COMBINED SURGICAL AND NONSURGICAL — endodontic retreatment for the management of an unusual clinical case

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Introduction

The ultimate goal of endodontics is to treat or to prevent endodontic pathology by properly cleaning, disinfecting and filling the complete root canal system. This is generally achieved by one of the three major endodontic therapies:

1. Orthograde or conventional endodontic treatment is delivered when the tooth presents with pulpal or periapical pathology and has not received any previous endodontic therapy.

2. Nonsurgical endodontic retreatment is delivered when the tooth has been treated previously, but the periapical pathology persisted or reoccurred after a period and the tooth is accessible using a coronal approach.

3. Surgical endodontic retreatment is generally performed when the endodontically treated tooth still presents with a periapical pathology, but a coronal approach is not feasible because of prosthetic restorations or if it is not able to resolve the periapical problem. In these cases, the incision of a surgical flap and retrograde management of the apical third of the root is required.

Even though the majority of endodontic cases are treated using one of the above-mentioned modalities, clinical situations arise in which the orthograde approach or the surgical approach alone is not able to clean and disinfect the complete root canal system and to provide a hermetic apical seal. In these cases, a combined orthograde and surgical approach is required. Very often, these are cases in which the tooth received previous endodontic treatment that did not resolve the endodontic pathology and caused morphological alteration of the apical third of the root, requiring surgical intervention to be properly managed. The present article reports on an unusual clinical case treated by nonsurgical endodontic retreatment followed by surgical endodontic retreatment in order to remove a foreign metallic object from the periapical tissue and to properly treat the apical third of the root. The object was afterward identified as a wrongly positioned endosseous implant that was responsible for the symptomatology.

Case report

A 57-year-old female patient was referred to our clinic in order to evaluate a symptomatic tooth #23. The patient had spontaneous pain in the left upper jaw, in the vestibule of the tooth #23. At the clinical examination, the tooth presented with a composite restoration, was negative to the vitality test, and was sensitive to percussion and palpation. The clinical examination revealed the presence of a scar in the vestibule of the left upper jaw due to a previous surgery (Fig. 1). The radiographic examination showed previous endodontic treatment of tooth #23, a shortening of the root and an apical radiolucency associated with a suspected gutta-percha cone or a radiopaque post beyond the apical third of the root (Fig. 2). The anamnestic data were noncontributory. On the basis of the clinical and radiographic examination, a diagnosis of previous endodontic treatment with a symptomatic periapical lesion was made. Since the material in the apical third was thought to be a gutta-percha cone of larger size, and assuming it would be possible to remove it with an orthograde approach,
nonsurgical endodontic retreatment was suggested to the patient.

The tooth was anesthetized, a rubber dam was placed and an access cavity was created in order to reach the root canal. After removal of the old gutta-percha filling material up to the apical third of the root, the endodontic file was unable to progress farther and a solid stop was felt. Exploration of the apical third under an operating microscope was performed. Under high magnification, the presence of a metal ring tightly wedged in the apical part of the canal was seen (Fig. 3). The metal ring was filled with old gutta-percha. The intraoperative radiograph with the file in place revealed the full length of the metal post extruding into the periapical tissue (Fig. 4). The multiple attempts to remove the metal object via an orthograde approach were unsuccessful. The tooth was medicated with calcium hydroxide and the patient rescheduled for surgery at the next appointment.

At the next visit, the patient was anesthetized, and under rubber dam isolation, the
tooth was opened and the canal filled with a pulp canal sealer and warm gutta-percha released from the Obtura II syringe (Obtura Spartan Endodontics). After completion of the root canal filling, the surgical treatment followed. A paramarginal flap was incised (Fig. 5), and after elevation of the soft tissue, an endosseous implant became visible under the mucosa (Fig. 6). The implant was wrongly positioned in the submucosa rather than in the bone and was actually responsible for the painful symptomatology.

In order to eliminate the metallic object, the bone around the post was gently curetted (Fig. 7) and the implant was vibrated with ultrasonic tips. The implant was very tightly wedged in the root, and it was thus decided to cut the apical part of the root containing the metallic post. Once the apical part of the root, together with the metal post, had been removed (Fig. 8), inspection of the resected root surface was performed under the operating microscope under high magnification. The resected root presented with a metal ring that corresponded to the cave part of the implant (Fig. 9). Since the metal ring contained old gutta-percha that was potentially infected, attempts to loosen the metal ring with ultrasonic tips were made (Fig. 10). Using ultrasonic tips, the metal

Fig. 5
A paramarginal rectangular flap was raised to reach the apical third of the maxillary canine.

Fig. 6
Once the flap had been raised, an endosseous implant became visible under the mucosa.

Fig. 7
The implant was released on the sides.

Fig. 8
The implant was removed.

Fig. 9
Exploration of the resected root surface at high magnification. Note that the metallic post was filled with gutta-percha at the bottom and strongly engaged in the root canal.
The metallic ring was removed (Fig. 11). The apical part of the root was further cleaned with ultrasonic tips and filled with grey mineral trioxide aggregate (MTA; Figs. 12 & 13). The surgical flap was closed using 7-0 monofilament sutures (Fig. 14). The immediate postoperative radiograph showed good adaptation of the MTA in the apical part of the root (Fig. 15). The sutures were removed 48 hours after the surgery (Fig. 16).

At the following control appointment, the patient was asymptomatic and the soft tissue showed good healing. The patient was recalled one and three years after the surgery. At the recall appointments, the tooth was asymptomatic and showed good stability. The three-year follow-up radiograph showed bone regeneration and reformulation of the lamina dura around the amputated root (Figs. 17 & 18).

The patient was referred to our clinic for endodontic treatment on a different tooth ten years after the surgery. A control of tooth #23 was done. It had remained symptom-free, and the ten-year follow-up radiograph showed a stable bone condition and the absence of any apical radiolucency (Fig. 19). Inspection of the soft tissue showed barely visible evidence of the incision (Fig. 20).
Discussion

The present case report has demonstrated that sometimes an approach combining both orthograde and surgical treatment is required in order to treat previously endodontically treated teeth and to provide a long-term favorable outcome. The decision to proceed surgically or nonsurgically is sometimes determined by the intraoperative conditions. It should be noted that CBCT was not available to the clinicians at the time of the surgery. Nowadays, preoperative examination using CBCT provides valuable information for the diagnosis and treatment of endodontically compromised teeth. Furthermore, the case report has shown that the microsurgical approach under the high magnification of the operating microscope, together with the use of dedicated ultrasonic tips and biocompatible material, was crucial for the long-term success of the treated tooth.

Fig. 15
Post-op radiograph.

Fig. 16
The condition of the soft tissue immediately before suture removal.

Fig. 17
Radiographic control three years after surgery. Note the good reapposition of the bone and the reformation of the lamina dura around the amputated root.

Fig. 18
Soft-tissue control three years after surgery. Note the esthetic healing of the soft tissue. Teeth #22 and #23 presented with new cervical fillings.

Fig. 19
Radiographic control ten years after surgery. The tooth had maintained a stable bone condition and no apical radiolucency was visible.

Fig. 20
Soft-tissue control ten years after surgery.