CASE REPORT

Bilateral dens evaginatus (talon cusp) in permanent maxillary lateral incisors: a rare developmental dental anomaly with great clinical significance

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SUMMARY

Talon cusp is an accessory cusp-like structure which projects from the cingulum area or cemento-enamel junction. It is important for dentists to be aware of the potential complications that may occur with talon cusp. Early diagnosis and treatment is important, especially to prevent pulpal complications in permanent teeth which may be in developing stage in paediatric patients. The purpose of this paper is to report a case of bilateral talon cusp in permanent maxillary lateral incisors. Associated dental anomalies and clinical problems are discussed along with successful management of the case with conservative therapy.

BACKGROUND

This paper has described a case of talon cusp which is a relatively rare dental anomaly of great clinical significance. Associated dental anomalies and clinical problems are discussed along with successful management of the case with conservative therapy. Early diagnosis and treatment is important, especially to prevent pulpal complications in permanent teeth which may be in developing stage in paediatric patients.

CASE PRESENTATION

A 13-year-old boy presented with occlusal interference. His medical and dental histories were unremarkable and the family history did not reveal any evidence of hereditary dental anomalies. Intraoral examination showed a permanent dentition with class I molar relationship. The maxillary permanent lateral incisors exhibited pronounced cusp-like structure on the palatal surface projecting from the cingulum area with the tip towards the incisal edge (figures 1 and 2). This anomalous cusp extended more than half the distance on the palatal surface

Figure 1 An intraoral view showing bilateral type 1 talon cusp on the palatal surface of the maxillary lateral incisors (mirror view).

Figure 2 Cast of the patient showing bilateral talon cusp on the palatal surface of the maxillary lateral incisors.

of the left lateral incisor while on the right lateral incisor it extended completely till the incisal edge. These projecting cusps were causing occlusal interference and the developmental grooves on the lateral sides of this cusp were carious. A diagnosis of the talon cusp was made.

INVESTIGATIONS

Periapical radiographs of the lateral incisors showed a V-shaped radiopaque structure superimposed on the image of the affected crown, with the point of the 'V' towards the incisal edge (figures 3 and 4).

TREATMENT

It was decided to reduce the talon cusp to eliminate occlusal interference. The patient was scheduled to complete reduction of the talon cusp in four consecutive appointments 6–8 weeks apart to allow deposition of reparative dentine for pulpal protection. The ground surface was treated with fluoride varnish (Duraphat, Woelm Pharma Co, Eschwege, Germany), as a desensitising agent at each visit. Resin-modified glass-ionomer restorations were placed after removing caries from the grooves at the lateral aspects of the talon cusp (figure 5).

OUTCOME AND FOLLOW-UP

The patient was recalled for follow-up after 3, 6 and 12 months. On follow-up visits, the patient was asymptomatic.

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Figure 3 An intraoral periapical radiograph of the left maxillary lateral incisor depicting the talon cusp with classic V-shaped radiopacity.

DISCUSSION

Dens evaginatus is an odontogenic developmental anomaly that can be defined as a tubercle or protuberance from the involved surface of the affected tooth consisting of an outer layer of enamel, a core of dentine, which may contain a slender extension of pulp tissue.¹ Dens evaginatus has also been referred to as: the simplest type of dilated composite odontoma, occlusal tubercle, Leong's premolar, tuberculated premolar, odontomas

Figure 4 An intraoral periapical radiograph of the right maxillary lateral incisor showing the talon cusp extending till the incisal edge.

Figure 5 Postoperative image after talon cusp reduction and restoration of carious grooves.

of axial core type, evaginated odontoma, occlusal enamel pearl and talon cusp.²⁻⁶ It may occur in the form of a drop, a pointed or cylindrical cone on the occlusal surface of the posterior teeth, while in the anterior teeth a conically shaped extension of the cingulum is observed.^{3,6}

Talon cusp originated as a descriptive term for dens evaginatus when observed on the anterior teeth. Windle and Humphreys⁷ first reported this uncommon anomaly by mentioning two cases of supernumerary cusps on the palatal surface of permanent maxillary incisors and canines. Later, Mitchell⁸ documented this morphological variant in the modern dental literature as a curved horn-like process extending from the palatal surface to the incisal edge of a permanent maxillary central incisor of a female patient. Mellor and Ripa⁹ coined the term 'talon cusp' because of its resemblance to an eagle's talon. Most authors agree that both (talon cusp and dens evaginatus) are the result of an exacerbation of the same phenomena during the morphodifferentiation stage of tooth development.¹⁰ The talon cusp or dens evaginatus of anterior teeth, is a relatively rare developmental anomaly characterised by the presence of an accessory cusp-like structure or tubercle projecting from the cingulum area or cemento-enamel junction of the maxillary or mandibular anterior teeth in both the primary and permanent dentition. This anomalous structure is composed of normal enamel and dentine and either has varying extensions of pulp tissue into it or is devoid of a pulp horn.^{9,11-13} In its typical shape, the anomaly resembles an eagle's talon,⁹ but it could also present as pyramidal, conical or teat like.^{9,11-14} Davis and Brook¹³ defined talon cusp as an additional cusp that prominently projects from the lingual surface of primary or permanent anterior teeth, is morphologically well delineated, and extends at least half the distance from the cemento-enamel junction to the incisal edge.

The reported prevalence of talon cusp varies considerably between ethnic groups, ranging from 0.06% in Mexican children¹⁵ to 7.7% in North Indian children.¹⁶ The permanent dentition is affected more frequently than the primary dentition, and the anomaly is more common in men than in women.^{10,11,13,14,17} The higher male predilection may suggest a sex-linked genetic component in the aetiology of talon cusp in the primary dentition. Almost 92% of the affected (taloned) teeth in the permanent dentition have been found in the maxilla.

The aetiology of talon cusp is not well understood, but appears to have both genetic and environmental components.^{11,13} Talon cusp has been thought to arise as a result of an

outward folding of a portion of the inner enamel epithelium and a transient focal hyperplasia of subjacent ectomesenchymal cells of the dental papilla.¹⁴ The aberrant hyperactivity of the dental lamina may also be responsible for its occurrence.¹⁸

The talon cusp can occur as an isolated finding or in association with other dental anomalies such as shovel-shaped lateral incisors, agenesis or impacted canines, mesiodens, complex odontomes, gemination, macrodontia, dens evaginatus of posterior teeth, peg-shaped lateral incisors, dens invaginatus and an exaggerated Carabelli's cusp.^{11 15 19–22} The talon cusp has not been reported as an integral part of any specific syndrome, although it appears to be more prevalent in patients with Sturge-Weber syndrome,¹⁷ Mohr syndrome,²⁰ Rubinstein-Taybi syndrome,²¹ incontinentia pigmenti achromians²² and Ellis-van Creveld syndrome.²³

On the basis of the degree of formation and extension of talon cusp, this anomaly can be classified as—talon, semitalon and tracetalon.¹¹ Small talon cusps are usually asymptomatic and need no treatment. Large talon cusps may cause clinical problems, including occlusal interference, displacement of the affected tooth, irritation of the tongue during speech and mastication, carious lesion in the developmental grooves that delineate the cusp, pulpal necrosis, periapical pathosis, attrition of the opposing tooth and periodontal problems due to excessive occlusal forces.^{9 11–14}

Most cases of talon cusps need definitive treatment. The developmental grooves at the lateral aspects of the anomalous cusps are susceptible to caries. Deep, non-carious grooves and fissures should be cleaned of debris and plaque and prophylactically sealed with a fissure sealant.¹¹ If the grooves are carious, the lesion should be eradicated and the cavity filled with an appropriate restorative material. Occlusal interference is often a problem with talon cusps, particularly those occurring in the maxilla.^{9 11 24 25} In cases of premature contact and occlusal interference, the anomalous cusp should be reduced. The treatment of talon cusp involves careful clinical judgement and review of whether the cusp contains or is devoid of a pulp horn. However, radiographic tracing of the pulpal configuration inside the talon cusp has inherent difficulties because the cusp is superimposed over the affected tooth crown. If the treatment requires the removal of a substantial portion of the cusp, the reduction should then be gradual and on consecutive visits, at 6-week to 8-week intervals, to allow deposition of reparative dentine for pulpal protection.^{11 24}

In the present case, the authors treated the anomaly by gradual periodic grinding of the entire palatal surface of the talon cusp to encourage the development of reparative dentine followed by the application of a fluoride varnish. The carious developmental grooves were restored with resin-modified glass ionomer.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- Oehlers FAC, Lee KW, Lee EC. Dens evaginatus, its structure and responses to external stimuli. *Dent Pract Dent Rec* 1967;17:239–44.
- Tratman FK. An unrecorded form of the simplest type of dilated composite odontome. *Br Dent J* 1949;86:271–5.
- Merrill RG. Occlusal anomalous tubercles on premolars in Alaskan Eskimos and Indians. *Oral Surg Oral Med Oral Pathol* 1964;17:484–96.
- Lau TC. Odontomes of the axial core type. *Br Dent J* 1955;99:219–25.
- Oehlers FAC. The tuberculated premolar. *Dent Pract Dent Rec* 1956;6:144–8.
- Shey Z, Eytel R. Clinical management of an unusual case of dens evaginatus in a maxillary central incisor. *J Am Dent Assoc* 1983;106:346–8.
- Windle BCA, Humphreys J. Extra cusps on the human teeth. *Anat Anz* 1887;2:13–16.
- Mitchell WH. Letter to editor. *Dent Cosmos* 1892;34:1036.
- Mellor JK, Ripa LW. Talon cusp: a clinically significant anomaly. *Oral Surg Oral Med Oral Pathol* 1970;29:225–8.
- 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 Oral Radiol Endod* 1996;81:472–5.
- Hattab FN, Yassin OM, al-Nimri KS. Talon cusp in permanent dentition associated with other dental anomalies: review of literature and report of seven cases. *ASDC J Dent Child* 1996;63:368–76.
- Mader CL. Talon cusp. *J Am Dent Assoc* 1981;103:244–6.
- Davis PJ, Brook AH. The presentation of talon cusp: diagnosis, clinical features, associations and possible etiology. *Br Dent J* 1986;160:84–8.
- Hattab FN, Yassin OM, al-Nimri KS. Talon cusp—clinical significance and management: case reports. *Quintessence Int* 1995;26:115–20.
- Sedano HO, Carreon Freyre I, Garza de la Garza ML, et al. Clinical orodental abnormalities in Mexican children. *Oral Surg Oral Med Oral Pathol* 1989;68:300–11.
- Chawla HS, Tewari A, Gopalakrishnan NS. Talon cusp: a prevalence study. *J Indian Soc Pedod Prev Dent* 1983;1:28–34.
- Chen RJ, Chen HS. Talon cusp in primary dentition. *Oral Surg Oral Med Oral Pathol* 1986;62:67–72.
- Rantanen AV. Talon cusp. *Oral Surg Oral Med Oral Pathol* 1971;32:398–400.
- Al-Omari , Hattab FN, Darwazeh MG, et al. Clinical problems associated with unusual cases of talon cusp. *Int Endod J* 1999;21:183–90.
- Goldstein E, Medina JJ. Mohr Syndrome or oral-facial-digital II; report of 2 cases. *J Am Dent Assoc* 1974;89:377–82.
- Gardner DG, Girgis SS. Talon cusp, a dental anomaly in the Rubenstein-Taybi syndrome. *Oral Surg Oral Med Oral Pathol* 1979;47:519–21.
- Tsutsumi T, Oguchi H. Labial talon cusp in a child with incontinentia pigmenti achromians: case report. *Pediatr Dent* 1991;13:236–7.
- Hattab FN, 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.
- Hattab FN, Yassin OM. Bilateral talon cusps on primary central incisors: a case report. *Int J Paediatr Dent* 1996;6:191–5.
- Myers CL. Treatment of a talon cusp incisor: report of case. *J Dent Child* 1980;47:119–21.

Learning points

- It is important for clinicians to be aware of the potential complications that may occur with talon cusp.
- Early diagnosis and treatment is important especially during the patient's formative years.
- Treatment objectives for talon teeth should include: (1) preserving pulpal vitality, (2) meeting aesthetics and occlusal requirements, (3) establishing caries prevention or eradication in developmental grooves and (4) eliminating tongue irritation.

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