

# Bilateral Talon's Cusp in a Paediatric Patient: When Diagnosis Meets Non-Compliance

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## ABSTRACT

**Background:** This case report presents the rare occurrence of bilateral Talon's cusps on the permanent maxillary central incisors of a 10-year-old male patient.

**Case:** The unique presentation included asymptomatic, horn-like projections on teeth 11 and 21, with radiographic evidence of incomplete apices and slight periapical radiolucency.

**Management:** A conservative management plan was proposed involving gradual reduction, pit sealing, and periodic monitoring. However, the case was complicated by patient non-compliance, resulting in incomplete treatment.

**Conclusion:** This report emphasizes not only the clinical and diagnostic challenges associated with Talon's cusp but also the critical role that patient adherence plays in the successful management of dental anomalies.

**Keywords:** Talon's cusp, dental anomaly, non-compliance, Paediatric dentistry, conservative management, maxillary incisors

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## INTRODUCTION

Talon's cusp is a rare dental anomaly characterized by a distinctive, cusp-like projection resembling an eagle's talon. It arises from the cingulum, or facial/lingual surfaces of anterior teeth and extends towards the incisal edge.<sup>1,2</sup> Its aetiology, though uncertain, is believed to involve a combination of genetic and environmental factors that disturb the normal tooth differentiation during the bell stage of tooth development.<sup>3</sup> Other contributory factors include the ectopic activity of the dental lamina, hyperactivity of the enamel organ and genetic mutations affecting odontogenesis.<sup>4</sup> Some familial cases have been linked to a hereditary component suggestive of autosomal dominant or recessive patterns.<sup>5</sup> Histologically, it is composed of normal enamel, dentin, and may contain varying amounts of pulp tissue, with or without pulp horn involvement.<sup>2,4</sup> Morphologically, the talon's cusp may create a 'T' or 'Y' shaped crown contour depending on its extent.<sup>2</sup> Hattab et al.<sup>5</sup> proposed a widely accepted classification based on the extent of cusp development and projection. The type 1<sup>5</sup>, type 2<sup>5</sup> and type 3 talons.<sup>5,6</sup>

The type 1 (True Talon) according to Hattab et al.<sup>5</sup> is a well-delineated cusp projecting prominently from the palatal or lingual surface extending at least half the distance from the cemento-enamel junction (CEJ) to the incisal edge. It contains enamel, dentin and may have pulp tissue. Most predominantly seen on maxillary laterals but can occur on other anterior teeth.

Type 2. Also known as the semi-talon, has an additional cusp, moderately prominent, extending less than half the distance from the CEJ to the incisal edge. It may blend with the palatal surface, enamel is present, dentine is usually present and may or may not contain pulpal tissue,<sup>5</sup> depending on the size of the cusp. Larger semi-talons usually contain pulp horns. It has the same location as the type 1 talon.

Type 3. Trace talon has a slightly enlarged or prominent cingulum resembling a cusp, without significant projection from the tooth surface or pulpal involvement.<sup>5,6</sup> Often, appears as a linear enlargement, groove, or pit on clinical or radiographic examination. Enamel is present, dentin may or may not be present, while pulp tissue is typically absent. Location is the same as others, and occasionally in the mandible. This variety is usually asymptomatic and requires no treatment unless it is associated with caries, plaque retention or a developmental groove susceptible to decay.

This unusual formation affects both primary and permanent,<sup>7</sup> with a prevalence ranging from 0.73% to 8%<sup>3</sup> and global estimates around 1.67%.<sup>1</sup> The maxilla is more frequently affected, and occurrences can be unilateral or bilateral.<sup>2,7</sup> While some studies suggest no significant gender predilection,<sup>1</sup> other studies indicate that males may have a higher incidence.<sup>7,9</sup> Due to its rarity, talon's cusp poses significant diagnostic and management challenges.<sup>9</sup> Most cases are asymptomatic however, the presence of a talon cusp may affect a patient's aesthetics, cause occlusal interference, increased risk of caries in the developmental grooves, speech disturbance and may complicate oral function. Children with talon's cusp are also susceptible to caries, periodontal problems, and soft tissue irritation due to plaque accumulation between the tooth and the cusp. In rare cases, pulp necrosis may occur following cusp fracture and exposure of the pulp to oral bacteria.<sup>2,7,9</sup> A radiographic evaluation is important to assess pulp involvement. Therefore, early diagnosis and tailored management are essential to prevent complications. Non-compliance with treatment poses significant challenges in the management of talon cusp. This case report highlights not only the diagnostic and clinical features of bilateral talon cusps but also explores the critical role of patient compliance in achieving favourable outcomes.

## CASE REPORT

### Patient History

A 10-year-old male presented at the dental clinic accompanied by his father, concerned about some unusual projections on his upper anterior teeth. Patient's father noticed the anomaly a year before presentation while brushing his son's teeth. The patient was asymptomatic, with no speech, mastication, or soft tissue trauma complaints. There was no relevant family or medical history.

### Clinical Examination

Extra-oral examination revealed no abnormalities. Intraorally, oral hygiene was good with healthy soft tissues. The teeth present were 16 55 54 53 12 11 21 22 63 64 65 26 36 75 74 32 31 41 42, erupting 43 84 85 46. There were no carious, filled, or mobile teeth. The molar relationship was Angle's Class 1 (Figures 1a and 1b).



Figure 1a: Photograph of the patient in right lateral occlusion



Figure 1b: Photograph of the patient in left lateral occlusion



Figure 2: Photograph of the patient's teeth in occlusion with mesiolingual rotations of 11 21 and anterior crossbite.

Teeth 11 and 21 were mesiolingually rotated with a distal flaring of teeth 12 and 22 and an anterior crossbite of 11 and 21 (Figure 2). Both 11 and 21 displayed well-defined hornlike projections on the palatal surfaces extending from the cervical area to short of the incisal edge: about 1.5mm on tooth 11 and 2mm on tooth 21. Notably, tooth 21 exhibited multiple projections and a palatal pit, while tooth 11

had a single cusp without a pit (Figure 3).



Figure 3: Photograph of the upper arch with bilateral talons



Figure 4: Photograph of the lower arch

#### Radiographic Findings

A periapical radiograph (Figure 5) of teeth 11 and 21 confirmed the presence of talon cusps, with multiple radio opacities representing multiple talons on the crown of tooth 21 and a single one on tooth 11 with some slight periapical radiolucency on tooth 21, slightly marked on tooth 22 with both teeth having incomplete root formation and open apices.



Figure 5: Radiograph of teeth 11 and 21 with apical radiolucency and incomplete root formation, and open apex.

### Diagnosis

A comprehensive clinical and radiographic evaluation led to the diagnosis of bilateral talon's cusp on the maxillary central incisors, specifically classified as Type 1. The diagnosis was based on the characteristic cusp-like projections located on the palatal surfaces of the anterior teeth, supported by radiographic features. The patient was asymptomatic, and no pulpal sensibility testing was performed. The unusual presentation of the teeth was the primary reason for seeking consultation.

### Treatment Plan

A staged, conservative management plan was proposed:

1. Gradual selective grinding of the talon cusps in multiple appointments to minimize tissue ridging, occlusal interference and improve aesthetic appeal on wide laughter. This gradual grinding will also help reduce the risk of accidental pulp exposure, thus preserving pulp vitality. This procedure will be done in combination with topical fluoride applications to reduce dentin hypersensitivity risk. The recall visits for the selective reduction would be every 8 weeks to minimize pulpal trauma or exposure, whilst monitoring for sensitivity and inflammation on the one hand and allowing for secondary dentine deposition on the other hand, all while assessing for pulpal vitality.
2. Restorative sealing of the palatal pit in tooth 21 with resin-modified glass ionomer cement (RMGIC) or composite resin to prevent caries development.
3. Periodic radiographic monitoring to assess root development, pulp status and any progression of the periapical radiolucency.

Patients' parents were counselled extensively on the nature of the anomaly, the rationale for intervention, potential complications of non-treatment (such as pulp exposure or infection), and the importance of compliance with follow-up appointments.

### Outcome

Despite initial agreement, the patient failed to return for subsequent scheduled appointments. Multiple attempts to contact the parents revealed various reasons for non-attendance, including academic commitments and time constraints. To date, no further clinical contact has been established.

### DISCUSSION

Talon cusp remains an intriguing dental anomaly due to its rare occurrence, unusual morphology, variable presentation, and potential clinical implications.<sup>5,7,11</sup> This anomaly typically presents as cusp-like projections on the palatal or lingual surface of anterior teeth, mostly on the central or lateral incisors. These projections<sup>11,12,13</sup> provide stagnation areas which make these teeth susceptible to plaque accumulation and eventual caries development. In addition, due to the morphology of the cusp, there can be an interference with occlusion during functional movements like protrusion and lateral excursions that may result in tongue ridging, traumas or wear facets to opposing teeth in moderate and severe cases.<sup>10</sup> Thus, early diagnosis through careful clinical and radiographic examination is vital.

Radiographically, these projections are seen as a V-shaped radiopaque structure superimposed over the coronal aspect of the tooth, potentially extending into the pulp chamber in cases with larger cusps.<sup>7</sup> The root and surrounding bone usually appear normal, devoid of periapical pathology.

This atypical morphodifferentiation, because of the excessive amounts of enamel organ proliferation, yields an enamel-dentin-pulp projection which is well formed but ectopic in presentation.

Management strategies for talon's cusp vary according to symptomatology, size, and pulp involvement. Therefore, whilst planning these interventions, clinicians carefully balance preservation to intervention, thereby tailoring an individualized style of management that is nuanced. Clinically, asymptomatic cases without aesthetic or functional issues may only require monitoring, whereas symptomatic or high-risk cases necessitate intervention.<sup>8</sup>

Associated complications of talon cusp include caries in developmental grooves, soft tissue irritation or ulceration in cases where the cusp contacts the lower lip or tongue and rare risks of pulp exposure where the cusp fractures or where reduction is required.<sup>4,11</sup>

Conservative gradual reduction combined with fluoride therapy reduces the risk of pulpal exposure.<sup>13</sup> Sealing developmental pits minimizes caries risk, while advanced cases may require endodontic treatment.<sup>13,14</sup>

Bilateral involvement of permanent maxillary central incisors, as in this case, is an especially uncommon presentation, thus making this case a notable developmental anomaly.<sup>2,13</sup>

This case emphasizes the major barrier to successful management: non-compliance. Non-adherence to treatment compromises preventive strategies, risking future complications that might necessitate more invasive interventions.<sup>7,15</sup> Effective communications, emphasizing potential future risks and employing motivational interviewing techniques, can improve adherence.<sup>12</sup> Additionally, involving both the child and parent actively in decision-making fosters shared responsibility and enhances engagement.

Despite thorough counselling, dentists must recognize that the ultimate responsibility for compliance rests with the patient or guardians. Documentation of communication, recommendations, and patient refusals is critical for medico-legal protection.<sup>16,17</sup>

#### CONCLUSION

Talon cusp is a rare dental anomaly with potential aesthetic, functional and pathological implications. On one end of the spectrum, early recognition, risk assessment, and proactive management are essential. However, patient and parental non-compliance can significantly hinder optimal outcomes. Dentists must focus on education, clear communication, and continuous engagement, while recognizing the limits of clinical control over patient behaviour.

At the other end, there is still not much awareness among the populace and, to some extent, dentists. Thus, presentation of any talon cusp is a noteworthy find during routine general examinations.

#### Source of Support

Nil

#### Conflict of interest

None declared

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