

Shaping a Type V mandibular premolar with VDW.ROTATE

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Fig. 1

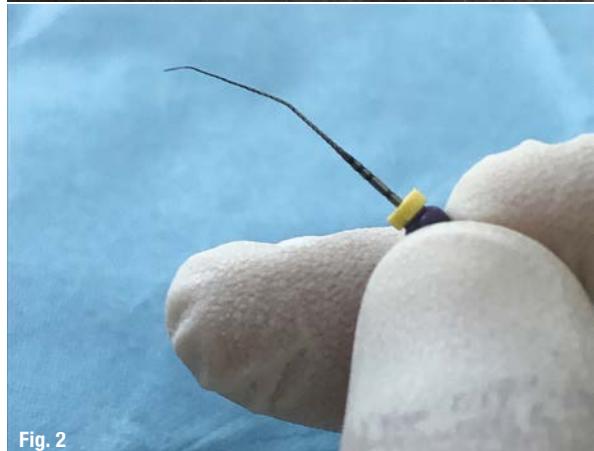


Fig. 2

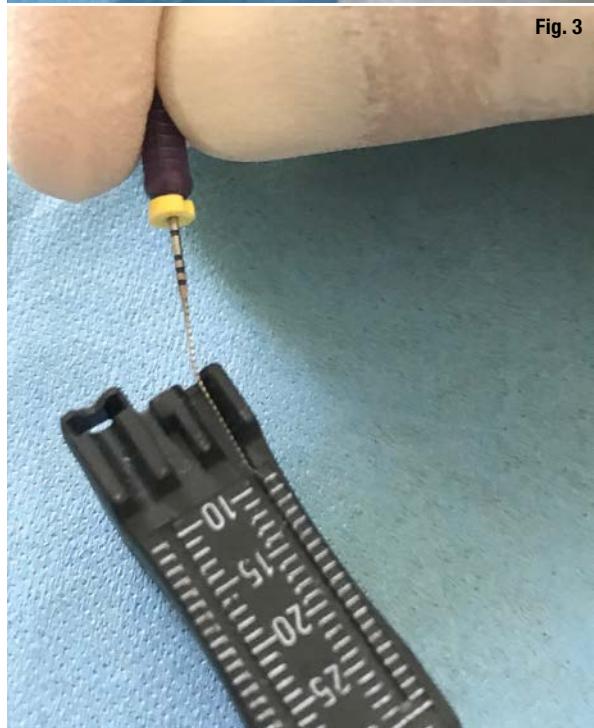


Fig. 3

Many years ago already, the anatomy of root canals was described as showing variability and being of a complex nature.¹ According to Vertucci, the mandibular first premolar has one canal at the apex in 74.0 % of teeth, two canals at the apex in 25.5 % and three canals at the apex in 0.5 % of teeth.²

Case report

A 63-year-old female patient was referred to my UK practice for root canal therapy of tooth #44. The tooth did not respond to the cold sensitivity test and was slightly tender on percussion. The patient complained of previous episodes of swelling of the buccal gingiva. From analysis of the periodical radiograph, a wide occlusodistal cavity and a J-shaped radiolucency in the apical area of this tooth were noticeable (Fig. 1). The root canal was visible until 8 or 9 mm from the apex and then disappeared. This kind of disappearance is often present in teeth with a Type V anatomy, where one root canal leaves the pulp chamber and divides shortly before the apex into two separate and distinct root canals with separate apical foramina (Vertucci classification³). This kind of root canal was very difficult to shape with the first generations of nickel-titanium files and required extensive removal of sound dental tissue in order to gain straight access to the canals.

The pulp chamber was opened with a high-speed hand-piece and a round bur, and the root canal system rinsed with 5 % sodium hypochlorite and then scouted with a pre-bent ISO size 10 C-PILOT file (VDW). The buccal canal was easily scouted. Orientating the tip of the C-PILOT file lingually, the lingual canal was explored with difficulty and the file came out bent at 10 mm from the tip (Figs. 2 & 3). Preliminary working lengths were immediately established using an apex locator (VDW.CONNECT Locate, VDW) and the C-PILOT file and these were 20.5 and 21.0mm.

In cases with abrupt curvature in the coronal or middle third, it is recommended to use flexible instruments very resistant to cyclic fatigue. The resistance to cyclic fatigue

Fig. 1: Pre-op radiograph. **Figs. 2 & 3:** The ISO size 10 C-PILOT file bent by the abrupt curvature of the entrance to the lingual canal.



Fig. 4

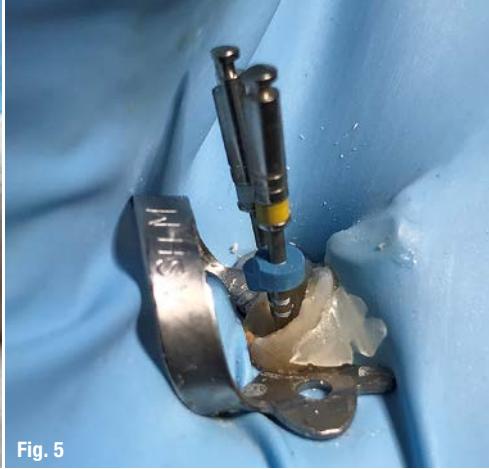


Fig. 5



Fig. 6

Fig. 4: A VDW.ROTATE 20/0.05 file pre-bent before insertion into the lingual canal. **Fig. 5:** VDW.ROTATE 15/0.04 and 20/0.05 files inserted into the root canals for the working length radiograph. **Fig. 6:** Working length radiograph.

depends on the alloy used to produce the file and the core of the file. For those reasons, I decided to shape this tooth with the basic sequence of the VDW.ROTATE system (VDW). The blue alloy confers to this file great resistance to cyclic fatigue and permits easy bending of the tip in order to facilitate introduction of the file into an abrupt curvature in the middle third (Fig. 4). The shaping started with the first two files of the basic sequence: the 15/0.04 and 20/0.05 were used with a pecking motion in accordance with the manufacturer's instructions regarding the torque limit and the revolutions per minute. All the shaping was carried out using the VDW.CONNECT Drive (VDW) connected to the apex locator under continuous working length control. In the lingual canal, the files were

pre-bent and then introduced manually into the curvature. After that, the file was easily connected to the hand-piece thanks to its very small head.

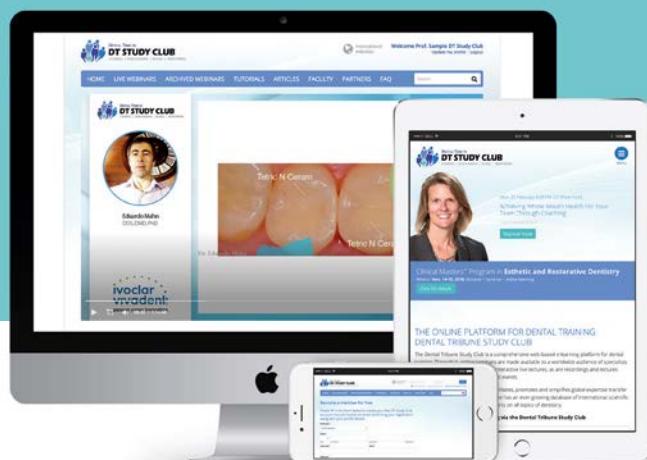
A radiograph to confirm the final working lengths was carried out with an endodontic ring holder and the VDW. ROTATE 15/0.04 and 20/0.05 files (Figs. 5 & 6). The last instrument at the apex was the 25/0.04 file owing to its flexibility and reduced core (compared with the 25/0.06 file) using the same strategies as in the previous steps.

Final rinses with EDTA solution and sodium hypochlorite were followed by activation of the solution with a pre-bent EDDY tip (VDW, Fig. 7) for 20 seconds. The canals were

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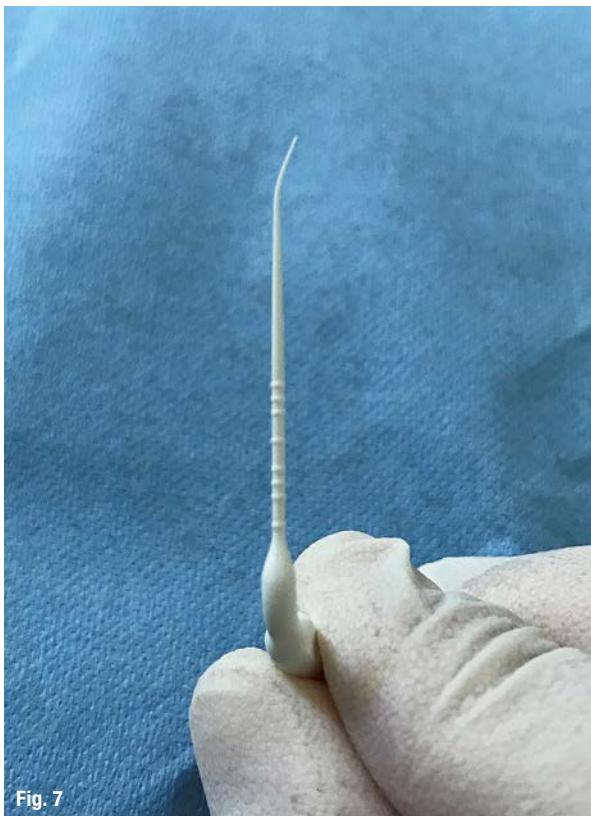


Fig. 7



Fig. 8



Fig. 9

Fig. 7: Pre-bent EDDY tip. **Fig. 8:** Intra-op radiograph. **Fig. 9:** Post-op radiograph.

then dried and filled with AH Plus (Dentsply Sirona) and two gutta-percha cones matching the VDW.ROTATE instruments (VDW) and made of a more heat-conductive gutta-percha with a lower melting temperature using the continuous wave technique up to the bifurcation.

A radiograph was taken (Fig. 8) to check the root canal fillings and then a fibre post and core build-up were carried out. The final radiograph showed good filling of the root canals with small extrusions of the sealer through the buccal foramen and a lateral canal (Fig. 9). The patient was referred to her dentist for permanent restoration of the tooth. Six months of follow-up was planned in order to control the outcome of the treatment.

Conclusion

Martensitic files are easily bendable and, if pre-bent, permit the clinician to bypass ledges and shape very curved Type V canals mechanically. In addition, these files are more resistant to cyclic fatigue. The VDW.ROTATE system offers files of different ISO sizes and the finishing files have two different tapers: the 0.04 can be used safely in very difficult anatomies because having a reduced core increases cyclic fatigue resistance.

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

about

Dr Vittorio Franco graduated in dentistry in 1990 from the Sapienza University of Rome in Italy. He works in Rome and London in practices limited to endodontics.

Dr Franco is the author of scientific articles on endodontics published in national and international journals and of chapters in books dealing with endodontics. He won the Riccardo Garberoglio Award for Research of the Italian Society of Endodontics (SIE) in 2006 and 2016, and the prize for the best presentation at the 2010 ROOTS SUMMIT. He is a reviewer for many national and international journals and served on the scientific committee of the *Giornale Italiano di Endodonzia* (Italian journal of endodontics). During his career, he has given pre-congress courses, workshops and presentations at many national and international meetings and lectured in a number of university courses.

Dr Franco is President of SIE and an active member of the Accademia Italiana di Odontoiatria Microscopica (Italian academy of dental microscopy). He is Specialist Member and Treasurer of the European Society of Endodontontology (ESE).