

CT Scan Investigation for an Unusual Presentation of Talon Cusp in Fused Mandibular Permanent Tooth

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Abstract Background: Talon cusp is a rare anomaly projecting from the dento-enamel junction to a variable distance towards the incisal edge of an anterior tooth. Hyperactivity of the enamel organ during morphodifferentiation has been accredited to its formation. When it occurs, the effects are mainly aesthetic and functional and so early detection and treatment is essential in its management to avoid complications. **Case presentation:** An unusual case of talon cusp on the lingual aspect of a mandibular central incisor with fusion is reported. **Conclusion:** The management and treatment outcome of talon cusp depends on the size, presenting complications and patient cooperation.

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1. Introduction

Talon cusp is a dental anomaly which presents rarely in the routine clinical practice. It is an accessory cusp-like structure which projects from the cingulum area or cemento-enamel junction of maxillary or mandibular anterior teeth in both primary and permanent dentitions [1,2]. It was first described by Mitchell in 1892 [3] and thereafter named as Talon cusp by Mellor and Ripa [4] due to its resemblance to an eagle's talon. This relatively rare anomaly has a high prevalence rate of 92% in primary dentition compared to that of 75% in permanent dentition.⁵The maxillary lateral incisor is the most frequently affected in the permanent dentition while the maxillary central incisor is the most affected in the primary dentition [5]. Most often it occurs unilaterally with a higher predilection in males [1]. The exact aetiology is unknown, but it is suggested to be a combination of genetic and environmental factors [2,6]. It is believed that the anomaly might occur during the morphodifferentiation stage of tooth development as a result of outfolding of enamel organ or hyper productivity of dental lamina [7]. Due to wide variation in the size and shape of the Talon cusp, Hattab et al classified it into 3 types based on the size and shape of the talon cusp [2].

Type 1: Talon – refers to a morphologically well-delineated additional cusp that prominently projects from the palatal (or facial) surface of a primary or permanent anterior tooth and extends at least half the distance from the cemento-enamel junction to the incisal edge.

Type 2: Semi talon – refers to an additional cusp of a millimetre or more extending less than half the distance from the cemento-enamel junction 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 cingula and their variations, i.e. conical, bifid or tubercle-like.

Fusion and gemination describe joined teeth. It is difficult to differentiate between gemination and fusion. In fusion there is union of two or more teeth and the teeth count is usually less. [8] It occurs during embryonic development and hence results in a larger size tooth. McDonald stated that gemination is "the attempted division of single tooth germ by invagination during the growth cycle." [9] The total number of teeth in the dentition will be normal and the radiograph will show one root and one pulp space with two partially or totally separated crowns. Kelly proposed that the two halves of the crown in gemination are usually mirror images whilst in fusion it manifests with distinct difference in the two halves of the crown. [10] Talon cusp on a fused or geminated permanent tooth is a rare entity.

Conventional intraoral periapical radiographs are an important investigative tool in dentistry. Nevertheless, it is not completely reliable owing to its inherent limitations [11], especially in dental anomalies, such as fused, geminated or talon cusp teeth. Radiographically, it may appear typically as a V-shaped radiopaque structure, as in true talon or semi-talon, or be tubercle-like, as in trace talon, originating from the cervical third of the root. The radiopaque V-shaped structure is superimposed over the normal image of the crown of the tooth. The point of the 'V' is inverted in mandibular cases. This appearance varies with the shape and size of the cusp, and the angle at which the radiograph is taken.

These limitations might be overcome by using advanced diagnostic methods such as spiral computed tomography (SCT) which can produce 3-dimensional (3D) images of individual teeth and the surrounding tissues.

This case report is about an unusual presentation of talon cusp on lingual aspect of a fused permanent mandibular anterior tooth on the lingual aspect.

2. Case Report

A 37-year-old male patient reported to the Department of Periodontics, Tagore Dental College & Hospital, Chennai for routine oral prophylaxis. Oral examination revealed 14 maxillary teeth and 14 mandibular teeth. Patient had extracted his lower left second premolar tooth three years back due to caries.

Clinically, the mandibular left central incisors (teeth # 31, 32) revealed abnormal crown morphology with an increased mesiodistal width of 9 mm. Moreover, the tooth had a well defined and prominent accessory cusp on the lingual aspect projecting from the cemento-enamel junction in the middle of the fused incisors. The cusp was pyramidal in shape and measured 5 mm in length from the gingulum. The tooth was not sensitive to palpation or percussion and presented no occlusal interference. The patient did not present any family history of this anomaly and that there had been no occurrence in the deciduous dentition or a history of trauma.

Panoramic and periapical radiograph showed an inverted V-shaped superimposed radiopaque structure extending from the crown through the incisal edge of the fused tooth. A large pulp chamber and a single large root was observed in the fused tooth but there was no pulp tissue extending into the accessory cusp radiographically.

To ascertain the anatomy and exact nature of the talon cusp in a three-dimensional manner, spiral computed tomography imaging was done. The involved tooth was focused and the morphology was obtained in transverse, axial and sagittal sections of 0.25mm slice thickness. The images revealed that the mandibular central incisor had a single large pulp chamber with single root canal. The SCT confirmed the absence of pulpal tissue in the accessory cusp and the tooth dimensions were correlated with the clinical measurement (Figure 1 & Figure 2).

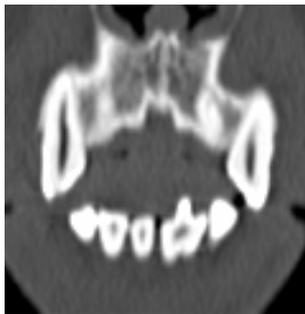


Figure 1. CT section showing the talon cusp on fused teeth 31 & 32



Figure 2. CT section showing two separate pulp chambers with fused crowns

On the basis of clinical, radiographic and SCT findings, a diagnosis of Type I (Hattab et al) [1] talon cusp in fused permanent mandibular incisors has been established.

3. Discussion

Reported cases of mandibular talon cusps are quite rare in literature. Moreover, a talon cusp in a fused tooth is very uncommon. It is agreed that it is more common in maxillary teeth.

Reported cases of mandibular talon cusps

| Author | Tooth type | Tooth surface |
|----------------------------------|----------------|---------------|
| Goel et al, 1976 [12] | Mandibular R 1 | Lingual |
| Mader, 1982 [13] | Mandibular R 1 | Lingual |
| Falomo, 1985 [14] | Mandibular R 2 | Lingual |
| McNamara et al, 1997 [15] | Mandibular R 1 | Facial |
| Hegde and Kumar, 1999 [16] | Mandibular L b | Lingual |
| | Mandibular L 1 | Lingual |
| Nadkarni et al, 2002 [17] | Mandibular R 1 | Lingual |
| Dash et al, 2004 [18] | Mandibular R 1 | Lingual |
| Llena-Puy and Navarro, 2005 [19] | Mandibular L 2 | Facial |
| Oredugba [20] | Mandibular L 1 | Facial |

Fused or geminated teeth has been referred in a neutral term, such as “double teeth” [8] and the distinguishment between them always poses a clinical difficulty [10,11]. Several clinical and radiographic criteria are used to distinguish fusion from gemination. Fusion is the incomplete attempt of two tooth buds to fuse into one, whereas gemination is the incomplete attempt of one tooth bud to divide into two. Clinically when the joined teeth are counted as one, a full complement of teeth usually means that the phenomenon represents gemination; less than full complement of teeth usually indicates fusion. Radiographically, the distinction can be made in the difference in the root configuration. In case of fusion there are usually two separate canals, whereas in gemination there is usually one large common root canal. [12,13] In the present case, CT sections revealed individual pulp chambers confirming the present case as fusion.

The present case is representation of Type I talon cusp with absence of pulpal tissue in the talon. Radiograph was taken to confirm the pulpal pathology. However, radiographic tracing of pulpal configuration inside the talon cusp has inherent difficulties because the cusp is superimposed over the affected tooth crown [22]. Spiral Computed Tomography has been used successfully in clinical dentistry for the confirmatory diagnosis of morphologic aberrations in the root canal anatomy [23,24,25,26], and it provides a better, more accurate, and faster diagnostic method three-dimensionally. The CT section of the present case reveals the fused crowns of teeth # 31 and #32 with individual pulp chambers confirming it as fusion. Normal intraoral periapical x-rays do aid in diagnostics but in cases of talon there might be superimposition of the dental structure on the labial aspect which will obscure the complete details of the talon cusp. Computerised Tomography scan gives fine details of the talon cusp in every cross section from the tip to the incisal tip of the tooth. CT scan confirmed the fusion of the cusps of teeth #31 and #32 alone with the presence of talon without pulpal tissue in it.

Management of talon cusps include no treatment, [27,28] sequential grinding, [29] pit and fissure sealants, [30] pulp therapy, [31] restorative treatment, full crown coverage [32] and extraction of the affected tooth [33]. The talon cusp should be treated only if it is associated with problems such as compromised aesthetics, occlusal

interference, tooth displacement, caries, periodontal problems or irritation of the soft tissues during speech or mastication [34,35,36]. In our reported case the tooth was asymptomatic with no periodontal or endodontal involvement. The tooth was not esthetically compromised. Hence the patient did not require any invasive treatment procedures. Routine oral prophylaxis was done and emphasis was given in educating the patient about oral hygiene measures as the presence of talon cusp could predispose to plaque accumulation. Patient was recalled after six months and reviewed. The patient did maintain his oral hygiene and there were no other complications. Further recall visits were scheduled for every six months.

4. Conclusion

The management and treatment outcome of talon cusp depends on the size, presenting complications and patient cooperation. Spiral computed tomography provides information in cross sections at different distances and anomalies can be assessed from the root apex to crown level accurately. Oral prophylaxis and routine follow up was done for this patient as there was no presenting esthetic complaints and no interference to occlusion or pulpal involvement in relation to talon cusp. A thorough perception of these rare dental anomalies and their associated problems are important to aid in diagnosis, provide prophylactic and therapeutic measures, thereby preventing or minimizing possible complications which can compromise on esthetics and function of the dentition.

References

- [1] Hattab FN, Yassin OM, Al-Nimri KS. Talon cusp – Clinical significance and management: Case reports. *Quintessence Int.* 26 (2): 115-120. Feb 1995.
- [2] 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. *J Dent Child* 63: 368-376. 1996.
- [3] Mitchell WH: Letter to the editor. *Dental Cosmos*34: 1036. 1892.
- [4] Mellor JK, Ripa LW. Talon cusp: a clinically significant anomaly. *Oral Surg*29: 225-228. 1971.
- [5] Danker 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 Oral Radiol and Endod* 81: 472-476. 1996.
- [6] Segura JJ, Jimenez-Rubio A. Talon cusp affecting permanent maxillary lateral incisors in 2 family members. *Oral Surg Oral Med Oral Pathol Oral Radiol and Endod* 88: 90-92. 1999.
- [7] Sicher S, Bhasker SN, Orban S. *Oral Histology and Embryology. 7th edition. St Louis, MO: CV Mosby Co; 1972.*
- [8] Pindborg JJ. Pathology of the dental hard tissues. Philadelphia: W. B. Saunders Co. P. 47-55. 1970.
- [9] Mc Donald RE. Dentistry for children and Adolescent. Saint Louis: C. V. Mosby Co. p36. 1974.
- [10] Kelly JR. Gemination, Fusion or Both? *Oral Surg* 45: 655-6. 1978.
- [11] Duncan WK, Helpin ML. Bilateral fusion and gemination: a literature analysis and case report. *Oral Surg Oral Med Oral Pathology* 64: 82-7. 1987
- [12] Pindborg JJ. Pathology of the dental hard tissues. Philadelphia: W.B. Saunders; 1970.
- [13] Pineda F, Kuttler Y: Mesiodistal and buccolingual roentgenographic investigation of 7,275 root 32 canals. *Oral Surgery, Oral Medicine and Oral Pathology*, 33(1): 101-110. 1972.
- [14] de Siqueira VC, Braga TL, Martins MA, Raitz R, Martins MD. Dental fusion and dens evaginatus in the permanent dentition: literature review and clinical case report with conservative treatment. *J Dent Child* 1: 69-72. 2004.
- [15] Danesh G, Schrijnemakers T, Lippold C, Schäfer E. A fused maxillary central incisor with dens evaginatus as a talon cusp. *Angle Orthod* 77: 176-180. 2007.
- [16] Goel VP, Rohtagi VK, Kaushik KK. Talon cusp: a clinical study. *J Indian Dent Ass*48: 425-427. 1976.
- [17] Mader CL. Mandibular talon cusp. *J Am Dent Ass*105: 651-653. 1982.
- [18] Falomo OO. Talon cusp: a case report. *Odonto-stomatol Trop*6: 207-208. 1983
- [19] McNamara T, Haeussler AM, Keane J. Facial talon cusps. *Int J Paed Dent*7: 259-262. 1997.
- [20] Hegde S, Kumar BR. Mandibular talon cusps: report of two cases. *Int J Paed Dent* 9: 303-306. 1999.
- [21] Nadkarni UM, Munshi A, Damle SG. Unusual presentation of talon cusp: two case reports. *Int J Paed Dent* 12: 332-335. 2002.
- [22] Dash JK, Sahoo PK, Das SN. Talon cusp associated with other dental anomalies: a case report. *Int J Paed Dent* 14: 295-300. 2004.
- [23] Llena-Puy MC, Forner-Navarro L. An unusual morphological anomaly in an incisor crown. Anterior dens evaginatus. *Med Oral Patol Oral Cir Buccal*10: 13-16. 2005.
- [24] Folakemi A Oredugba. Mandibular facial talon cusp: Case report *BMC Oral Health* 5: 92005.
- [25] Ballal S, Sachdeva GS, Kandaswamy D. Endodontic management of a fused mandibular second molar and paramolar with the aid of spiral computed tomography: a case report. *J Endod*33: 1247-51. 2007.
- [26] Robinson S, Czerny C, Gahleitner A, Bernhart T, Kainberger FM. Dental CT evaluation of mandibular first premolar root configurations and canal variations. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*93: 328-32. 2002.
- [27] Sponchiado EC Jr., Ismail HA, Braga MR, de Carvalho FK, Simoes CA. Maxillary central incisor with two root canals: a case report. *J Endod*32: 1002-4. 2006.
- [28] Gopikrishna V, Bhargavi N, Kandaswamy D. Endodontic management of a maxillary first molar with a single root and a single canal diagnosed with the aid of spiral CT: a case report. *J Endod*32: 687-91. 2006.
- [29] Gopikrishna V, Rueben J, Kandaswamy D. Endodontic management of a maxillary first molar with two palatal roots and a single fused buccal root diagnosed with spiral computed tomography: a case report. *Oral Surg Oral Med Oral Pathol.* 105(4): e74-8. Apr 2008.
- [30] Mader CL. Talon cusp. *JADA* 103: 244-6. 1981.
- [31] Chen RJ, Chen HS. Talon cusp in primary dentition. *Oral Surg Oral Med Oral Pathol* 62: 67-72. 1986.
- [32] Myers LC Treatment of a talon cusp incisor: report of case. *J Dent Child* 47: 119-21. 1980.
- [33] Morin CK. Talon cusp affecting the primary maxillary central incisor: report of case. *J Dent Child* 54: 283-5. 1987.
- [34] Mellor JK, Ripa LW. Talon cusp: a clinically significant anomaly. *Oral Surg Oral Med Oral Pathol* 29: 225-8. 1970.
- [35] Rantanen AV. Talon cusp. *Oral Surg Oral Med Oral Pathol* 32: 398-400. 1971.
- [36] Gungor HC, Altay N, Kaymaz FF. Pulpal tissue in bilateral talon cusps of primary central incisors. Report of a case. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 89: 231-5. 2000.