Hattab et al.^{10,11} described a classification system for these anomalous cusps, on the basis of the degree of cusp formation and extension:

Type 1 (Talon) is the structure that projects from the palatal surface of the tooth and extends at least one half the distance from the cemento-enamel junction to the incisal edge.

Type 2 (Semitalon) is the additional cusp with a length of 1 mm or more, but extending less than one half the distance from the cemento-enamel junction to the incisal edge.

Type 3 (Trace talon) is an enlarged and prominent cingulum.

When TC interferes with the normal occlusion, the premature contact caused by the anomalous cusp can generate occlusal trauma and reversible acute apical periodontitis of the opposing tooth and itself. In these cases an occlusal adjustment by grinding the palatal cusp must be performed, with the possibility of exposure of the dentin-pulp complex and, consequently, pulp necrosis¹⁷⁻¹⁹.

Other clinical problems attributed to TC include poor aesthetics, caries, displacement of tooth, periodontal problems, irritation of the tongue and accidental cusp fracture causing pulpal exposure. Clinical management of this anomaly can be very different depending on the size and shape of the affected tooth and on the problems caused by this enlarged cusp^{13-15,20,21}.

This paper presents 3 cases of TC, varying with different types (Type 1, 2 and 3), discusses possible etiology and draws attention to possible complications associated with this anomaly.

*Corresponding author:

Assist. Prof. Dr. Senem YIGIT OZER
Dicle University, Faculty of Dentistry,
Department of Operative Dentistry and Endodontics,
21280 Diyarbakir, TURKEY

GSM: +905324760051

E-mail: senemygt@hotmail.com

CASE REPORT

Case 1: Type 1, Talon

A 8 year old female patient was referred to Dicle University, Faculty of Dentistry, Department of Orthodontics. She had referred to her family dentist with complaint of pain during chewing. Dentist had tried to extract the tooth but due to problems on analgesia, he was unable to finish the process. The edge of the anomaly had broken during the procedure and patient was guided to a specialist by those explained means. Her medical history was non-contributory. No other family members had similar dental anomaly.

Clinical examination revealed Class 1 dental malocclusion in mixed dentition. The maxillary permanent left central incisor was on vestibuloposition and has affected the occlusal relationship anteriorly. Central incisor had a cusp-like lingual projection, sizing 5,1X3,1 mm in length and width which extended almost from the cervical third of the crown to the incisal edge (Fig. 1).



Fig. 1. Cusp-like lingual projection, sizing 5,1X3,1 mm in length and width.

Cusp was separated from rest of crown by noncarious developmental grooves. Clinically, the tooth was asymptomatic and responded normally to pulp vitality tests. Radiographically, no evidence of associated pathosis was found and apexification was not completed (Fig. 2).

It revealed a V-shaped radiopaque cusp like structure with a pulpal extension with it. On the basis of its characteristic features, a diagnosis of TC, Type 1 was made. Because the cusp have effect on the occlusal interference and cause occlusal trauma, a selective cuspal grinding was planned to preserve the tooth vitality and remain apexification.

The treatment lasted 6 months, selective grinding was performed with pear shaped diamond

bur followed by fluoride (Denti-Care, Medicom, NY) application and sealant (Ultraseal XT™, S.Jordan, UT) placement on each visit (Fig. 3).



Fig. 2. No evidence of associated pathosis was found and apexification was not completed.

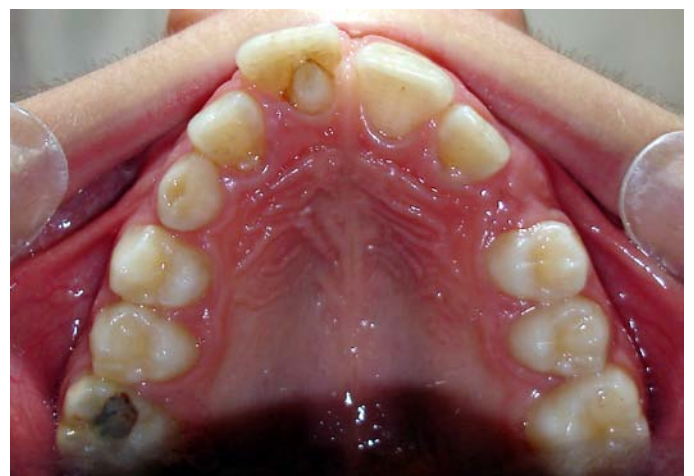


Fig. 3. Grinding level of talon cusp in one session.

Case 2: Type 2, Semitalon

A 40 year old female patient was referred to Dicle University, Faculty of Dentistry, Department of Operative Dentistry and Endodontics. She had tooth decay on maxillary posterior teeth and she was suffering from pain during cold applications. Her medical history was non-contributory. Clinical examination revealed Class 1 dental occlusion and a TC was identified by coincidence. Her maxillary permanent right lateral incisor was on vestibuloposition, having no occlusal contact with its antagonist.

Clinical examination showed no signs of occlusal trauma, carries and pathological change.

The cusp size was extending less than one half the distance from the cemento enamel junction to the incisal edge (Fig. 4).



Fig. 4. The cusp size was extending less than one half the distance from the cemento enamel junction to the incisal edge.

Clinically, the tooth was asymptomatic and responded normally to pulp vitality tests. Radiographically, no evidence of associated pathosis was found and it revealed a V-shaped radiopaque cusp like structure without a pulpal extension (Fig. 5).



Fig. 5. Radiograph revealed a V-shaped radiopaque cusp like structure without a pulpal extension.

On the basis of its characteristic features, a diagnosis of TC, Type 2 was made. Since she had no complaint about the affected tooth, a gradual reduction of the TC was planned for treatment. The treatment lasted 2 months, selective grinding was performed with pear shaped diamond bur followed by fluoride application and sealant (Ultraseal XT™, S.Jordan, UT) placement on each visit to preserve tooth vitality (Fig. 6).



Fig. 6. Level of grinding in the last session.

Case 3: Type 3, Trace talon

A 17 year old male patient was referred to Dicle University, Faculty of Dentistry, Department of Orthodontics. He was suffering from esthetics and he had Class 1 occlusion with moderate crowding anteriorly.

Clinical examination revealed TCs bilaterally on maxillary permanent right and left lateral incisors. He also had dens evagination on maxillary permanent right first premolar (Fig 7).



Fig. 7. Talon cusps Type 3 are seen on maxillary permanent right and left lateral incisors. Note the "dens evagination" on maxillary permanent right first premolar.

His occlusion was within normal limits and he had no history of occlusal trauma. TCs were enlarged and viewed as prominent cingulum.

Clinically, teeth were asymptomatic and responded normal to pulp vitality tests. Radiographically, there were resorption areas apically around maxillary right/ left central/ lateral incisors (Fig. 8,9).



Fig. 8. Detected resorption areas around maxillary permanent right central and lateral incisors.



Fig. 9. Resorption areas are well defined on maxillary permanent left central and lateral incisors due to orthodontic movement.

Laterals revealed a V-shaped radiopaque cusp like structure. On the basis of characteristic features, a diagnosis of TC, Type 3 was made.

Prophylactically, cusps were grinded in the same treatment protocol to prevent malocclusion during orthodontic movement. Orthodontic force applied to central and lateral incisors was reduced to prevent resorption by the orthodontist.

Discussion

TC originates during the morphodifferentiation stage of dental development, but the exact etiology and genesis are unknown. Reports on TCs in family members^{22,23}, twins²⁴, offspring from consanguineous marriages^{10,12,17} and in some genetic syndromes²⁵⁻²⁸ support genetic etiology of the condition. The anomaly appears to be more prevalent in patients with Rubinstein-Taybi syndrome, Mohr syndrome and Sturge-Weber syndrome. Various dental abnormalities in association with TC have been reported like peg shaped lateral incisors, impacted mesiodens, complex odontoma, supernumerary teeth, megadont, dens invaginatus, shovel shaped maxilla incisors, bifid cingula, exaggerated cusps of carabelli^{3,10,22,29,30}.

The common problems associated with TCs are: a) Caries susceptibility b) Occlusal interferences c) Compromised esthetics^{3,10,22,31}. Within the limitations of these problems, conservative treatment techniques can be applied.

The groove between the cusp and the tooth should be prophylactically sealed to prevent decaying³². Deep developmental grooves should be cleaned of debris and plaque, and prophylactically sealed with fissure sealant or treated with excavation and filling in case of caries.

Occlusal interference should be eliminated through gradual occlusal reduction over a period of months to avoid a pulpal exposure, and the tooth surface should be treated with a desensitizing agent^{3,10,32}. Whenever there is occlusal interference, it can lead to rotation or displacement of the tooth or opposing tooth.

If esthetics is effected due to a TC sequential grinding or complete excision of the cusp followed by therapeutic endodontic procedure should be done. However Fabra Campos has reported increased chances of endodontic failure in a case with a palatal gingival groove in maxillary lateral incisor with a TC³³.

Radiographically, the TC is seen as a radiopaque structure, in which the enamel, dentin and occasionally the pulp can be seen. Typically the cusp resembles a V-shaped structure superimposed

over the normal image of the crown^{10,11}. A definitive diagnosis of a TC cannot be made based only on the radiographic findings alone because a TC on an unerupted tooth may be radiographically misinterpreted as a supernumerary tooth, compound odontoma or dens in dente^{29,30}.

In case of finding a TC, taking of an orthopantomogram is recommended for exclusion of association with other abnormalities.

Conclusions

Early diagnosis and treatment are needed to avoid possible complications. Procedures briefly told here can be manipulated for the treatment of TC if they are causing trauma and esthetic problems:

- 1- Selective cuspal grinding of accessory cusp over a 6-8 week interval with application of fluoride as a desensitizing agent, so that it will avoid possibility of pulpal exposure and helps in reparative dentin formation.
- 2- If the affected tooth is immature and if there is pulpal pressure, complete reduction of cusp can be a choice for treatment.
- 3- Root canal treatment should be done if complete cuspal reduction is considered.

References

1. Mitchell WH. Case report. Dental Cosmos 1892;34: 1036.
2. Mellor JK, Ripa LW. Talon cusp: a clinically significant anomaly. Oral Surg Oral Med Oral Pathol 1970;29:225-8.
3. Mader CL. Talon cusp. J Am Dent Assoc 1981;103: 244-6.
4. Salama FS, Hanes CM, Hanes PJ, Ready MA. Talon cusp: a review and two case reports on supernumerary primary and permanent teeth. ASDC J Dent Child 1990;57: 147-9.
5. Lomali G, Hazar S, Altinbulak H. Talon cusp: Report of five cases. Quintess Int 1994;25: 431-3.
6. Dankner E, Harari D, Rotstein I. Dens evaginatus of anterior teeth. Literature review and radiographic survey of 15,000 teeth. Oral Surg Oral Med Oral Pathol 1996;81: 472-6.
7. Jowharji N, Noonan RG, Tylka JA. An unusual case of dental anomaly: a 'facial' talon cusp. ASDC J Dent Child 1992;59:156-8.
8. Abbott PV. Labial and palatal 'talon cusps' on the same tooth. A case report. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1998;85:726-30.
9. Shay JC. Dens evaginatus. A case report of a successful treatment. J Endod 1984;7:324-6.
10. Hattab FN, Yassin OM, Al Nimri KS. Talon cusp in permanent dentition associated with other dental anomalies: review of literature and reports of seven cases. ASDC J Dent Child 1996;63:368-76.
11. Hattab FN, Yassin OM, Al Nimri KS. Talon cusp-clinical significance and management: case reports. Quintess Int 1995;26:115-20.
12. Al-Omari, Hattab FN, Darwazeh MG, Dummer PM. Clinical problems associated with unusual cases of talon cusp. Int Endod J 1999; 21:183-90.
13. Güngör HC, Altay N, Kaymaz FF. Pulpal tissue in bilateral talon cusps of primary central incisors. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2000;89:231-5.
14. McNamara T, Haeussler AM, Keane J. Facial talon cusp. Int J Paediatr Dent 1997;7:255-8.
15. Segura-Egea JJ, Jimenez-Rubio A, Velasco-Ortega E, Ri'os-Santos JV. Talon cusp causing occlusal trauma and acute apical

- periodontitis: report of a case. Dent Traumatol 2003;19:55-9.
16. Hattab FZ, Hazza AM. An unusual case of talon cusp on geminated tooth. J Can Dent Assoc 2001;67:263-6.
17. Segura JJ, Jimenez-Rubio A. Talon cusp affecting permanent maxillary lateral incisors in 2 family members. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1999;88:90-2.
18. Soares AB, De Araujo JJ, De Sousa MG, Veronezi MC. Bilateral talon cusp: case report. Quintess Int 2001;32:283-6.
19. Ferraz JAB, Carvalho JR Jr, Saquy PC, Pecora JD, Sousa- Neto MD. Dental anomaly: dens evaginatus (talon cusp). Braz Dent J 2001;12:132-4.
20. De Sousa SMG, Tavano SMR, Bramante CM. Unusual case of bilateral talon cusp associated with dens evaginatus. Int Endod J 1999;32:494-8.
21. Hattab FZ, Yassin OM, Sasa IS. Oral manifestations of Ellis-van Creveld syndrome: report of two siblings with unusual dental anomalies. J Clin Pediatr Dent 1998;22:159-65.
22. Davis PJ, Brook AH. The presentation of talon cusp: diagnosis, clinical features, associations and possible aetiology. Br Dent J. 1986;160:84-8.
23. Meon R. Talon cusp in two siblings. N Z Dent J. 1990;86:42-4.
24. Liu JF, Chen LR. Talon cusp affecting the primary maxillary central incisors in two sets of female twins: report of two cases. Pediatr Dent. 1995;17:362-4.
25. Gardner DG, Girgis SS. Talon cusps: A dental anomaly in the Rubinstein-Taybi syndrome. Oral Surg 1979;47:519-21.
26. Hennekam RC, Van Doorne JM. Oral aspects of Rubinstein-Taybi syndrome. Am J Med Genet Suppl. 1990;6:42-7.
27. Goldstein E, Medina JL. Mohr syndrome or oral-facial-digital II: report of two cases. J Am Dent Assoc. 1974;89:377-82.
28. Tsutsumi T, Oguchi H. Labial talon cusp in a child with incontinentia pigmenti achromians: case report. Pediatr Dent. 1991;13:236-7.
29. Natkin E, Pitts DL, Worthington P. A case of talon cusp associated with other odontogenic abnormalities. J Endod 1983;9:491-5.
30. Lehl GK. Talon cusp associated with other dental anomalies - A case report. J Ind Soc Pedo Prev Dent 1999;17:13-4.
31. Hsu Chin-Ying S, Girija V, Fei YJ. Bilateral Talon Cusps in Primary Teeth: Clinical significance and treatment. J Dent Child 2001;68:239-43.
32. Myers CL. Treatment of a talon-cusp incisor: report of a case. J Dent Child 1980;47:43-5.
33. Fabra-Campos H. Failure of endodontic treatment due to a palatal gingival groove in a maxillary lateral incisor with talon cusp. J Endod 1990;16:342-5.