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ENDODONTIC RETREATMENT OF THE MANDIBULAR MOLAR WITH DIFFUSE PERIAPICAL BONE RADIOTRANSPARENCY IN A SINGLE SESSION

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ABSTRACT

The objective of this study was to describe a clinical case of endodontic retreatment in a single session in a tooth with chronic apical periodontitis. A 49-year-old patient reported during anamnesis pain during mastication and vertical percussion in the left mandibular first molar (36). Radiographically, the presence of obturator material below the appropriate apical limit (underfilling) and diffuse periapical bone radiotransparency were observed, suggesting a diagnosis of chronic periapical abscess. Root canal retreatment was proposed for the patient, and informed consent was obtained before the start of treatment. After anesthesia, coronary opening was performed and an appropriate form of convenience was performed. Gutta percha was removed with the Reciproc #R25 system. Foraminal electronic odontometry was performed with the Root Zx Mini Apex Locator (J. Morita Corp., USA). The irrigating substance used was 2.5% sodium hypochlorite. The filling of the root canal system was performed by the R#40 single cone technique and vertical condensation,

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associated with SealerPlus cement. Clinical and radiographic preservation performed 3 years after root canal filling determined the success of conservative endodontic retreatment, since the patient was asymptomatic and the radiographic examination demonstrated complete repair of the periapical lesion. It is concluded that endodontic retreatment in a single session determined the success of conservative endodontic therapy.

Keywords: Chronic apical periodontitis, Root canal retreatment, Conservation.

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INTRODUCTION

Most failures and failures of endodontic treatment are related to the persistence of microorganisms resistant to chemical-mechanical preparation and/or intracanal medication. Allied to this, the complexity of the root canal system, with the presence of isthmus, branches, indentations and tubules, is also an obstacle to correct cleaning and sanitation. In the search for more effective methods for disinfection of the root canal system, new techniques and new instrumentation systems have been introduced in endodontics. The Reciproc Blue® (RB) instrument was developed from an innovative heating process that modifies its molecular structure, increasing its flexibility and resistance to fatigue. When introduced into the root canal, it acquires the austenite shape and develops a movement of expansion and contraction during the rotational movement, making it possible to touch all the walls and agitate the irrigating solution. The present study aimed to evaluate the efficacy of the Reciproc Blue, XP-endo Shaper and XP-endo Finisher systems regarding the ability to reduce the bacterial load of root canals of human teeth, single-rooted and single-channeled, oval-shaped, with a diagnosis of pulp necrosis and asymptomatic apical periodontitis. The XP-S and RB systems markedly reduced the bacterial load in oval-shaped root canals. XP-F used as a supplementary instrument to chemical-mechanical preparation promoted a significantly greater bacterial reduction (Amaral, 2020).

Endodontic failures can be attributed through inadequate cleaning, biomechanical preparation and filling, iatrogenic events, or reinfection of the root canal system, when coronary sealing is lost after completion of endodontic treatment. As soon as it is possible to improve the quality of the chemical-mechanical preparation and filling of the anterior obturator material, the non-surgical approach should be considered as the main choice, as it is considered a more conservative approach, aiming to reestablish the repair of the periapical tissues. (Oliveira, et al. 2105). One of the critical aspects of endodontic retreatment that can directly influence the success of the procedure is the amount of gutta-percha and endodontic cement present in the root canals. Removing a substantial amount of this material is essential to facilitate subsequent thorough cleaning, precise reshaping, and proper refilling of the canal. In a dynamic field like endodontics, where research and innovations continue to shape clinical practices, the dedication to improving approaches. Retreatment is crucial to achieving the best outcomes for patients. The convergence of knowledge, technology, and clinical experience is the way to address the challenges inherent in endodontic retreatment and to continue to raise the standards of dental care

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(Travassos et al, 2023). The objective of this study was to describe a clinical case of endodontic retreatment in a single session in a tooth with chronic apical periodontitis.

METHODOLOGY

To build this case report, a methodology was created that aimed to obtain a range of information with the maximum content related to the theme addressed in the report, using works such as: doctoral and master's theses, course completion papers, case reports that address the same content, online books, monographs, PICs and review articles. Thus, to obtain this information, it is necessary to research the topic in reliable and well-founded sources, thus, searches were carried out in the following databases: BVS/BIREME, PUBMED Central, Web of Science, DeCs, Science Direct, Scielo, PROSPERO, CAPES Journal Portal, FT Magazine, The Cochrane Library, LUMEN ET VIRTUS Journal, Research, society and development journal and Google Academy. To build this case report, gray literature was also used, aiming to enrich the case report with proven scientific basis, information that is reliable and safe to compose the work. As it is a case report article, it was necessary to use the work and research protocol of Yin (2001) together with the study of Pereira (2018), using both to develop the methodology used in the construction of this case report, also using it to structure it, in addition to indicating how the approach used within a case report should be. During the search for the information used in the composition of this report, aiming to acquire only the content that is necessary and that does justice to the theme addressed, the following descriptors were used during the searches: Root canal treatment; Intracanal medication; Periapical lesion; Endodontics.

RESULTS

A 49-year-old patient reported during anamnesis pain during mastication and vertical percussion in the left mandibular first molar (36). Radiographically, the presence of obturator material below the appropriate apical limit (sub-filling) and diffuse periapical bone radiotransparency were observed, suggesting a diagnosis of chronic periapical abscess (Figure 1).

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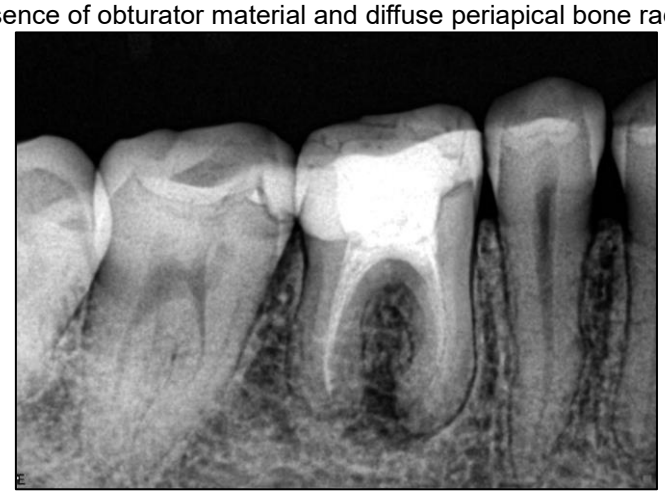
Figure 1 – Presence of obturator material and diffuse periapical bone radiotransparency



Root canal retreatment was proposed for the patient, and informed consent was obtained before the start of treatment. After anesthesia, coronary opening was performed and an appropriate form of convenience was performed. Gutta percha was removed with the Reciproc #R25 system. Foraminal electronic odontometry was performed with the Root Zx Mini Apex Locator (J. Morita Corp., USA). The irrigating substance used was 2.5% sodium hypochlorite. Foraminal debridement was performed with a Prodesign Logic 25.01 System instrument at the actual length of the tooth. Subsequently, the root canals were prepared with the Reciproc R40 (VDW) reciprocating system at the actual working length.

Subsequently, the irrigation protocol activated with the Easy Clean plastic file (Easy Equipamentos Odontológicos, Belo Horizonte, Brazil) was instituted, as follows: 3 cycles of 20 seconds of 2.5% Sodium Hypochlorite (NaOCl) followed by 3 cycles of 20 seconds of 17% EDTA (Biodinâmica, Ibiporã, Brazil), finished with 3 cycles of 20 seconds of 2.5% NaOCl. The root canal system was filled using the R#40 single-cone technique and vertical condensation, associated with SealerPlus cement (MKLife) (Figure 2). Definitive restoration was performed in a subsequent session with composite resin (Z2503M ESPE, St. Paul, MN, USA). Due to the wear and tear of the walls of the pulp chamber, it was informed that the patient would need a single fixed prosthesis.

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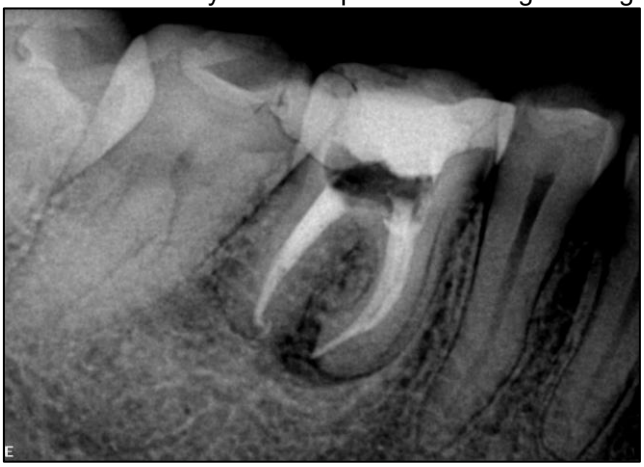
Figure 2 - Filling of the root canal system was performed using the single cone technique



Clinical and radiographic preservation performed 3 years after root canal obturation determined the success of conservative endodontic retreatment, since the patient was asymptomatic and the radiographic examination demonstrated complete repair of the periapical lesion (Figure 3).

Figure 3 – 3-year preservation with complete repair of the periapical lesion.

DISCUSSION

Persistence of infection after primary endodontic treatment occurs with common frequency. In the presence of extensive lesions, it can generate large bone resorptions and be accompanied by signs and/or symptoms. There is a greater degree of contamination inside the root canal, but the periradicular region can also be affected by these microorganisms. When a favorable decrease in the microbial load in the canal and periapical region is not obtained, it is necessary to intervene again, through endodontic retreatment, with a view to complete bone repair. In this case, the retreatment consisted of

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removing the previously existing filling material from the infected root canal, for subsequent instrumentation, sanitation and filling of the root canals. However, in cases of extensive lesions, even in the face of an adequate decontamination protocol, with successive changes of intracanal medication, complete repair of the periapical region may not occur, with the persistence of signs and symptoms of infection, determining the need for surgical complementation.

Endodontic retreatment aims to remove all previously existing filling material and an effective reinstrumentation of the dentin walls of the root canal, to obtain an adequate form (cleaning and modeling) that favors the new filling. After emptying and determining the working length and patency, the instrumentation of the root canals begins. However, emptying and reinstrumentation, in most cases, are performed concomitantly. Clinically, reinstrumentation is considered complete when there is no further evidence of gutta-percha or sealer in the endodontic instrument, the excised dentin shavings are light in color, and the root canal, through tactile sensitivity, has smooth walls and, imaginarily, an adequate shape that allows its subsequent filling effectively. In search of these fundamentals, several maneuvers have been suggested: manual and special; with instruments of variable conicity.

The success of endodontic treatment is characterized by the absence of painful symptoms, fistula, edema, apical lesion or periodontal impairment, and to obtain it it is necessary to respect endodontic techniques. It was observed that the main causes of failures are: unsatisfactory disinfection, lack of canal location, fracture of instruments, trepannation, extravasation of filling material, absence of coronary sealing, infiltration in the coronary restoration and the persistence of some microorganisms, with Enterococcus Faecalis being the most frequent species found and consequently the most difficult to be eliminated. Thus, iatrogenic errors in line with microbiological influence are the factors that lead to failure and subsequent endodontic retreatment. (Matos, 2021). Corroborating these findings (Luckmann et al. 2013) found that a number of factors can contribute to the failure of endodontic treatment, such as: inadequate instrumentation, accidents and complications occurring during treatment, presence of bacterial biofilm, inadequate filling and sealing of root canal systems, use of irritating materials to periapical tissues, and deficient coronary restorations.

A long-term pulp infection allows bacteria to propagate to the entire root canal system, in addition to the root canal lumen and dentin tubules, the lateral, secondary, and accessory canals; apical delta; gaps formed by cementary resorptions protected by

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bacterial biofilm and the periapical region. This information emphasizes the need for bacterial elimination of the canal system, which is not achieved in cases of teeth with long-term periapical lesions, only with biomechanical preparation, as it would be impossible to eradicate the entire infection without the complementary help of a topical medication between sessions (Travassos et al, 2022). In the present case report, endodontic retreatment was the first treatment option in the face of persistent infection. Treatment should follow an appropriate clinical decontamination protocol, in order to cure the patient's signs and symptoms, with regression of periapical lesions (Regezi, Sciubba, 2020). To remedy the infectious process associated with the root canal and the periapical region, it is necessary to reduce the bacterial microbiota in these places as much as possible. Thus, the use of a powerful irrigating solution with antimicrobial properties is recommended. Sodium hypochlorite is recommended as the main irrigant, since it has a broad spectrum of action and tissue dissolution capacity. In addition to these favorable properties, the activation of the irrigating solution enhances the decontamination process of the root canal system. In this case, the Easy Clean plastic instrument was used, which has the function of performing the physical agitation of the irrigator, with greater penetrability in lateral channels, isthmus and existing branches, maximizing cleaning and decontamination

Proper canal filling has a profound impact on the effectiveness of endodontic therapy. This filling must be performed precisely, in order to hermetically seal the root canal, preventing the entry of microorganisms. However, its importance goes beyond that. An adequate filling is also able to promote an environment conducive to tissue repair in the periapical region, allowing tissues to restore themselves naturally and preventing the recurrence of infections (Travassos et al., 2023). As reported in the present case, conventional endodontic retreatment was successful and sufficient to eliminate the infectious processes of the root canal system, allowing periapical bone neoformation, through effective cleaning and disinfection, and filling with good apical sealing. In addition, it is extremely important to preserve the patient in order to evaluate the evolution of the periapical lesion regression process in order to establish the success of endodontic treatment. From the clinical and radiographic follow-up, remission of the lesion and success in endodontic treatment were found (Alves, 2024).

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CONCLUSION

It is concluded that endodontic retreatment in a single session determined the success of conservative endodontic therapy.

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