

IrriFlex. Case Report

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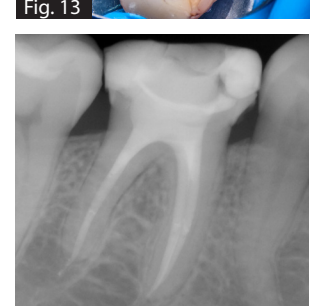
The endodontic treatment of teeth with curved canals is always challenging for the practitioner in terms of shaping, cleaning and filling of the endodontic system.

It is well known that advancements have been made in the flexibility and performance of root canal shaping NiTi instruments, that are able to follow the anatomy of the tooth and to remove pulp tissue and bacteria, even in difficult anatomies. On the other hand, in vitro and ex vivo studies proved that the apical third is the zone in which eradicating bacteria is the most difficult goal to achieve, since untreated areas after instrumentation can range from 10% to 50%¹: then, the action of irrigating solutions is of primary importance for the success of the therapy. Safely bringing an adequate volume of irrigant as close as possible to the working length has been the target of the irrigation tips available on the market: several designs and materials have been tested in order to give the clinician the best feeling in terms of cleaning efficacy and easiness of use².

Case 1

A 40 years-old patient was referred to our clinic for endodontic retreatment: the patient felt pain while chewing on a lower right first molar. The pre-operative x-ray showed that the root canal lumen was visibly diminished and the pulp chamber had been filled with flowable composite (Fig. 1), while the clinical exam showed a large and abraded composite restoration. Rubber dam was placed on the tooth in order to isolate the operative field³ (Fig. 2) and the root canal treatment was began. The first step of a correct shaping of the root canal system is the access cavity⁴: it ideally has to be the coronal projection of the root canals and it is meant to be as small as practical. The coronal composite was carefully removed with a diamond-coated bur as soon as the pulp chamber floor was reached (Fig. 3). After designing the access cavity, the carboxy cement that had been placed in the root canals in the primary treatment was removed, and the root canal openings were sought and found

with the help of the operative microscope (Fig. 4). Subsequently, it was managed to remove the cement from the root canals. Since the primary treatment had not respected the basic principles of shaping, cleaning and filling tridimensionally the root canal system, it was necessary to consider as the pulp was still present in the root canals. The scouting phase was executed, first with thin stainless steel manual instruments and NiTi rotary files (Fig. 5), then NiTi reciprocating files were used to shape the root canal system⁵ (Fig. 6). After root canal enlargement, irrigation was performed



by means of 5% sodium hypochlorite carried by a 0,3mm stainless steel side-vented needle (Fig. 7), trying to bring the needle tip as close as possible to the working length⁶.

The fluid was then activated with sonic inserts⁷ according to the indications by Tonini et al.⁸ (Fig. 8). The root canals were then dried with aspiration (Fig. 9, 10) and paper cones (Fig. 11).

The obturation phase was carried out with warm gutta-percha according to the continuous wave technique (Fig. 12, 13), then a provisional obturation was placed and the patient was sent back to the referring dentist for the final indirect restoration (Fig. 14).

Case 2

A 56 years-old patient came to our office complaining of an intense pain on tooth 3.8.

The element showed an extended carious lesion (Fig. 15) and the x-rays confirmed that the decay was in proximity to the pulp chamber (Fig. 16).

A lower alveolar nerve block was executed, then rubber dam was placed and the decay was removed with the help of a microscope (Fig. 17-19).

After removing all the decayed tissue, the access cavity was completed trying to be extremely conservative and the root canal openings were found and enlarged with the help of ultrasonic tips (Fig. 20).

The scouting of the root canal was executed with thin hand files (Fig. 21, 22), then the shaping procedure was carried out by means of reciprocating NiTi files (Fig. 23, 24)⁹.

The irrigation phase was executed with IrriFlex, a novel polypropylene irrigation tip that has a 2-side vented exits (Fig. 25-27), then the irrigant activation was done with sonic tips. Shaping and irrigation were alternated until the root canals were looking clean and appropriately tapered (Fig. 28-32)^{10,11}.

Paper cones were then used to dry the root canals (Fig. 33, 34) then, in this case, the obturation was done with single cone and bioceramic sealer (Fig. 35, 36).

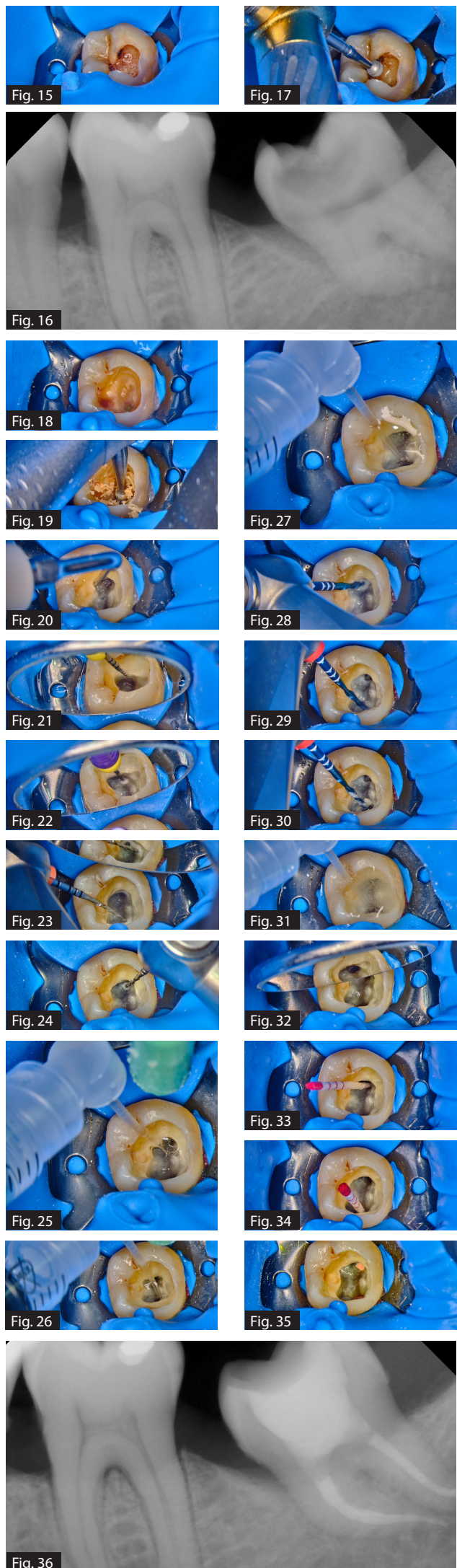
The access cavity was sealed with composite material, then an indirect restoration was booked.

Comment

The clinical cases were executed by the same experienced practitioner and both had a favorable outcome.

The choice relative to the clinical protocol were led by the clinical scenario. If there were no difference in the shaping system selected (since the combination between manual scouting and reciprocating NiTi files permitted to shape the root canals decreasing the risk of instrument fracture, even in presence of strong curvatures), the irrigation tip and the obturation method selected were different.

The different choice of irrigation tips was due to the



availability of the products and to the anatomy of the root canals. Since it was rational to suppose that mechanical shaping was not able alone to remove in toto pulp remnants, smear layer and bacteria, irrigation played an important role in both cases.

In the first case, a thin metal side-vented tip was used. The root canals were quite straight, so this kind of tip permitted a good penetration of sodium hypochlorite into the root canal and the presence of a lateral exit for the irrigant prevented its extrusion in the peridontium. In the second case, where the curvature of the roots was more pronounced, a metal tip (even if pre-bent) would not have permitted to bring the irrigant close to the working length. This happens because metal needles tend to block towards the walls of the canal, diminishing the volume of irrigant reaching the apex, with a less effective fluid dynamics¹². Considering this statement, a soft body polypropylene irrigation tip, IrriFlex (Produits Dentaires SA, Vevey, Switzerland), was chosen for this case. IrriFlex smoothly reached the working length, without showing any problem of penetration into the prepared root canal, thanks to the capability of its body to follow the shape of the root, and allowed bringing to the apex a high irrigant volume. The presence of length marks on the body of the tip helped the clinician knowing effortlessly the position of the needle with respect to the working length. The solution delivery was remarkably effortless as a soft pressure on the syringe plunger was enough to irrigate. IrriFlex was effective and safe, because of the back-to-back two side vent design of the tip that

prevented the irrigating solution from extruding into the periapical tissues and helped achieving clean canal walls (that appeared glossy when watched with the operative microscope) in a short time.

As regards the obturation technique, the warm gutta percha obturation permits to fill tridimensionally the root canal system, whereas the bioceramic sealer finds its major indication when the complex anatomy of the tooth requires a sealer with antibacterial activity and high biocompatibility.



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