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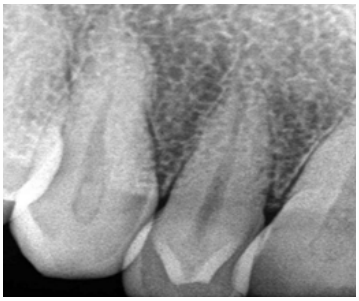

Artificial Intelligence in Orthodontics

Talon Cusps: Conservative management

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Talon Cusp: An uncommon occlusal anomaly – conservative management of two cases.

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Abstract

Talon cusp, a rare dental anomaly characterized by an extra cusp-like structure on anterior teeth, poses significant clinical challenges. This report presents two cases of talon cusp affecting maxillary central incisors, highlighting their clinical implications and successful conservative management.

The cases illustrate distinct complications, including premature contact, articulation difficulties, inadequate mouth closure, food impaction, and patient discomfort. A thorough literature review reveals variability in prevalence, etiology, and classification systems, underscoring the importance of radiographic evaluation and multidisciplinary approaches.

This report emphasizes the importance of early diagnosis and intervention to prevent complications and ensure optimal oral function and patient comfort. Conservative management strategies, including restorative and minor surgical interventions, are discussed, highlighting the potential for successful outcomes without extensive treatment.

Keywords: Talon Cusps, Problems, unilateral anomalous cups, conservative treatment

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ORIGINAL ARTICLE

Introduction

Talon Cusp, relatively rare developmental anomalies, present as accessory cusps resembling an eagle's talon, emanating from the cingulum area or cemento-enamel junction of anterior teeth, and so named for its semblance to an eagle's talon.[1,2]

These anomalies can occur in both deciduous and permanent dentition. The etiology of talon cusps is unknown, but it is often attributed to the evagination of inner enamel epithelium during the morpho-differentiation stage of tooth development. It appears to be a balance between both environmental and genetic factors (Heaton and Pickering, 2013).

Prevalence varies considerably among ethnic groups.[3] The variability in reported prevalence rates of talon cusps may be attributed to the lack of standardised classification criteria and inconsistent definitions.[4] To address this issue, Hattab et al. (1996) proposed a standardised talon cusp scoring system.[5] This system categorises talon cusps into three distinct types based on their morphology:

Type 1: A prominent projection extending from the cingulum to more than half the distance to the incisal edge.

Type 2: A well-defined projection extending less than half the distance to the incisal edge.

Type 3: A minor expression characterised by enlarged cingula and their variations.

This classification system aims to provide a clear and consistent framework for diagnosing and reporting talon cusps, particularly those occurring on the lingual and palatal surfaces.

Talon cusps are composed of normal enamel, dentine, and may contain pulp tissue.[6] They often attach to the incisal ridge, forming a T or Y shape, with no predilection for sex, although males are reportedly

more affected[6]. Once considered rare, radiographic examination has revealed a higher incidence.[7] Their presentation is mostly unilateral and on the incisal towards the palatal with fewer bilateral or labial presentation[5]. Clinically, talon cusps are significant due to potential complications, including aesthetic concerns, speech difficulties, breastfeeding problems, attrition, occlusal interferences, temporomandibular joint pain, accidental cusp fracture, displacement of affected teeth, interference with tongue space, irritation of tongue during speech and mastication, periodontal problems due to excessive occlusal forces, development of dental caries in developmental groove of the talon cusps.[4] This article presents two case reports of talon cusp affecting permanent teeth, highlighting diverse associated complications and successful conservative treatment outcomes.

Case 1

A 10-year-old male patient presented to the clinic accompanied by his mother, who expressed concerns regarding his dental aesthetics, tongue irritation, and difficulty closing his mouth, leading to mouth breathing and teeth grinding. The patient's deciduous teeth erupted and exfoliated normally. However, upon eruption of his permanent teeth, his mother noticed him frequently grinding his teeth and complaining of tongue irritation. As the issue persisted, she observed that he struggled to close his mouth adequately, prompting her to seek dental consultation.

The patient is the eldest of four siblings (one male and three females), with no family history of similar dental anomalies. His mother reported a normal pregnancy, without any complications or medication use during the pre- and postnatal periods. There was no history of trauma or associated systemic health issues.

On examination, the patient was a healthy and energetic young boy, presented with fully erupted permanent dentition, excluding third molars. Soft tissue examination revealed minimal plaque accumulation on the palatal aspect of the maxillary central incisor and a slight diastema.

The patient exhibited a Class I molar relationship. Notably, both maxillary central incisors were slightly enlarged, with a prominent, horn-like projection palatally on the maxillary right central incisor (Figure 1). This talon cusp was large, well-defined, and hook-like, extending downward from the palatal surface of the crown, preventing adequate mouth closure.

The talon cusp exhibited a pointed, sharp tip with a slight curvature, causing tongue indentation. A moderate, non-carious dental groove was present at the junction of the talon cusp and the palatal surface of the tooth. Plaque accumulation and inflammation were observed around the marginal gingiva on the palatal surface of the maxillary right central incisor, eliciting slight bleeding on probing.

An occlusal radiograph confirmed the presence of a fully formed maxillary right central incisor, unaffected in its underlying structure (Figure 2). No additional dental anomalies or abnormalities were detected.

Treatment involved gentle reduction of the talon cusp using a high-speed turbine handpiece and diamond bur under copious water irrigation, without anesthesia, to assess sensitivity (Figure 3). Post-procedure, the patient was prescribed fluoride therapy and instructed to use fluoride toothpaste.

The patient was monitored closely through a series of follow-up appointments at weekly, bi-weekly, monthly, 3-month, and 6-month intervals, without any adverse reactions, such as color changes, pain, or periapical pathosis. Following an uneventful recovery, the patient was discharged.

A long-term follow-up examination four years later revealed that the tooth remained asymptomatic, indicating a successful treatment outcome.

Figure 1; Talon cusp on tooth 11

Figure 2; talon cusps on tooth 11

Figure 3; OPG showing talon cusp on tooth 11

Case 2

A 32-year-old female patient presented to the clinic with complaints of a projection and presence of an extra structure at the back of one of her teeth, along with intermittent pain originating from the affected tooth.

On examination, the patient was found to be a healthy young lady with a full complement of permanent dentition in a Class I molar relationship. The maxillary right lateral incisor appeared normal, with no discoloration. However, the palatal aspect revealed a horn-like projection attached to the cingulum, separated from the palatal surface by a small space that facilitated food entrapment and showed early signs of caries (Figure 4). Additionally, moderate cusp interference was observed, affecting normal occlusion.

The talon cusp was reduced through selective cuspal grinding utilising a flame-shaped diamond bur, accompanied by topical fluoride application. The patient was recalled monthly, and by the end of three visits, the cusp was virtually eliminated, although some sensitivity persisted (Figure 5). To ensure pulp protection, calcium hydroxide was applied, followed by a composite restoration.

The patient underwent an 8-month follow-up period, involving regular vitality testing and intra-oral radiographs. Throughout this time, the tooth remained asymptomatic with preserved vitality. Once stability was confirmed, the patient was discharged with instructions to return if any symptoms arose. To date, no further issues have been reported.

Figure 4: Talon cusp on tooth 12

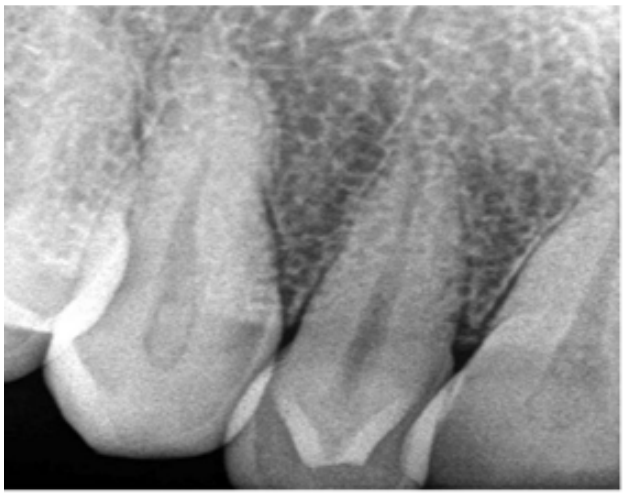

Figure 5: periapical radiograph of Talon cusp on tooth 12

Discussion

Talon Cusp, also known as dens evaginatus, is a rare dental anomaly affecting anterior teeth. A systematic literature review and meta analysis reported a range of prevalence between 0.06 % and 40.8 %.[14] Its etiology remains unknown, but it is attributed to disruptions during the morpho-differentiation stages of tooth development. Although associated with various syndromes, most reported cases occur in isolation, primarily in the permanent dentition.[15] Notably, talon cusps are more prevalent in permanent teeth than deciduous ones.[7]

The talon cusp represents an extreme variation of normal tooth morphology, existing on a continuum that includes a normal cingulum, an enlarged cingulum (trace talon), a small accessory cusp (semi-talon), and a fully formed talon cusp.[5,8]

The two reported cases of talon cusp presented unilaterally in the maxillary incisors, consistent with previous reports.[15,16] However, the gender and age of the patients differed from previous studies. Our cases involved a male child and an adult female, whereas previous reports described female children[15-17]and adults.[5,6,17,18]

Notably, the location of the talon cusp varied between the two cases, affecting the right incisor in one and the left incisor in the other. This contrasts with a previous report where all cases occurred on the right side,[15] but aligns with another study that documented involvement of both right and left incisors.[16]

In agreement with some previous studies,[15] both cases involved central incisors exclusively. However, this differs from reports describing talon cusps on lateral incisors only[17,18] or both central and lateral incisors.[16]

Small talon cusps are typically asymptomatic and require no treatment. In contrast, larger talon cusps can pose significant challenges for both patients and clinicians, from diagnosis to treatment planning.[9]

The problems associated with talon cusps in the reported cases are consistent with previously documented issues.[15-18] Patients with talon cusps may experience compromised aesthetics, breastfeeding difficulties, tongue irritation during speech or mastication, occlusal interference, and periapical and periodontal issues.[2,5]

Dentists may face additional challenges, such as diagnostic difficulties, interference with orthodontic tooth movement, and increased risk of caries due to plaque and debris accumulation in the developmental groove.

The treatment of talon cusps requires meticulous planning, contingent upon the presence or absence of pulp tissue within the cusp. However, radiographic assessment is often hindered by the superimposition of the horn over the affected crown, and histologic examination may not reliably detect pulp tissue in the anomalous cusp.[10,11]

In the reported cases, treatment was facilitated by the cusp's size and composition. The smaller cusp was successfully managed with grinding, without complications. The second tooth initially exhibited sensitivity, which resolved subsequently. This outcome aligns with previous reports where selective grinding and fluoride varnish application were effective.[15,18]

Interestingly, the adult case presented similarly to paediatric cases, with comparable treatment outcomes. This contrasts with previous reports where adult patients required more extensive treatment, including grinding and root canal therapy.[17,18]

Early diagnosis and timely treatment of talon cusps are crucial in preventing associated complications. Reports have highlighted the risks of anterior teeth subjected to shearing forces, leading to displacement of occluding teeth and potential fracture of the anomalous cusp.[9]

Prompt intervention is vital in maintaining the pulp-dentin complex's integrity, essential for preserving functional dentition. Selective grinding, fluoride varnish application, and sealant use can be enhanced by the natural formation of reparative dentine over time. Research indicates that reparative dentine formation occurs more rapidly in primary teeth than permanent teeth, and its thickness increases with time, proportional to the remaining dentine thickness.

Studies[12,13] provide valuable guidance on timed periods of selective grinding, emphasising the importance of close monitoring for color changes, vitality changes, and radiographic changes.

Early intervention and careful monitoring enable clinicians to mitigate potential complications and ensure optimal outcomes for patients with talon cusps.

Conclusion

Talon cusp is a rare developmental anomaly affecting anterior teeth, leading to varied clinical issues depending on its presentation. Prompt diagnosis and intervention are crucial in preventing complications. The two cases presented demonstrate the effectiveness of conservative treatment approaches, which were successfully employed to manage the anomaly. Therefore, conservative management is recommended for talon cusp cases, emphasising the importance of early detection and timely intervention.

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