





PRESENTACIÓN DE CASO

Open Surgical Retreatment and Apicoectomy

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ABSTRACT

Introduction: apicoectomy is the surgical procedure of choice when conventional endodontic treatment fails and is considered the last resort to preserve the affected tooth. It involves resection of 2–3 mm of the apical root segment, retrograde cavity preparation, sealing with biocompatible materials, and debridement of surrounding periapical tissues.

Objective: to present a case managed with open surgical retreatment and apicoectomy due to persistent pain and paresthesia associated with a strip perforation (false canal).

Case Presentation: a 15-year-old White female patient presented with pain and paresthesia in an upper anterior tooth previously treated with root canal therapy. Occlusal radiography revealed an unobturated main canal and a false canal, indicating endodontic failure. Open surgical retreatment and apicoectomy were performed using silver amalgam for retrograde filling. Clinical and radiographic follow-up over 18 months confirmed complete periapical healing and absence of symptoms.

Conclusion: apicoectomy of a root compromised by a false canal represents a viable therapeutic alternative when non-surgical retreatment is not feasible. It enables preservation of the dental organ and its aesthetic, phonetic, and masticatory functions, while also supporting the patient's psychological well-being—particularly crucial in adolescent care.

Keywords: Apicoectomy; Endodontics; Retreatment.

INTRODUCTION

Although success rates of modern endodontic treatments continue to rise, procedural errors or accidents—including strip perforations (false canals)—can still occur.⁽¹⁾

Apical surgery (also known as endodontic surgery or apicoectomy) is a well-established microsurgical procedure typically indicated in cases of endodontic failure due to persistent periapical lesions, overfilling, instrument fracture, root perforations, or inaccessible anatomy. The technique involves resection of the apical 2–3 mm of the root, retrograde cavity preparation using ultrasonic tips, and sealing with biocompatible materials such as mineral trioxide aggregate (MTA), glass ionomer, or—historically—amalgam.^(1,2)

This procedure is considered the last option to preserve the affected tooth in the oral cavity.⁽³⁾ It is generally indicated in endodontic treatments that have failed, whether due to false canals, persistence of symptoms of active endodontic infection, persistence of apical lesions, apical overfilling, fracture of instruments within the root canal, or root perforations, among others.⁽⁴⁾

Its objective is to eliminate the causal factor responsible for the symptoms and/or associated signs, as well as to achieve disinfection and cleaning of the root canal system in endodontically treated teeth, thereby preventing reinfection of the tooth. This leads to healing of the periradicular bone, which is generally achieved through the removal of causal factors or irritating agents affecting the root.^(1,4)

Previous studies report that teeth treated with apical surgery show high long-term survival rates and a favorable prognosis.^(5,6,7,8) In Dentistry, as in any other branch of Medical Sciences, it is necessary to consider the particularities of each individual and to integrate other specialties into comprehensive treatment, such as Psychology and Medicine, in order to provide quality care and achieve successful management of failed endodontic therapy in young patients. For this reason, the present study was conducted, with the objective of presenting a case whose treatment was based on apicectomy and retrograde filling due to painful symptoms and paresthesia associated with the presence of a false canal.

CASE REPORT

A 15-year-old White female with no significant medical history presented with persistent pain and paresthesia in tooth #12, previously endodontically treated. Intraoral examination revealed slight discoloration of the crown and positive responses to both horizontal and vertical percussion.

An occlusal radiograph (used in lieu of periapical film due to local resource limitations) showed an unobturated main canal and a distinct false canal extending laterally from the root (Fig. 1), confirming endodontic failure.

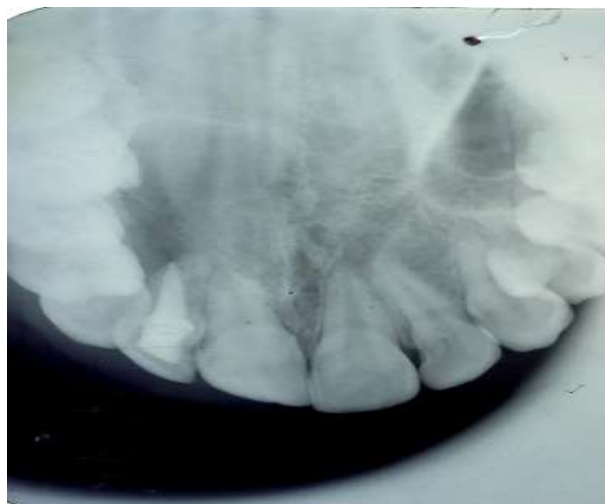


Fig. 1 Occlusal radiograph.

he health problem presented by the patient was explained to her legal guardians in order to provide them with a certain degree of understanding, which facilitated convincing the young patient to cooperate with the treatment. After obtaining informed consent, an individual Periodontology clinical record was prepared, a legal document that allowed the collection of all information regarding the patient's current health status and medical history.

Subsequently, it was decided to remove the canal filling, which was then refilled with calcium hydroxide, and finally a temporary restoration with zinc polycarboxylate was placed. Complementary examinations were indicated, and the conditions were established to perform open-field retreatment and apicectomy in the surgical unit. The evaluation of the complementary tests was within normal parameters.

Once in the operating room, anesthesia was administered with 2 % lidocaine and epinephrine. Ostectomy and apicectomy were performed, consisting of the removal (approximately 3 mm) of the most apical portion of the tooth, near the tip.

The temporary seal of tooth 12 and the calcium hydroxide were removed. Irrigation was carried out with 0,2 % chlorhexidine. The root canal was thoroughly dried with sterile paper points and refilled using gutta-percha cones and the lateral condensation technique. The retrograde cavity was then prepared (with an ultrasonic instrument). This cavity is created to be filled with a material that separates the tooth chamber from the periapical bone. The retrograde cavity was filled with a biocompatible material or cement, in this case amalgam (Fig. 2). Finally, suturing was performed (Fig. 3), and postoperative instructions were provided.



Fig. 2 Ostectomy, apicoectomy, canal retreatment, shaping and filling of the retrograde cavity.



Fig. 3 Suture.

Antibiotic therapy with Cephalexin (500 mg), one capsule every eight hours for seven days, was prescribed, and suture removal was scheduled seven days after surgery. In addition, clinical and radiographic examinations were indicated every three months to monitor the patient's progress, in which proper tissue repair and absence of associated symptoms were confirmed (Fig. 4).



Fig.4 Medical discharge.

The patient reported being satisfied with the treatment performed, both from an aesthetic perspective and in terms of psychological well-being. The prognosis for this lesion was favorable, since from the first postoperative check-up at seven days and throughout the clinical and radiographic examinations conducted during the 18 months following the intervention, no signs of pain, paresthesia, discoloration, or mobility of the tooth were observed. In addition, the patient was young, and her periapical tissues possessed all the necessary elements to produce an excellent vascular and cellular response, which allows the alveolar bone to have a high and positive reparative potential.

DISCUSSION

Dental care for patients under 18 in Cuba is delivered with special attention to developmental, psychological, and cooperative factors, often requiring extended consultation times and skilled personnel.^(8,9)

In the present work, we report the case of a 15-year-old female patient in whom a false canal was identified following endodontic treatment of an anterior tooth. The case was successfully managed surgically by the Periodontology specialty through apicectomy and open-field retreatment.

De la Rosa Ricardo et al.,⁽⁸⁾ in Cuba reported a similar case in a pediatric patient with traumatized maxillary central incisors and unresolved endodontic treatment, in which apicectomy and retrograde filling were performed with satisfactory results, using silver amalgam for apical sealing. In that case, it was necessary to continue reconstructive treatment of the right maxillary central incisor due to excessive loss of dental tissue in the crown caused by trauma.

Another similar case was reported in Brazil by Almeida Couto,⁽¹⁾ where apicectomy with retrograde filling was performed in a young female patient with failed prior endodontic treatment, showing a marked reduction in lesion size within four months.

Floratos,⁽¹⁰⁾ and Abedi,⁽¹¹⁾ in cases of apicectomy, root resection, and endodontic microsurgery, advocate for microsurgical endodontics due to significant advances achieved, with success rates reaching 92 %. This demonstrates that it is a predictable treatment method thanks to the dental surgical microscope, the use of ultrasonic tips for root-end preparation, and more biocompatible filling materials.

Conversely, Castro Calderón,⁽¹²⁾ demonstrated that in apicectomy cases, the horizontal incision along the sulcus line, although providing excellent field visibility, presents as its main disadvantage the possibility of gingival recession and bone resorption.

The difference between the present study and those previously cited,^(1,10,11) lies in having achieved treatment success despite limitations in diagnostic means, such as the radiographic view used, which was not the preferred choice due to the lack of periapical radiographic films. Likewise, resources such as the dental surgical microscope and certain dental materials were unavailable, in some cases obsolete, due to the economic embargo that has affected the Cuban health system for years.

Dental biomaterials have been specifically designed for use in dentistry with the purpose of restoring, replacing, or improving dental structures and adjacent tissues. Over the past five decades, significant advances have been made in this field, employing materials ranging from ceramics, glass, polymers, composites, glass-ceramics, metallic alloys such as amalgam, to the use of living cells and tissues.⁽¹⁾

Most of these materials are biocompatible, share low or no toxicity, and generally do not cause adverse reactions in the body. However, in the case of amalgam, since 2020 the American Dental Association has recommended avoiding its use due to reports related to insomnia, muscle weakness, dizziness, mood changes, headaches, and tremors strongly associated with mercury exposure, one of its components, in addition to the grayish appearance of teeth restored with this material and other environmental risks.^(13,14)

Despite the aforementioned considerations, composite fillings, which are the most widely used today and typically last up to 10 years, when compared with amalgam restorations, can last more than 30 years and even a lifetime, demonstrating high resistance and effectiveness. For these reasons, together with the existing economic limitations in Cuba, amalgam continues to be used with successful results.^(8,13,14)

In the present case, it had the added advantage of not affecting aesthetics with its typical grayish color, since it was placed as a sealer in the apical third of the tooth. Gabriel de Lima et al.⁽⁴⁾ reinforce the importance of periodontal surgery associated with apicectomy as a highly efficient technique in cases of failed conventional endodontic treatment. These authors emphasize that the results largely depend on the correct execution of the surgical technique, requiring professionals with the necessary knowledge and skills, in addition to the use of dental materials that ensure the best therapeutic outcomes.

CONCLUSION

Apicoectomy remains a highly effective salvage procedure for teeth compromised by false canals, especially when non-surgical retreatment is unfeasible. In adolescent patients, it not only preserves function and esthetics but also supports psychological integrity. Despite constraints in access to advanced diagnostics, microscopes, or modern biomaterials, skilled clinicians in low-resource settings can still achieve excellent outcomes through sound surgical principles and judicious material selection.

Conflict of interest

The authors declare that there is no conflict of interest.

Authors' contributions

DPA: conceptualization, research, supervision, and approval of the final version.

EPG: conceptualization, research, and approval of the final version.

YRG: research, methodology, data presentation, and approval of the final version.

ICG: research, critical review, and approval of the final version.

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