

CASE REPORT

Multiple Dens Evaginatus of Premolars and Molars in Chinese Dentition: A Case Report and Literature Review

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Abstract

Dens evaginatus (DE) is a dental anomaly that occurs as an accessory tubercle on the occlusal or lingual surface of a tooth. The authors provide a literature review and report a rare case in which DE occurs on multiple mandibular premolars and maxillary molars.

The patient is a 26-year-old Chinese woman, with a chief complaint of gingival bleeding. DE affecting teeth 17, 27, 35,

and 45 was found during clinical examination. For treatment of the patient, we reduced the opposing occluding teeth, while undertaking progressive grinding of the tubercles for six months. We followed-up for a year.

This suggests the importance of examining for multiple DE during clinical practice.

Keywords Dens evaginatus, evaginated odontome, molar, premolar

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Literature Review

Dens evaginatus (DE), also known as evaginated odontome, is a developmental anomaly that is the result of an abnormal proliferation of the inner enamel epithelium into the stellate reticulum of the enamel organ. DE is characterized by a tubercle arising from the lingual or occlusal surfaces, consisting of an outer layer of enamel, a core layer of dentin, and sometimes a slender extension of pulp tissue into the dentin. This type of anomaly occurs almost exclusively among people of Mongoloid races, such as the Chinese, Japanese, and Eskimos (Ngeow and Chai, 1998). DE occurs occasionally in Malays, but may be present in rare cases in Caucasians and African-Americans (Hill and Bellis, 1984; Ngeow and Chai, 1998). The prevalence of DE ranges from less than 1% to 4% according to race (Hill and Bellis, 1984); DE occurs in approximately 2% of Asian populations (Jerome and

Hanlon, 2007). Among Chinese, the prevalence is from 1.29%–3.6% (Kocsis *et al.*, 2002).

DE should be differentiated from other unusual dental morphology such as talon cusp or Bolk's cusp. The talon cusp occurs as an accessory on the lingual surface of either permanent or primary incisors, maxillary and mandibular, which projects from the cingulum area of the tooth and resembles an eagle's talon. It is often bilateral and is composed of enamel, dentin, or pulpal tissue. It may be subject to pulpal exposure if the cusp is removed or fractured by occlusal movement. Some researchers point out that the talon cusp should be differentiated from DE according to the location, incidence, and clinical appearance of the abnormality (Vasudev and Goel, 2005). Other scholars suggest the talon cusp and DE are the same type of anomaly (Levitan and Himel, 2006).

Bolk's cusp or tubercle, another dental anomaly that commonly affects the premolars and molars,

is characterized by a supernumerary tubercle or cusp on the buccal side of the tooth.

DE usually affects the mandibular second premolars as an accessory cusp or a protuberance between the buccal and lingual cusps. It can also occur on molars, canines, and incisors (Hill and Bellis, 1984). When found on molars, it is in the central groove on the occlusal surface or on the lingual ridge of the buccal cusp. Usually, DE appears only on one or two teeth in one dentition, being symmetric on both sides. Projecting pulp horns are commonly laid beneath the tubercles, which makes the tubercle the weakest spot of the tooth. Therefore, DE is usually subject to exposure of pulp at an early stage, and this may lead to inflammation, necrosis of the pulp tissue, periapical inflammation, and even the osteomyelitis of the affected alveolar bone.

For the treatment of DE with pulp exposure, the affected teeth should receive endodontic treatments such as partial vital pulpotomy or apexification when the root formation is immature. If these treatments cannot be achieved, a root-end resection, or root-end amalgam restoration would be required. Pulpectomy can be conducted when the root formation is mature. An extraction may be required if all such treatments fail (Stecker and DiAngelis, 2002). A recent case report by Reynolds *et al.* suggests the revascularization of dental pulp is possible after stringent sterilization and sealing of the pulp chamber (Reynolds *et al.*, 2009).

DE without pulp exposure should be treated by reducing the occluding surface, and applying resin coverage to the tubercle. A long-term revisit schedule is advised for a follow-up inspection.

Our report describes a case of DE that occurred in four teeth: bilateral lower second premolars and upper second molars. Seldom do cases of DE occur in upper molars, and DE variously scattered in both premolars and molars is rare.

Case Report

A 26-year-old woman attended our hospital with the chief complaint of gingival bleeding while brushing teeth in the morning. The patient did not mention other complaints or symptoms.

A medical examination of the patient showed

poor oral hygiene. DE was found in both the upper second molars and lower second premolars. DE of the second molars was in the central fossa, whereas DE of the premolars obliterated the central groove. We found no wearing or fracture of the tubercles and no exposure of dentin or pulp. Percussion showed no sensitivity or pain, and neither did warm or cold testing. The electrical pulp-vitality test showed no stimulated pulp state or necrosis comparing with neighboring teeth (numbers 16, 17, 26, 27, 34, 35, 36, 44, 45, and 46). Examination of previously taken X-rays of the four teeth revealed that the root apex had developed a mature and high extension of the pulp tissue to the tubercles. No endodontic or periapical lesions were found. The gingivae were bluish and swollen. We detected pigment, supragingival and subgingival calculus. Bleeding on probing was strongly positive. We found no obvious occlusion interference. Examination of the temporomandibular joint showed no positive result. Photographs and X-ray images of DE affected teeth are shown in Figures 1–3.

The patient is an immigrant worker from a neighboring rural area, where the incidence of DE is not significantly different from that for the



Figure 1 Bilateral maxillary second molars with DE



Figure 2 The lower second premolars with DE

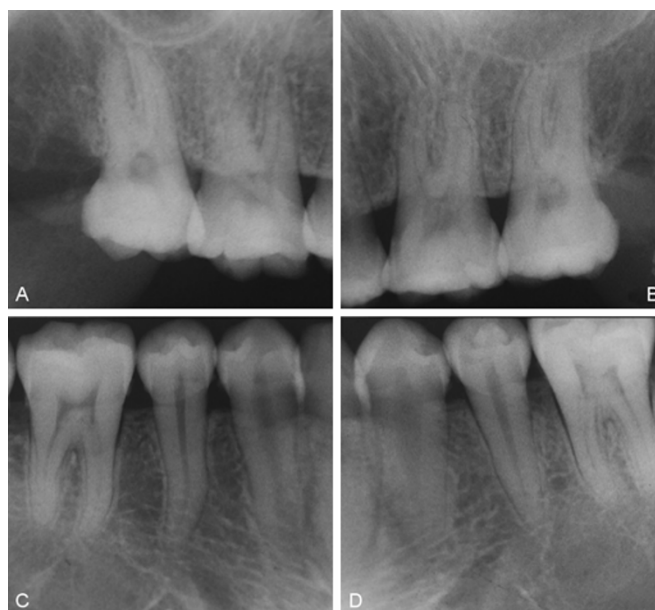


Figure 3 Radiographic views of corresponding teeth before treatment

A: 17, B: 27, C: 35, D: 45.

general population. We found no obvious systemic or congenital disease. The patient denied the occurrence of DE in family members.

A thorough periodontal treatment was provided by scaling and root planing. To treat the DE, we reduced the opposing occluding teeth using a high speed handpiece with a flame-shape bur. Resin coverage was also applied to the corresponding tubercles after preparation of shallow cavities. Regarding the DE in this case to be significant, we carried out progressive grinding, three times over six months (at the first visit, after three months, and at six months after the first visit) using a high-speed handpiece to prevent the teeth from potential pulpitis and to stimulate reactive dentin formation.

We checked the patient during her subsequent visits for the next year and found no complications. We have also scheduled telephone follow-ups every year.

Discussion

DE is a developmental anomaly that usually affects premolars. In most cases, its tendency is toward mandibular premolars, and DE in maxillary premolars is comparatively infrequent. Multiple DE variously scattered in molars is even rarer. In

recent decades, similar cases involving bilateral premolars and molars as we have described have seldom been reported. Stecker and DiAngelis reported in 2002 that a nine-year-old Hispanic girl had five erupted premolars (numbers 4, 5, 12, 21, and 28) with evidence of DE (Levitan and Himel, 2006). In 2001 Sakiyama reported a case of DE that occurred in a molar, in particular, a lower second molar (Sakiyama, 2001). In 1998, Ngeow and Chai reported DE in the wisdom tooth and subsequently pulpitis of an 18-year-old Malaysian man (Ngeow and Chai, 1998). An investigation conducted in 1975 by Reichart and Tantiniran presented one case of DE in 133 premolars and in one molar of 51 patients (Reichart and Tantiniran, 1975). It should be noted that DE-affected molars are different from supplemental cusps, such as the cusp of Carabelli (Neville *et al.*, 2002), which is a rare occurrence in Asians, but has been reported in 17.4% to 90% of Caucasians, and occurs most often on the palatal aspect of the mesiolingual cusp of maxillary first molars (Ash, 2003).

Normally, DE is worn down and this leads to relatively early pulp exposure. This is almost always followed by dental pulp inflammation and immature root apex development. Alternatively, the tubercle is progressively worn through with no symptoms. In the case we describe here, the patient had no symptoms. Though the apex developed

maturely, the tubercles were hardly abraded, and so potential interruption of the occlusion could occur. Therefore, we proceeded to grind down the protrusion gradually and used desensitization therapies in order to prevent stimulating the dental pulp during the treatment. Observation after one year showed a satisfactory outcome.

Conclusion

DE is a dental anomaly that occurs mainly in Asian people. It usually affects premolars. This report illustrates a rare case including premolars and molars, which should remind clinical practitioners to be alert for the possibility of multiple DE. The successful treatment of this patient indicates that progressive grinding, while reducing the opposing occluded surface, prevent further wearing of the tubercles and improve occlusion. Follow-up revisits indicated that this treatment can produce acceptable results.

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