

When nature laughs at endodontists: Two case reports

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Case I: Three-rooted maxillary first premolar

A 34-year-old male patient was referred to our clinic with mild symptoms of pain and soreness owing to chronic apical periodontitis on tooth #5. The general practitioner referred the patient because she was unable to perform the RCT. The preoperative radiographs revealed three separate roots in the first upper right premolar (Figs. 1a–c). The access cavity was modified with a safe-end bur and a Start-X ultrasonic tip #1 (DENTSPLY Maillefer) in order to locate the third root canal. The negotiation of the distobuccal canal began with a 10.04 Micro-Opener and a ProTaper SX file (DENTSPLY Maillefer). Negotiation of the canal was facilitated by coronal pre-enlargement using ProTaper S1, S2 and SX files. After patency had been confirmed with a 08.02 K-file, the working length was determined with the electronic apex locator (iPex, NSK) and a glide path was established using PathFiles (DENTSPLY Maillefer) at 250 rpm and maximum torque.

Every endodontist knows that each tooth is different and has to be treated with care, paying attention to detail. There are various studies on root-canal anatomy, the configuration of canal orifices and the canals themselves.¹ Several scientific articles discuss the presence of additional canals in maxillary first premolars and mandibular first molars.

The percentage of additional root canals varies between 0 and 6% for the maxillary first molar and between 6 and 23% for the mandibular first molar.^{1–6} The root-canal treatment (RCT) of these teeth is challenging for every clinician and requires knowledge, patience and a variety of instruments and devices.

All three canals were shaped with ProTaper NiTi instruments. The last instrument used to length was a ProTaper F1 file and then apical gauging was performed. The final instruments were a ProTaper F2 file for the mesiobuccal and distobuccal canals and a ProTaper F3 file for the palatal canal. Copious irrigation with 5% sodium hypochlorite was performed throughout the RCT. Final irrigation entailed passive ultrasonic irrigation with 5% sodium hypochlorite, followed by ultrasonically activated 40% citric acid. A final rinse was done with 95% ethyl alcohol.

Obturation of the root-canal system was done according to the Continuous Wave of Condensation technique with Alpha II and Beta devices (B&L Biotech;



Fig. 2), and an orifice barrier was made using Gradia Flow (GC). After root-canal obturation, three radiographs were taken, one with normal angulation and two angled (Figs. 3a–c). The radiographs clearly reveal the complexity of the root-canal system and the 3-D obturation. Post-endodontic composite obturation was done with Miris 2 (Coltène/Whaledent).

_Case II: Three-rooted mandibular first molar

A 22-year-old male patient was referred to the clinic with pain in teeth #29 and 30. He was in good health, with mild to acute pain to percussion. The referring dentist was concerned about the complex anatomy, which was the reason for the referral. After taking a preoperative radiograph (Fig. 4), an access cavity through the crown was made using a Crown Cutter bur and a safe-end diamond bur (KOMET/Gebr. Brasseler). Cavity refinement was done with the Start-X ultrasonic tip #1 and a #3 Mueller bur (Mani, Inc.; Fig. 5).

Coronal pre-enlargement was necessary because of the calcified orifices of the root canals. This was done with a ProTaper SX file with brushing movements. Negotiation of the canals was done with a 10.02 K-Flexofile (DENTSPLY Maillefer) with the aid of Glyde Gel (DENTSPLY Maillefer). A glide path was established with PathFiles and shaping was done using the ProTaper System (DENTSPLY Maillefer). After apical gauging, the four canals were shaped to a ProTaper F3 file with 5% sodium hypochlorite irrigation. Final irrigation was done using ultrasonically activated 5% sodium hypochlorite and 40% citric acid. A final rinse was done with 95% ethanol. Obturation of the root-canal system was performed with the Alpha II and Beta devices using the Continuous Wave of Condensation technique, and flowable composite was used to create the orifice barriers (Gradia Flow; Fig. 6).

The post-endodontic build-up was made using a fibre post and composite (Core-X Flow and Ceram-X Duo, DENTSPLY DeTrey), and a final radiograph was taken (Fig. 7).

_Conclusion

When dealing with such challenging cases, one needs to have an immense amount of patience and a great deal of curiosity to discover the hidden secrets of the root-canal system. After unveiling all of the pulp chamber anatomy, one can continue moving towards the apical foramen to reach the endodontic goal: to clean, shape and fill the 3-D root-canal space the best way one can.

Editorial note: A complete list of references is available from the publisher.



_about the author roots



Dr Bojidar Kafelov graduated from the Medical University of Sofia Dental School in 2009. He has completed many continuing education courses in the field of endodontics. He has been a practising endodontist at the Svedent dental clinic full time since 2009 and is a member of the Bulgarian Endodontic Society and the Bulgarian Society of Aesthetic Dentistry. Dr Kafelov can be contacted at b.kafelov@gmail.com or via the dental clinic's website, www.svedent.com.