Supernumerary tooth with dens evaginatus in a 14 year old male child: A case report

Wadhawan R¹, Rajan P², Reddy TY³

1. Senior Lecturer, Oral Medicine, Diagnosis & Radiology Institute of Dental Education & Advance Studies, Gwalior, India
2. Principal & Professor & Head of department, Periodontics, Institute of Dental Education & Advance Studies, Gwalior, India
3. Professor & Head of department, Oral Medicine, Diagnosis & Radiology Institute of Dental Education & Advance Studies, Gwalior, India

Corresponding author: Richa Wadhawan, Senior Lecturer, Institute of Dental Education & Advance Studies, Gwalior, Madhya Pradesh, India

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ABSTRACT
Dens evaginatus is a developmental anomaly characterized by the occurrence of an extra cusp shaped as a tubercle projecting from the palatal or buccal surfaces. In the anterior dentition, dens evaginatus is more commonly found in the maxilla and on the palatal surface of the tooth. This article provides a literature review and report a case of dens evaginatus in a supernumerary teeth maxillary right lateral incisor & canine. The patient is a 14-year old male child with a chief complaint of gingival bleeding.
CASE REPORT

ARTICLE

Key Words: Dens evaginatus, evaginated odontoma, supernumerary teeth

1. INTRODUCTION

Dens evaginatus is an anomalous tooth development arising during morph differentiation. It is caused by abnormal proliferation of the inner enamel epithelium into the stellate reticulum of the enamel organ with a core of dentin surrounding a narrow extension of the pulp tissue projecting into the tubercle. It is a developmental anomaly, which can be defined as a tubercle, projecting from the occlusal or lingual surfaces of the affected tooth. It is comprised of enamel and dentin that usually enclosing pulp tissue and referred to as “Talon’s cusp” in the anterior teeth and “Leong’s premolar” in the premolar teeth. It is also referred to as tuberculated cusp, accessory tubercle, occlusal tuberculated premolar, Leong’s premolar, evaginatus odontoma and occlusal pearl (Echeverri EA et al., 1994). The occurrence of dens evaginatus shows great racial differences, with a higher prevalence among people of Mongoloid origin. It appears primarily in the Mongoloid racial group: the Paleo-Asiatics (Indians of North, Central and South America and Eskimos), the Neo-Asiatics, and the Indonesian-Malays (Filipinos). Dens evaginatus has been reported in Chinese, Thai, Eskimos, and North American Indians and occasionally in Caucasians. This anomaly has been found in 3% to 4.8% of Chinese and Eskimo populations, but is rare in white populations. This may be seen more frequently in Asians, but almost exclusively in Down Syndrome (Ngeow WC et al., 1994). This anomaly, an enamel-covered tubercle on the occlusal surface between the buccal and lingual cusps of posterior teeth, can occur unilaterally or bilaterally. It occurs primarily in premolars but also has been reported although rarely on molars, canines and incisors. The occurrence is five times more frequent in the mandible than in the maxilla. The clinical importance of this condition is that this tubercle easily fractures or is worn away, exposing the fine pulpal extension, which may lead to infection. The tubercle may fracture or be abraded as soon as the tooth comes into occlusion (Uyeno DS et al., 1996).

Figure 1 Labial view of patient depicting dens evaginatus in between maxillary right lateral incisor and canine

The pulp of the tooth may extend into the dens evaginatus. There is a risk of the dens evaginatus chipping off in normal function. Hence this condition requires monitoring as the tooth can lose its blood and nerve supply as a result and may need root canal treatment. Etiology is not clear, but several researchers have suggested a familial or hereditary pattern. Due to tubercular fractures in dens evaginatus may have some endodontic substances such as complications about pulpitis, pulp necrosis, and apical periodontitis (Levitan ME et al., 2006). Occlusal forces and attrition cause to develop these fractures, and they lead to direct pulp exposure in a non-carious tooth. Most cases of dens invaginatus are discovered with radiographic evaluation, because of the enamel lining that is more radiopaque than the surrounding tooth structure. It is easier to detect dens evaginatus as a tubercle of enamel on the occlusal surface clinically. The radiographic image shows the extension of dentin covered with opaque enamel. But, the pulp horn cannot be seen because of the superimposition of the enamel. Cone beam computed tomography (CBCT) potentially provides the clinician with the ability to observe an area in three different planes with a practical tool for three-dimensional reconstruction imaging for use in endodontic applications and morphologic analyses (Yip W et al., 1974). The combination of sagittal, coronal, and axial CBCT images helps to eliminate the superimposition of anatomic structures. Tooth morphology can be visualized in three dimensions; from this point, CBCT has been suggested to assist in identifying all of the dental anomalies. A supernumerary tooth
indicates an excess in tooth number. Its frequency is between 0.3% and 3.8% of the population studied. Most of the supernumerary teeth are located in the premaxillary region. Dens evaginatus usually occurs alone, but rarely can it be seen in association with other dental anomalies such as dens invaginatus, supernumerary teeth and peg-shaped incisors (Geist J et.al, 1989).

This article describes a case of simultaneous occurrence of dens evaginatus on a supernumerary tooth between maxillary right lateral incisor & canine.

2. CASE REPORT
A 14 year old male child patient reported to outpatient department of Institute of Dental Education & Advance Studies, Gwalior with chief complaint of yellowish discoloration of teeth & bleeding gums. On intra oral examination a supernumerary tooth was observed between right maxillary lateral incisor and canine which had innocuous looking tubercle on occlusal surface identified as Dens evaginatus (Fig 1, 2 & 3). Tooth was asymptomatic. Patient consent was obtained to radiographically examine the supernumerary tooth 35 having dens evaginatus. Panoramic radiograph (Fig 4) was obtained revealing a small radio-opaque projection of occlusal surface.

Figure 2 Occlusal view of patient depicting dens evaginatus in between maxillary right lateral incisor and canine

Figure 3 Palatal view showing the presence of dens evaginatus in between maxillary right lateral incisor and canine
3. DISCUSSION

Dens evaginatus also referred to as a talon's cusp, is an uncommon dental anomaly, having been well documented since 1925 characterized by formation of a well delineated additional cusp that extends from the cemento enamel junction to the incisal edge. Dens invaginatus is a developmental anomaly caused by invagination of the surface of the tooth crown before calcification has occurred (Gaynor WN et al., 2002). Dens evaginatus and dens invaginatus are usually present in isolation and many cases have been reported. But, their concomitance is highly rare. It occurs primarily in people of Asian descent and is exhibited by protrusion of a tubercle from occlusal surfaces of posterior teeth and lingual surfaces of anterior teeth. Dens evaginatus is a congenital malformation of the tooth structure. The cusp-like anomaly itself does no harm to the patient. However, because of its occurrence on the occlusal surface, this cusp can be easily fractured or worn away through abrasion, leading to pulpitis or pulpal necrosis (Mellor J et al., 1970).

Recognizing this anomaly usually is not a problem when the affected tooth has just erupted while not in occlusion. Parents or guardians should be informed about potential complications of this anomaly. It would be appropriate to observe the eruption of the affected teeth closely, and once it is determined that the anomalous cusp is going to be in the path of occlusion, remove the structure (Garvey MT, 1999). If there is pulp exposure, a direct pulp capping should be performed and appropriate restoration placed. Tubercles have an enamel layer covering a dentin core containing a thin extension of pulp. These cusp-like protrusions are susceptible to pulp exposure from wear or fracture because of malocclusion, leading to pulpal complications soon after eruption.

Supernumerary teeth are teeth in excess of the number found in the normal series. Supernumerary teeth are a developmental abnormality referred to teeth formed in excess number of that found in the normal dental formula. They are considered to be one of the most significant dental anomalies affecting the primary and mixed dentition because of the clinical problems they can create (Hattab FN et al., 1994). Ninety to 98% of all supernumeraries occur in the maxilla with strong predilection for the premaxillary region ranged between 65 and 90%. Supernumerary teeth may be single or multiple, unilateral or bilateral, malformed or normal in size and shape, erupted or impacted, and occurs in the maxilla, the mandible, or both. Single supernumerary occur in 64-86%, double supernumeraries in 12-23%, and multiple supernumeraries in 1-5% of the cases. The prevalence of supernumerary teeth ranges from 0.03 to 1.9% in the primary dentition and 0.15 to 3.8% in permanent dentition with the prevalence in the primary dentition about 5 times lower. Beside racial variations, the age, size and type of the sample studied and the methodology used for detection, may account for this wide range. Males are affected approximately twice as frequently as female in the general Caucasian population (Backman B et al., 2001). A greater male: female ratio was found among Mongolian groups.

The prevalence of supernumerary teeth in the permanent dentition of the white population is about 2% to 3%, and about 90% of all supernumerary teeth occur in the premaxilla. Both supernumerary premolars and dens evaginatus occur most frequently in the
Apart from grinding of the accessory cusp, the tubercle may be ion, mesiodens, supernumerary premolars and three rooted mandibular teeth. The etiology of supernumerary tooth is not clearly known. Both genetic and environmental factors may combine to determine its phenotypic appearance. The most accepted theory suggests that supernumerary teeth result from hyperactivity of the dental lamina. Supernumerary teeth arise during the morphodifferentiation stage as a result of an evagination of the inner enamel epithelium and dental papilla into the stellate reticulum during the early stages of tooth development (Grahn H et al, 1967).

Dens evaginatus is also a clinically significant anomaly. Because the anomaly contains enamel, dentin and a varying amount of pulp tissue, fracture of the tubercle can cause pulp exposure and periapical pathology. Studies revealed that 14-40% of dens evaginatus show pulpal and periapical involvement (Rubenstein LK et al, 1991). Treatment options for dens evaginatus show wide variations, ranging from no treatment to pulp therapy. Treatment options have changed as technology and materials have improved including a truly prophylactic approach without pulpal invasiveness. Apart from grinding of the accessory cusp, the tubercle may be left as it is when there is no occlusal interference (Rajab LD et al, 2002). Priya et al. reported a case of bilateral occurrence of dens evaginatus on the maxillary second premolars in which the tubercles were left untreated. Mild occlusal discrepancies might be corrected by reducing the opposing occluding teeth (Goto T et al, 1979). Rao et al. described a case where progressive grinding of the accessory cusps and reduction of the opposing occluding teeth were performed (Curzon ME et al, 1970). However, reduction of the opposing teeth might result in increased sensitivity of the grinded teeth. If pulp exposure occurs due to fracture of the tubercle before apical maturation, apexitification is performed before conventional root canal treatment. Dens evaginatus has been reported to be associated with dental fusion, mesiodens, supernumerary premolars and three rooted mandibular molars (Tsai SJ et al, 1998). (Cho et al, 2006) investigated concomitant dental anomalies in a group of Chinese children with dens evaginatus, and observed it in 17.2% of the cases. The prevalence of dental anomalies in their study did not differ significantly to that found in the general population, except for supernumerary premolars. Clinical significance of dens evaginatus is that its fracture may lead to pulpal disease. Moreover, location of the accessory tubercle may result in occlusal interference. Periodic grinding of the anomalous tubercle has been advocated in the literature (Oehlers FA et al, 1956).

### 4. CONCLUSION

This is such an important case report at local scale because Dens evaginatus has been scarcely reported, and also for the subsequent potential pulpar problems to the patients derived from this anomaly. Due to low incidence of this dental anomaly among population, it is important that dental professionals must well known about this anatomical variation, as well as must be prepared to perform a carefully treatment planning previously to intervene a dens evaginatus, to avoid unexpected problems during dental treatments procedures generated by ignorance of morphology of this anatomical variation.

### REFERENCES


