

Endodontic treatment of bilateral dens evaginatus premolars with large periapical lesions

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Abstract: Dens evaginatus is a developmental anomaly characterized by the presence of an accessory cusp composed of enamel and dentine, usually containing pulp tissue. This condition is clinically important because of fracture or wear of the tubercle, which can frequently lead to the major complication of pulp necrosis and periapical infection. Treatment varies according to pulp condition, tubercle integrity, and stage of root development. Here we report a case of bilateral dens evaginatus with large periapical lesions. Non-surgical root canal treatment using calcium hydroxide medication was performed for both mandibular second premolars. At the 3-year postoperative recall examination, the teeth were asymptomatic and radiographically showed healing of the periapical lesions. (J Oral Sci 51, 475-479, 2009)

Keywords: calcium hydroxide; dens evaginatus; periapical lesion; premolar; root canal treatment.

Introduction

Dens evaginatus is a developmental anomaly characterized as an enamel elevation similar to a cusp, generally located in the main groove of molars and premolars (1,2).

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It may also be observed on the lingual surface of incisors (also called talon cusp) (3-5). This anomaly is often bilateral, and mandibular premolars are the teeth most frequently affected (6,7). The etiology of this malformation is uncertain, but genetic factors may be involved. A racial predominance is observed mainly in the mongoloid ethnic group. The prevalence of dens evaginatus among the mongoloid race has been reported to vary from 1.01% to 4.3% (7-9). Evaginated teeth have an enamel layer covering a dentine core containing a thin extension of pulp (10). These cusp-like protrusions are susceptible to pulp exposure from wear or fracture because of malocclusion, leading to pulpal complications soon after eruption (11,12). Early diagnosis and treatment of dens evaginatus is important for preventing pulp infection via the evagination. Prophylactic restoration of dens evaginatus is the preferred treatment choice. Several methods have been advocated, including selective grinding, prophylactic pulp capping, and filling (11,13,14). If pulp inflammation occurs, endodontic treatment should be considered. The complexity of treatment is increased when the tooth has an immature apex. Two approaches (apexogenesis or apexification) are indicated when pulps of young permanent teeth with incompletely formed roots are damaged (15).

This article reports a case of bilateral dens evaginatus involving the mandibular second premolars in which the affected pulps became necrotic. Non-surgical root canal treatment of the evaginated tooth resulted in resolution of a substantial periapical lesion.

Case Report

A 17-year-old girl with a noncontributory medical

history was referred for endodontic treatment of second left and right mandibular premolars (teeth 35 and 45). She had noticed a lingual swelling in the left mandibular area one month previously with slight discomfort. At the time of the first visit, the patient was asymptomatic. Clinical examination revealed worn accessory occlusal cusps and pinpoint defects of both caries-free second premolars (Fig. 1). Both of these teeth were slightly sensitive to percussion and palpation and failed to respond to electric pulp sensitivity testing; the adjacent teeth responded within normal limits. Periodontal probing around teeth 35 and 45 revealed no deep pocketing. The maxillary premolars did not exhibit any coronal tubercle. Radiographic examination revealed bilateral dens evaginatus, and radiolucent lesions around the apices of the affected teeth (Figs. 2 and 3). The roots of both teeth were fully formed. A clinical diagnosis of bilateral mandibular dens evaginatus with associated periapical

pathologic involvement secondary to pulp necrosis was made. Following isolation of the teeth with a rubber dam, the access cavities were completed. A #30 K-file was the first instrument felt to bind, and working lengths were established (Fig. 4). Suppurative fluid flowed from the canal of tooth 35. When drainage had ceased at the second visit, both canals were debrided thoroughly and prepared by the step-back technique to major apical size #40. The root canals were irrigated copiously with 2.6% sodium hypochlorite solution. After drying with sterile paper points, calcium hydroxide (Vitapex, Neo Dental Chemical Products, Tokyo, Japan) was applied to both root canals (Fig. 5). The calcium hydroxide medication was changed every 2 months for 4 months, at which time the teeth were asymptomatic and the canals were dried. Four months later, the patient returned without symptoms, and radiographs revealed significant healing. At this visit it was decided to obturate the canals by lateral condensation of



Fig. 1 Preoperative view of the evaginated left and right second mandibular premolars.



Fig. 2 Preoperative panoramic radiograph showing bilateral dens evaginatus with large periapical lesions.



Fig. 3 Preoperative radiographs of the left (a) and right (b) premolars showing dens evaginatus with periapical radiolucency.

gutta-percha and zinc oxide-eugenol sealer (Canals, Showa Yakuhin, Tokyo, Japan). The access openings were then sealed with a temporary filling and postoperative

radiographs were taken (Fig. 6). The patient returned after 3 months without any symptoms, and the temporary filling was replaced by a composite filling using the acid-etch

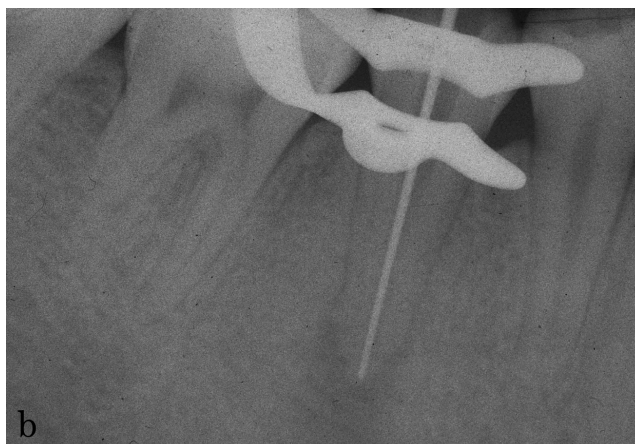


Fig. 4 Length determination radiographs. A K-file placed in the left (a) and right (b) premolars.



Fig. 5 Immediately after the initial placement of calcium hydroxide. Note extruded paste in the left (a) and right (b) premolars.



Fig. 6 Radiographs immediately after gutta-percha obturation of the left (a) and right (b) premolars.



Fig. 7 Three-year postoperative radiographs of the left (a) and right (b) premolars, demonstrating complete bone repair.



Fig. 8 Postoperative clinical view showing composite filling on both of the second premolars.

technique. Follow-up radiographs at 3 years revealed absence of any periapical lesion, and the patient has remained asymptomatic (Figs. 7 and 8).

Discussion

In most cases, dens evaginatus is detected by routine oral examination. Clinically, unusual crown morphology such as a protrusion cusp may provide an important hint, but sometimes the affected teeth may exhibit no external evidence of evaginatus malformation or caries. As mandibular premolars are the teeth most susceptible to coronal evagination, these teeth should be investigated thoroughly, both clinically and radiographically, at least in all cases where a tubercle is evident at the occlusal surface. If one tooth is affected in a patient, the contralateral tooth should also be investigated. As pulpal involvement of teeth with evaginations may occur a short time after tooth eruption, early diagnosis is necessary to initiate preventive treatment. Correct diagnosis may depend on the diagnostic

quality of the film, but is more influenced by the practitioner's knowledge and experience. In the present case, both second mandibular premolars had a tubercle-fractured dens evaginatus and associated periapical lesions.

When pulp necrosis occurs before completion of root formation, apexification procedures with calcium hydroxide may be effective for conserving the tooth. Apexification is a method designed to induce a calcified barrier in a root with an open apex or the continued apical development of an incomplete root in teeth with necrotic pulp (16). Clinical exploration during root canal treatment of the evaginated teeth suggested that a #30 K-file bound in the apical region. The roots of both teeth were fully formed. After completion of root formation, pulp necrosis may occur. Therefore, both root canals were debrided thoroughly and prepared by the step-back technique to apical file size #40. Root canal preparation was accomplished using a combination of mechanical instrumentation and chemical irrigation. Intracanal medication using calcium hydroxide has been described as an efficient means of disinfection (17) and has been recommended for cleaning of the complex morphology of the root canal system. Also, calcium hydroxide has been reported to successfully dissolve any pulp tissue remaining on the pulp canal wall (18). Clinically, it has been employed for the promotion of periapical healing in non-vital teeth with associated periapical lesions (19,20). In addition, calcium hydroxide is used for drying wet canals in order to control exudation (21). In the case presented here, introduction of Vitapex created a more favorable environment, leading to better and more rapid healing of the periapical lesion. This paste is composed of calcium hydroxide, iodoform, silicone oil and other substances. Along with the expanded clinical use of calcium hydroxide, iodoform has been added to improve

properties such as antibacterial activity, anti-inflammatory activity and radiopacity. However, controversy exists as to whether or how often the calcium hydroxide medication should be changed. A number of authors propose that the calcium hydroxide should be replaced only when symptoms develop or the material appears to have washed out of the canal when viewed radiographically (22,23). A 2-month interval was chosen in this case because the patient did not have enough time to attend often. The follow-up radiograph at 4 months revealed resolution of the periapical radiolucency. Endodontic treatment with calcium hydroxide medication is a successful method for promoting periapical healing in an evaginated tooth with a periapical lesion.

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