Endodontic Microsurgery as a Complementary Treatment of an Orthograde Endodontic Retreatment with Silver Points Obturation.

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The endodontic retreatment is indicated in cases of a failure of a previous endodontic treatment. The main objective of the endodontic treatment and the retreatment is to clean and disinfect the entire length of the root canal system up to a healthy level (Siqueira et al 2000). When, through a meticulous treatment, such objectives are achieved, success rates can exceed 94% (Imura et al. 2007; Lazarski et al. 2001).

In order to clean the root canal system to achieve the best prognosis of a retreatment, an important step is the total removal of the root canal filling obtaining a new access to apex. Improper cleaning of canals, especially the apical third, predisposes endodontic failures (Sjogren et al 1990; Nair PN et al 1990). In some clinical situations such as the presence of post and core, separated instruments and silver points, this free access to the apex is not always easy. Actually, this is one the most difficult operative procedures in endodontics.

These materials, specially the metal materials, can cause severe obstructions by blocking the passage of an endodontic instrument. An intentional leaving of part of these materials into the canal can leads to an insufficient endodontic disinfection. A failure in removing the endodontic obstruction may result in a deficient cleaning, shaping and filling of the root canal system. These clinical situations potentially decrease the success rate of the retreatment. Considering this microbiological issue, the attempt to remove these materials must be always undertaken (Gluskin et al 2008).

Silver points were used and indicated as a root canal filling material. However, they have shown corrosion in a wet environment. The byproducts of this chemical reaction can cause staining and inflammation in the surrounding tissues, especially in the periapical area. Moreover, the lack of plasticity does not allow their good adaptation to the root canal walls. It makes them a less favourable filling material. Nowadays, new material and contemporary techniques can provide much better options.

When making the decision to remove a silver point, factors such as periapical diagnosis, location, root curvature, length, size of silver point, coronal extension, remaining dentinal thickness, and risks of iatrogenies during the attempt must be considered.

A technique commonly used for removing these materials is to achieve a bypass with a manual file. This way, the fragment can be drawn to the pulp chamber and then removed. Another removal technique is by using an ultrasonic vibration on the fractured fragment, associated with the use of a dental operating microscope. The Silver points are very delicate and brittle. The application of ultrasonic vibration can cause an instrument separation. Due to this, the power vibration must be set under 20%. This low vibration can detach de Silver Point from the canal wall, and it can then be drawn to the pulp chamber and finally removed. Combined techniques such as bypassing and ultrasonics have been commonly used in the modern endodontics.

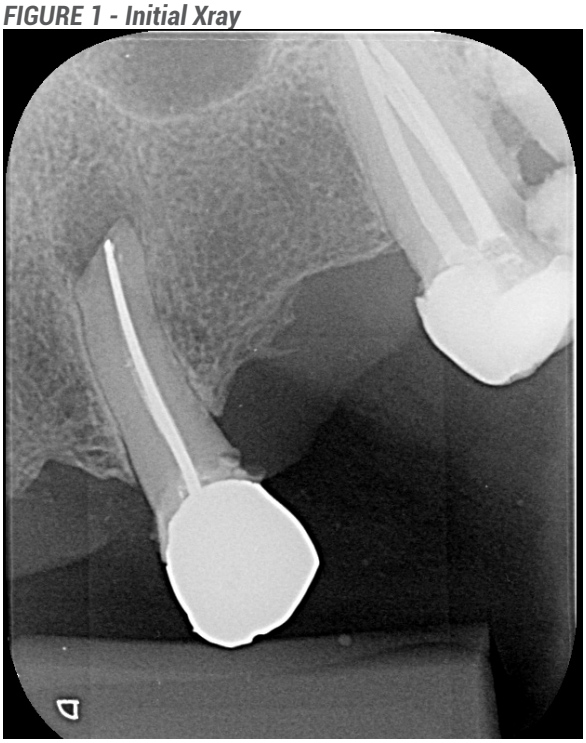
However, procedural errors during endodontic procedures may occur. Yousuf W et al. 2015 made the digital radiographic evaluation of 1748 endodontically treated teeth and found procedural errors in 32.8% (574 teeth) of them. In endodontic retreatment with the presence of a Silver Point, a common technical

complication is the breakage of a silver point. These accidents may compromise the treatment and the prognosis of the clinical case. In these situations, it is necessary to perform additional procedures to resolve the problem.

CLINICAL CASE

A 68- year old female patient, ASA I, pulse 64 bpm, BP 116X 68 mmHb, SpO2 98%, Temperature 36.5oC, came to the dental office complaining of constant, low intensity, spontaneous pain, in the apical and buccal area of tooth 23 (FIGURE 1). She was presenting intra-oral edema, pain while chewing and vertical percussion. She reported having undergone endodontic treatment in tooth 23 over 35 years ago. In the periapical radiographic exam it was possible to visualize an inefficient endodontic treatment, with a Silver Point Endodontic Obturation and the presence of a symptomatic apical periodontites. An acute apical abscess was diagnosed.

FIGURE 1 - Initial Xray

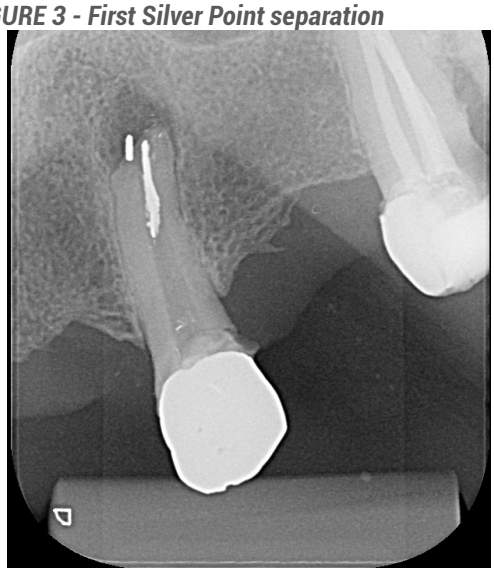


The proposed treatment was the endodontic retreatment, because in the previously performed treatment there was an inadequate canal cleaning and shaping, leading to an endodontic obturation with voids, maintaining the intracanal infection. An Endodontic Microsurgery was contra-indicated due to the presence of a previous insufficient endodontic treatment.

The Endodontic retreatment began with the access to the pulp chamber by using a Dental Drill Predator Turbo (Angelus - Londrina - Brazil). The cement around the neck of the Silver Point was removed with an Ultrasonic Tip E7D (HelseUltrasonics - Brazil) (FIGURE2). After the exposure of the coronal part of the Silver Point, an E5 – Conical Long Ultrasonic Tip (HelseUltrasonics - Brazil) was used to vibrate the body of the Silver Point. Although the low ultrasonic power set at 15%, a separation occurred (FIGURE 3). Due to the lack of adaptation of the filling material in the apical third, part of the Silver Point fragment was extruded into the periapical lesion.

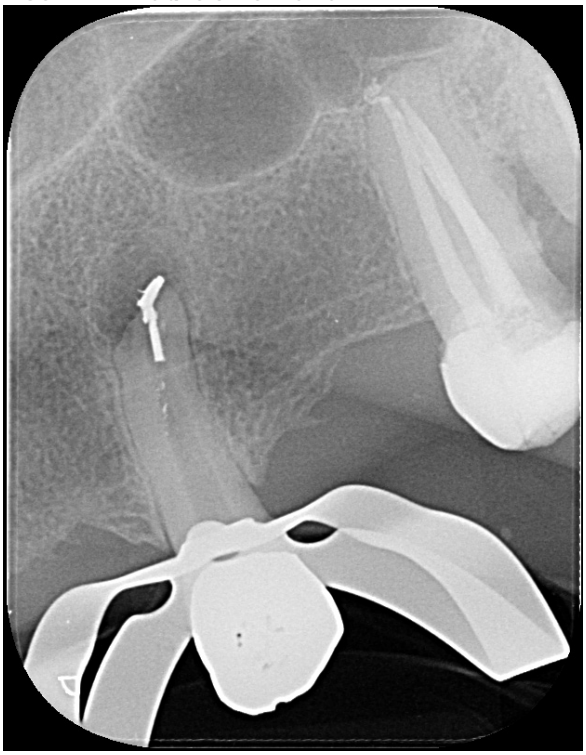
FIGURE 2 - Orthograde view from the coronal part of the Silver Point

FIGURE 3 - First Silver Point separation



The root canal shaping was done by using Reciproc File R25 (VDW - Germany) followed by Reciproc Blue File RB50 (VDW - Germany). During the endodontic retreatment, an abundant irrigation with 2.5% Sodium Hypochlorite was done. After several attempts to remove the remnant part of the Silver Point, another separation occurred (FIGURE 4). Part of the Silver Point was removed from the canal. However, the other fragment could not be removed.

FIGURE 4 - Extrude Silver Point



At this stage of the treatment, the proper disinfection control had not been achieved. The presence of the fragment, did not allow for a proper root canal disinfection. Due to that, the spontaneous pain, although decreased, has not ceased. As a result of failure to a properly infection control, a complementary surgery was proposed to remove the apical fragment. Before going into microsurgery, the root canal was finished.

The orthograde endodontic retreatment was carried out by a final rinse with EDTA 17% passively ultrasonic activated followed by filling the root canal using Gutta-Percha cones with Bio-C Sealer RTU (Angelus - Brazil). Bio-C Sealer RTU is a new Bioceramic Endodontic Sealer Ready To Use. It can be delivered straight from the syringe into the root canal. The Gutta-Percha cones were compacted with a vertical cold compacting technique(FIGURE 5).

FIGURE 5 - Endodontic obturation

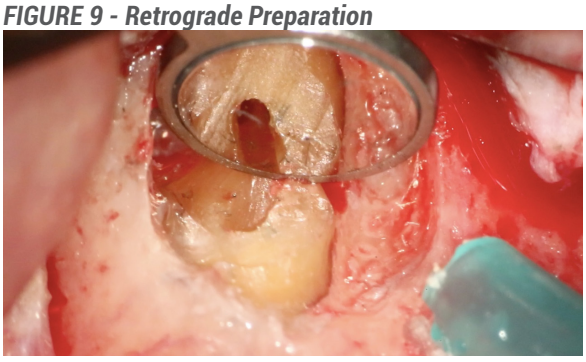
After the conventional endodontic retreatment, the patient underwent to an apical microsurgery. The osteotomy and the apicectomie where made by using an ultrasonic tip (W1-CVDentus - Brazil). The apical Silver Point fragment became visible at 12.5X magnification (FIGURE 6). In order to remove the apical fragment, an Ultrasonic Tip P1M (Helse Ultrasonic - Brazil) was used(FIGURE 7, FIGURE 8). After the Microsurgical Silver Point removal, the retrograde preparation was performed with the same Ultrasonic Tip (FIGURE 9).

FIGURE 6 - Apical third after apicectomie

FIGURE 7 - Microsurgical Silver Point Removal

FIGURE 8 - Silver Point Surgical Removal

FIGURE 9 - Retrograde Preparation



MTA, a bioceramic material, has been used as the first choice for retrograde fillings. Its superior features of marginal adaptation, biocompatibility, sealing ability in wet environments, induction and conduction of hard tissue formation, cementogenesis with consequent formation of normal periodontal adhesion, makes it the most suitable material for these clinical situations. In this case new bioceramic materials were used to fill the retrograde cavity. First a BioC Sealer (Angelus - Brazil) was used to fill the root canal space. An apical plug of MTA BioC Repair RTU (Angelus - Brazil) was placed on top of the root, sealing the retro-cavity (FIGURE 10, FIGURE 11).

FIGURE 10 - Retrograde Obturation

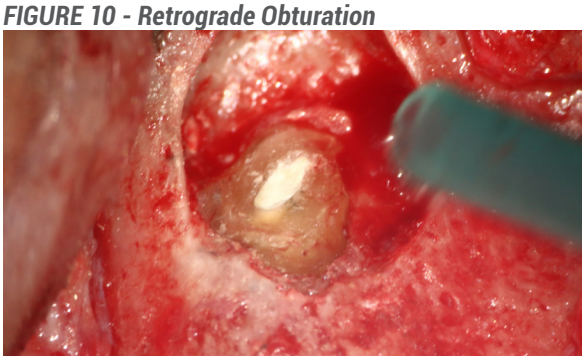
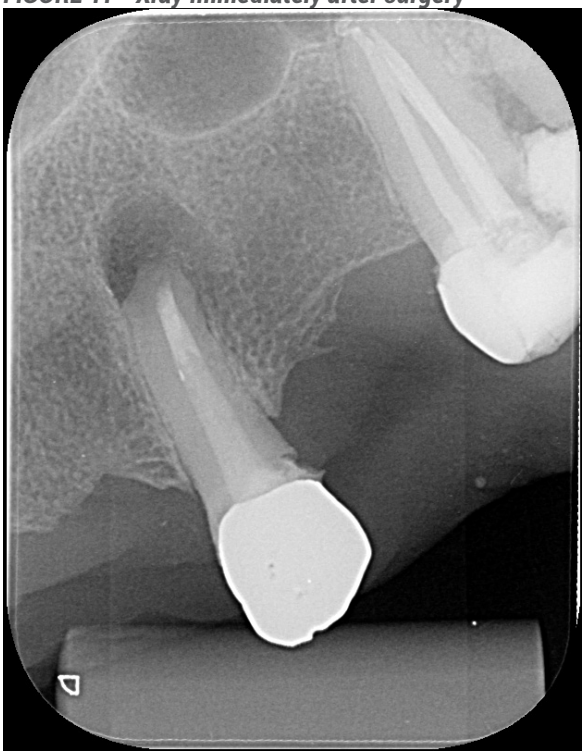
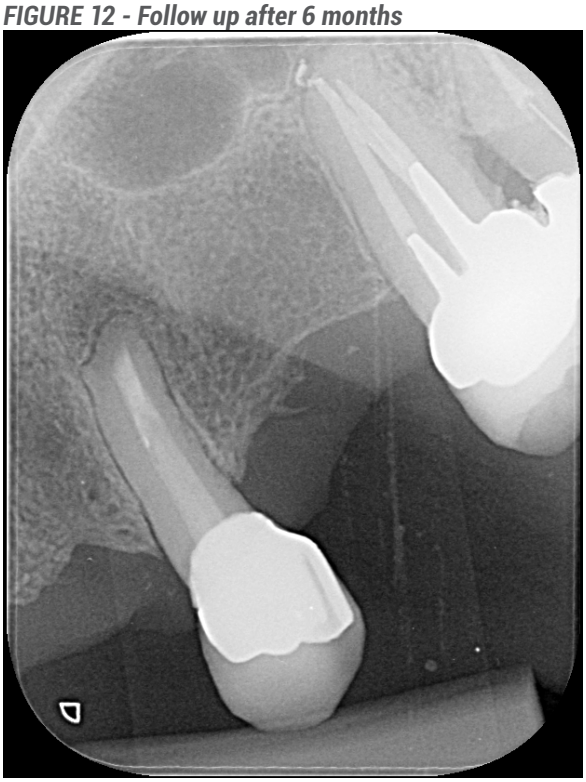


FIGURE 11 - Xray Immediately after surgery



The 6 months follow-up showed a very fast bone healing. Clinically she no longer had any signs or symptoms of an endodontic disease (FIGURE 12). The fast bone healing might be related to the release of Calcium from this new Bioceramic Repair Material which contains Calcium Tungstate as Radiopacifier instead of Bismute Oxide from its predecessor (conventional MTA). Moreover, the size of thebioceramics particles are smaller than MTA allowing for more contact with the surrounding tissues increasing the biological response.

FIGURE 12 - Follow up after 6 months



CONCLUSION

An adequate cleaning and shaping of the root canal system is of utmost importance for the success of endodontic therapy. The presence of an obliterating object inside the root can compromise the prognosis of the case. Therefore, it is extremely important to remove these obstacles.

However, depending on the severity of the case, some obstructions can not be removed with an orthograde treatment. In these situations, a complimentary microsurgery approach might be necessary. The postoperative radiographic and the clinical control of this clinical case show that complementary microsurgery can be a safe and predictable clinical option.

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