Getting to the 00.00 point

By Prof. Philippe Sleiman, Lebanon

Anatomy and nature still teach us on a daily basis. Root canal treatment, while it is becoming a routine procedure, surprises and sometimes bad cases still occur. In this article, I will present two unusual case reports from my own practice.

Case 1

The first is a clinical case that in my experience posed rather a challenge. The patient was referred to my office suffering from paresthesia of his lower lip on the one side after a root canal treatment had been performed on his mandibular second molar.

The preoperative radiograph (Fig. 5), which was sent by his dentist, showed a well-perforated root canal treatment that did not explain the clinical manifestations, but looking closely at the apical part one could observe that the obturation material lay in proximity to the apex of the mandibular canal. Immediate retreatment was required. Unfortunately, the material that had been used was the plastic carrier Thermafil (DENTSPLY), and it was extending into the nerve, causing the inflammation, and the inflammation was causing pressure on the nerve. The Thermafil was removed from the canals—never an easy thing to do—using K3XF files (Sybron-Endo; Fig. 6) and without any solvent in order to avoid any more damage to the nerve in case of leakage. I set the Elements Adaptive Motor (Kerr Endo; Fig. 7) and with cold physiological saline in order to reduce the inflammation by cooling down the roots. All of the canals were irrigated with the cold saline for at least 20 minutes. The reason I used this technique was to immediately lower the inflammation inside the mandibular canal, which is not well innervated. Reducing the inflammation inside and around the nerve can take a while and I needed to lower it as soon as possible. The canals were kept empty with a cotton pellet inserted inside the access cavity and a hermetic seal on top. I asked immediately for a CT scan (i-CAT; Imaging Sciences International) to be taken in order to study the case. To my surprise, I found that the position of the mandibular canal was different from the contralateral one and that it was in contact with the apex of the second molar where the root canal treatment was performed (Fig. 7).

The patient was prescribed anti-inflammatoratories and kept under observation. Several days later, his lip was normal in function, but there was still some loss of sensibility. Thirty days postoperatively, another CT scan was taken (Fig. 8) in order to check the inflammation inside the nerve itself, but during this time we continued to irrigate the canal with cold physiological saline at intervals of three days.

Until the patient reported the slow return of sensibility, I decided to seal the canals, and it was for me the moment of truth, since I knew that I needed to seal the canals to the 00.00 point and place a small puff of sealer at the end too. Carefully adjusted master cones were placed inside the canals with a very tight tug back. The correct amount of sealer was applied in order to avoid any excess and gentle warm obturation was performed with the Elements Obturation Unit (SybronEndo). The integrity of the obturation was checked with a CBCT scan (Figs. 9 & 10).

Six months later, a conventional radiograph was performed (Fig. 11) in order to follow up on the case, the patient was doing very well with a completely functional and sensitive lip. The final radiograph showed a sealed root canal space and none of the sealer inside the mandibular canal remained. The conclusion of this case is that we will never know the reason for such a difference in the position of the mandibular canal between the right and left of the mandible, and that we need to respect the 00.00 point of the length of the roots—nothing more and nothing less. And the most important conclusion is that nature and the human body have a truly amazing healing power once the cause of inflammation has been eliminated.

Case 2

In the second clinical case, the patient presented at the office with problems biting on his molar, with a fistula on the buccal side of his mandibular first molar. The preoperative radiograph showed an acceptable root canal treatment performed in accordance with recommendations (Fig. 12).

Studying the radiographs in detail, we could obviously see that something was not right in the apical area of the mental canals. A closer look indicated some kind of pathology in the coronal part of the distal canal and possibly a cervical resorption or an internal resorption that might explain the fistula in this area.

Again K3XF files were used to retreat the case, with the proper irrigation technique using the Endo Vac. A 50.04 file or the MJ 5 file in TF Adaptive mode was used to shape the last 3 mm of the canals. Adequate master cones were prepared with a very strong tug back placed 0.5 mm short of the working length.

My choice was the Elements Obturation Unit in order to perform the sealing of the root canal system. The choice of the plunger was made, selecting the largest plunger to reach 5 mm from working length in each canal, in order to generate hydraulic pressure and to seal in 3D during the down-pack or the first wave of obturation. Manual plungers were also adjusted to reach 5 mm and 10 mm from the working length. Medium viscosity was chosen for the cartridge with a large opening and the extruder was set to two arrows or fast injection. The sealer was placed on the cones and inserted into all four canals.
With endodontic treatment, there is the risk of superinfection. The French laboratory ITENA Clinical claims to have solved this problem with its revolutionary Irrigatys handpiece.

This two-in-one device is used for both irrigation and agitation of the cleaning solution inside the root canal. To achieve this, the laboratory put a perforated metal tip at the top of the handpiece to deliver the cleaning solution in an oscillating movement.

A removable tank allows the root canal to be treated successively using sodium hypochlorite and EDTA. The irrigation line directs the cleaning solution through the metal tip.

The patented technology, achieved after six years of research, optimises the results of a very complex procedure, according to the company. Ambidextrous, light and flexible, the device has excellent ergonomics, providing intuitive handling. Irrigatys recharges on a charging station that can be fixed to the chair.

Irrigatys is available with all of its accessories in a starter kit. The metal tips are available in two sizes, 17 mm and 21 mm, to cover all clinical cases.

The root canal system has a very complex anatomy and this is not often apparent on radiographs. Performing a partial root canal treatment and placing one cone is not the gold standard in root canal treatment. Sealing the root canal system is the final step performed by the endodontist to complete the root canal treatment, but it should be concluded with a hermetic seal on top of it.

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