CORRESPONDENCE

Mandibular first molars with a medial root canal

Many anatomic variations occur in the mandibular first molars. As a first erupting tooth, mandibular first molars often suffer from caries and require root canal treatment. Although these teeth usually have three or four canals, the presence of a middle mesial and/or distal canal has been reported to be 1–15% and 0.2–3% for a mesial and distal canal of mandibular first molars, respectively. Due to the fact that an unidentified root canal impedes the removal of microorganisms that cause post-treatment diseases, the middle canals require investigation during root canal treatment.

Figure 1  Patient 1: (A) preoperative radiograph of tooth #36; (B) access opening after instrumenting six canals; (C) final radiograph after obturation of the six canals. Patient 2: (D) initial radiograph of tooth #46; (E) final radiograph after obturation of five canals; (F) two-year recall radiograph.
Here, we present two cases to illustrate the presence of a middle mesial and distal canal in a mandibular first molar.

A 45-year-old woman with a noncontributory medical history was referred for diffuse pain in the left lower jaw. Clinical and radiographic examination revealed large caries related to tooth #36 (Fig. 1A). The periodontal values for the area around the tooth were normal, and an electric pulp test (Parkell Electronics Division, Farmingdale, NY, USA) displayed an earlier response. A diagnosis of symptomatic irreversible pulpitis was made, and endodontic treatment was started. Under local anesthesia and rubber dam isolation, caries were removed and an endodontic access cavity was established. On inspection of the pulp chamber floor, six distant canal orifices were located (Fig. 1B). Following cleaning and shaping of the root canals, obturation was achieved with gutta percha and AH Plus (Dentsply-Maillefer, Ballaques, Switzerland) using a cold lateral condensation technique. The tooth was asymptomatic during a year’s follow-up period (Fig. 1C).

The other patient, a 37-year-old man also with a noncontributory medical history, came to our department with a history of acute pain. Clinical and radiographic examination showed large caries of tooth #46 (Fig. 1D). A loss of lamina dura and periodontal ligament widening related to the distal root apex was seen from the preoperative diagnostic radiograph. The electric pulp test showed the delayed response. From the clinical and radiographic findings, a diagnosis of symptomatic apical periodontitis was made, and endodontic treatment was performed as described above (Fig. 1E). The patient was asymptomatic during a 2-year follow-up period (Fig. 1F).

Root canal variations of the molars can present technical challenges regarding treatment. The mesial roots of the mandibular first molars have mostly one large canal until the individual is 11 years of age, but with the progress of secondary dentin deposition, separate canal systems are developed. Therefore, clinicians should take these age-related variations in the root canal system into account during clinical procedures. We performed endodontic treatment on molar teeth with completely developed root canal systems in 37-year-old and 45-year-old patients.

From the observation of an isthmus between two canals in the same root, it can be considered that a middle canal might exist. There are also ethnic differences in terms of the presence of a middle canal; the present case discuss the endodontic management of the mandibular first molars of Turkish patients. Treatment outcomes will be more predictable if the clinician has a more thorough knowledge of the root canal variations, aged-related changes, and ethnic differences related to root canal morphology.

References


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