

## Endodontic Management of Dens Evaginatus (Talon Cusp) On Maxillary Lateral Incisor- A Case Report

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**Abstract:** Dens evaginatus is a developmental malformation characterized by the presence of an extra cusp that takes the form of a tubercle arising from the occlusal or lingual surface of tooth. It frequently affects maxillary permanent incisors. Its presence affects esthetics, occlusal accommodation and are more prone for caries. Diagnosis and clinical management of this anomaly is challenging for the dentist. This case report presents a tooth with talon cusp diagnosed as chronic irreversible pulpitis with apical periodontitis.

**Keywords:** Dens evaginatus, Endodontic, Lateral incisor, Maxillary, Talon cusp

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### I. Introduction

Talon cusp (DE) is an uncommon odontogenic anomaly comprising of an accessory cusp like structure, more commonly seen on the palatal surfaces of the maxillary incisors. This unusual dental anomaly was first described by Mitchell in 1892. <sup>1</sup> It was thereafter named talon cusp by Mellor and Ripa due to its resemblance to an eagle's talon. <sup>2</sup>

It clinically presents as, supernumerary accessory talon-shaped cusp projecting from the lingual or facial surface of the crown of a tooth and extending for at least half the distance from the cemento-enamel junction to the incisal edge. <sup>3</sup>

Maxillary incisors are the teeth commonly affected in permanent dentition and among them maxillary lateral incisors (55%) followed by maxillary central incisor (33%). Predominantly 65% of the talon cusps occurs in males and palatal surface is the usual location for this developmental anomaly. <sup>4,5</sup> Prevalence of talon cusp varies considerably among ethnic groups ranging from 0.06% to 7.7%. <sup>6</sup> There are several reports presenting concurrence of developmental anomalies with talon cusp in the same tooth, however only 4 cases of talon cusp teeth with periapical pathosis have been reported. <sup>7,8,9</sup> This anomaly has been reported to be more prevalent in patients with syndromes like Rubinstein-Taybi, Mohr syndrome (oral-facial-digital syndrome type II), Sturge-Weber syndrome (encephalotrigeminal angiomatosis), or incontinentia pigmenti achromians. <sup>10</sup>

This case report presents successful endodontic management of maxillary right lateral incisor with talon cusp.

### II. Case Report

A 20-year-old female patient reported to the Department of Conservative Dentistry and Endodontics, KVG Dental College and hospital, Sullia, Karnataka with a chief complaint of pain in the upper right front tooth region since one month. The medical and dental history was noncontributory.

Clinical examination showed the presence of an accessory cusp on the palatal aspect of the permanent maxillary right lateral incisor (tooth 12), extending more than half the distance from the cemento-enamel junction (CEJ) to the incisal edge. This 'V' shaped conical prominent cusp measured around 4mm wide (mesiodistally), 6mm (incisocervically) and 3mm thick (labiolingually). (Fig. 1). Hard tissue examination of the tooth revealed dental caries distal to the talon cusp in palatal surface of the tooth.

Tooth was tender on vertical percussion and showed delayed response on electric pulp vitality test using an Analytic Pulp Tester (Analytic Technology Corp., Richmond, VA, USA.). Intraoral periapical radiograph revealed a triangular, radiopaque shadow superimposed over the middle third of crown of the tooth with the presence of enamel, dentin and pulp horn. (Fig. 2)

Based on the clinical and radiographic findings, diagnosis of type 1 talon cusp with symptomatic apical periodontitis was made in relation to the maxillary right lateral incisor. Endodontic treatment was initiated under local anesthesia (lidocaine 2% with epinephrine 1:80 000). Access cavity preparation on the palatal surface of the tooth was achieved after removing the talon cusp. Working length was determined with an apex locator (Root ZX; J. Morita, Osaka, Japan). Biomechanical preparation was performed using ProTaper gold (Dentsply Maillefer) rotary instruments under copious irrigation with 2.5% sodium hypochlorite and 17% ethylenediaminetetraacetic acid. Calcium hydroxide dressing was given as intra canal medicament. Patient was recalled, after cleaning and shaping, root canal canal was obturated with cold lateral condensation using gutta-percha and AH plus sealer (Dentsply, USA).(Fig.3)

### III. Discussion

The complex process of tooth development involves various stages, making it vulnerable to various developmental anomalies. One of such anomaly is talon cusp and its etiology is not very clear. Several theories have been suggested for its occurrence. The most accepted hypothesis is that an unfolding of enamel organ or hyperproductivity of the dental lamina during the morphodifferentiation stage of tooth development .<sup>11</sup>

According to Chawla et al, to consider the projection as a talon cusp, it must extend at least one millimetre or more beyond CEJ.<sup>12</sup> Hattab et al, classified talon cusps as Type I (talon), a morphologically well-delineated additional cusp that extends at least 50% of the distance from the CEJ to the incisal edge of the tooth; type II, (semitalon), an additional cusp ( $\geq 1$  mm) that extends to less than half the distance from the CEJ to the incisal edge; and type III (trace talon), an enlarged or prominent cingulum, which occupies less than 25% of the distance from the CEJ to the incisal edge.<sup>13</sup>

The talon cusp presented in this case report extended from the cemento-enamel junction to 0.5mm short of the incisal edge, which is a type 1 or true talon cusp. Two dimensional radiographic techniques are usually adequate for the correct diagnosis of dens evaginatus except in the cases of concurrence with different developmental anomalies in the same tooth.<sup>14</sup> In the present case, intraoral periapical radiographs at different horizontal angulations were taken. It aided in the proper diagnosis and any other radiographic techniques were not deemed necessary.

Talon cusp raises aesthetic, functional, and pathological challenges. Depending on the shape, size and location, it may lead to numerous problems in patient such as; tooth mobility (periodontal complications), cusp fracture, speech difficulties, occlusal trauma and trauma to adjacent soft tissue.<sup>15</sup> Moreover, teeth with talon cusp may undergo pulpal necrosis in the absence of early diagnosis and proper management.

Various treatment modalities have been followed for the management of talon cusps according to the type of presentation and complications of talon cusp.<sup>16</sup> Small talon cusps which are asymptomatic require no therapy; while treatment of large talon cusps depends on the absence/presence of pulpal extensions. Treatment options for managing the occlusal interference caused by large talon cusp include reducing the bulk of the cusp gradually and periodically and the application of topical fluoride, or total reduction of the cusp and calcium hydroxide pulpotomy.<sup>17</sup> Orthodontic intervention may become necessary when there is tooth displacement or malalignment.<sup>18</sup>

The present case reported with dental caries involving pulp distal to the accessory cusp. Intraoral periapical radiograph revealed widening of periodontal ligament space. The deep developmental grooves and fissures seen along side the talons cusp might have predisposed the teeth to early dental caries. Literature provides sufficient evidence regarding the predisposition of teeth with talons cusp to dental caries.<sup>19,20</sup> Dental caries with pulpal pathology in this case necessitated endodontic treatment.

### IV. Figures And Tables



**Fig.1:** Preoperative photograph



**Fig. 2:** Pre operative radiograph



**Fig. 3:** Obturation radiograph

## V. Conclusion

Talon cusp requires clinical importance as it increases the chance of early dental caries and pulp pathology. It provides a substantial challenge during diagnosis and treatment planning to clinician. Early diagnosis of this anomaly and prophylactic measures are essential to preserve the vitality of the tooth. Nonsurgical endodontic intervention is the next line of treatment in case of pulpal involvement.

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