Two Root Canals in a Maxillary Central Incisor with Enamel Hypoplasia

Saad Al-Nazhan, BDS, MSD

Presented is a case of enamel hypoplasia of a maxillary central incisor which was referred for endodontic therapy. Radiographical examination revealed a tooth having one root and two canals. Endodontic therapy was performed under aseptic conditions.

The morphology of the teeth is discussed widely in the literature. The presence of an additional canal in the maxillary central incisor is extremely rare, as is indicated in several published anatomical studies (1-5). The presence of an additional canal in the maxillary central incisor has been mentioned in the literature in case reports (6-10). This anatomical variation is thought to be limited to teeth with developmental anomalies such as gernination and fusion. The presence of such an anomaly will result in obscure morphological configurations of the root canal.

Enamel hypoplasia is considered to be one of the developmental anomalies affecting only the enamel structure. It refers to hypomaturation of the enamel.

This case report discusses endodontic therapy of a maxillary central incisor with enamel hypoplasia and two canals in one root.

CASE REPORT

A 15-year-old female was referred to the Endodontic Department at King Saud University, College of Dentistry, from the emergency clinic for further examination of the maxillary right central incisor. Clinical examination revealed a noncarious clinical crown with a well-defined horizontal line separating the tooth crown into two halves. The cervical half of the crown was covered by enamel, whereas the incisal half was discolored and covered by dentin. Maxillary and mandibular centrals, canines, and first molars were affected, and the condition was diagnosed as enamel hypoplasia.

Medical history was noncontributory. However, the mother gave a history of rubella and scarlet fever during pregnancy. The mother also claimed that she was severely sick during that period. She mentioned that the patient was always sick during the first 2 yr of life.

The central incisor was tender to percussion and palpation. Electric pulp tester and thermal tests elicited no response from the tooth. Radiographical examination showed one root and two clear root canals with no periapical changes (Fig. 1). A necrotic pulp with acute apical periodontitis was diagnosed.

After rubber dam isolation, the tooth and operating field were disinfected with 30% hydrogen peroxide, followed by 5% iodine solution. The tooth and operating field were resterilized after the access opening was established. Two

![Fig 1. Preoperative radiograph showing two canals.](image-url)
separate access openings were made, and two canals were located. The working length of both canals was checked radiographically (Fig. 2). The canals were instrumented, irrigated with 1% sodium hypochlorite, and dried with sterile paper points. A 2% iodine-potassium iodide was placed into the pulp space between the visits. At the obturation visit, the tooth was asymptomatic. The canals were irrigated with sodium hypochlorite and dried with sterile paper points. Obturation was done by using lateral condensation of gutta-percha and AH26 sealer cement. Access opening was sealed with composite restoration, rubber dam was removed, and postoperative radiograph was taken (Fig. 3).

**DISCUSSION**

Many reports of anatomical studies stated that maxillary central incisors have a single root and one canal 100% of the time (1–5). The only variation is the presence of lateral canals (2, 11, 12). None of the anatomical studies mentions the presence of developmental anomalies. When anomalies are present in a tooth, they may affect the form, size, and structure of the tooth.

Case reports of the maxillary central incisor with developmental anomaly are reported in the literature as gemination (9, 10).

Enamel hypoplasia is a defect that occurs as a result of any disturbance in the formation of the enamel matrix. The cause is usually of local, systemic, or hereditary origin (13, 14). The dentin, cementum, and pulp are normal, and the incidence of caries is low (15).

Exanthematous diseases such as scarlet fever may cause enamel hypoplasia, affecting teeth that form within the first year after birth or those that form somewhat later (16). As mentioned earlier concerning the case presented here, the mother had been sick during pregnancy and the child was ill during childhood. This might explain the enamel hypoplasia in this case (13, 14, 16). Slowey (17) pointed out the importance of radiographical examination in detecting an extra canal. Although the maxillary central incisor usually has one canal, the clinician must prepare himself for unexpected root canal morphology when performing root canal therapy.

Dr. Al-Nazhan is affiliated with the Department of Restorative Dentistry, Division of Endodontics, University of King Saud, College of Dentistry, Riyadh, Saudi Arabia. Address requests for reprints to Dr. Saad Al-Nazhan, BDS Department, Division of Endodontics, College of Dentistry, University of King Saud, P.O. Box 60165, Riyadh, Saudi Arabia 11545.

**References**