Single-rooted maxillary first molar with a single canal: endodontic retreatment

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This case report presents an unusual root canal system in a maxillary first molar tooth: a single canal in a single root. The endodontic access cavity displayed only 1 canal orifice. This case demonstrated that: 1) clinicians must have adequate knowledge about root canal morphology and its variations; 2) the location and morphology of root canals should be identified radiologically before the root canal treatment; and 3) careful examination of radiographs and the internal anatomy of teeth is essential. (Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2008; 106:e66-e68)

Clinicians must have adequate knowledge about root canal morphology and its variations to achieve a technically satisfactory endodontic outcome.1 Therefore, the root canal system of maxillary molars must be examined meticulously by the clinician, preferably under magnification provided by a surgical operating microscope.2 The literature describes complex root canal systems in maxillary molars that may be difficult to manage.3,4 Variations often occur in the mesiobuccal roots,5,6 the most common finding being the occurrence of 2 canals. In maxillary first molars, cases of morphologic variations, abnormal numbers of roots, or the existence of C-shaped canals have been reported previously.5,6 Moreover, 410 and 511 roots with a corresponding number of canals have been reported in maxillary molars. Case reports with 4,12 5,13 and 6 root canals,14,15 have also been presented.

However, the configuration of 1 canal in a 1-rooted maxillary first molar has rarely been described in studies describing tooth anatomy and root canal anatomy on the basis of extracted teeth and/or using cross-sections.16 The present report describes the root canal retreatment in a maxillary first molar with 1 root canal.

CASE REPORT

A 45-year-old caucasian (Spanish) woman, whose medical status was noncontributory, was referred for endodontic retreatment of the maxillary right first molar. The tooth had been root-filled previously and restored, but had lost its coronal restoration 5 years before (Fig. 1), and the root filling had been exposed to oral environment during this time. The patient had pain on percussion. After adequate anesthesia and isolation with rubber dam, an endodontic access cavity was established. Only a single canal orifice was located (Fig. 2). The cervical third of the old root filling was removed using the K3 rotary files system (Sybron Endo, Orange, CA). The apical two-thirds of the gutta-percha/sealer were re-treated using conventional K-files (Maillefer; Dentsply Maillefer, Ballaigues, Switzerland) with chloroform. The criteria for completion of re-treatment were the presence of clean filings, no evident gutta-percha or sealer present on the files or paper points, and smooth canal walls. Increments of 0.05 mL chloroform were injected into the canal to soften the gutta-percha.

After cleaning and shaping, the canal was dried and filled with AH26 (Dentsply DeTrey, Konstanz, Germany) and gutta-percha using the System B (EIE Analytic Technology, Redmond, WA) (Fig. 4). Cavit (ESPE America, Norristown, PA), was used as temporary restorative filling material (Fig. 5) and the patient was then referred for a permanent restoration. The 2-year follow-up radiograph displayed normal periradicular appearance (Fig. 6).

DISCUSSION

The variability of the root canal system of multi-rooted teeth represents a challenge to both endodontic
Although the incidence of root variations is rare, as far as the prognosis of individual cases is concerned, their importance should not be underestimated. Root canal morphology should be examined further during treatment through the evaluation of radiographs taken from different horizontal an-
gles. The use of a preoperative radiograph and an additional radiographic view from a 20-degree mesial or distal projection is a good way to detect root canal morphology and anatomy.²,⁹

Case reports of variations in the number of root canals of maxillary first molars have been published.⁸,¹⁷,¹⁸ Beatty¹⁷ reported a maxillary first molar with five canals, three of which were in the mesiobuccal root. Bond et al.¹⁵ and Maggiore et al.⁸ reported maxillary first molars with 6 root canals. But aberrations such as 1 root canal have also been reported previously in maxillary second molars.¹⁹

Clinicians must have adequate knowledge about root canal morphology and its variations. The location and morphology of root canals should be identified radiologically before the root canal treatment. Careful examination of radiographs and the internal anatomy of teeth are essential.

REFERENCES

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