LUMEN ET VIRTUS

Regression of periapical lesion after non-surgical treatment – Case report

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ABSTRACT

The present study aims to present the clinical case report regarding non-surgical endodontic treatment performed on tooth 22, with diffuse periapical lesion, suggesting chronic dento-alveolar abscess. The methodology consists of an individual descriptive study of the case report type, which includes radiographic images of a 23-year-old female patient. Clinically, in addition to swelling, it was found that there was mobility, absence of pain in the thermal test (cold) and on palpation. After a complete clinical examination, endodontic treatment, coronary opening, root canal exploration, and root canal preparation were initiated using the modified Oregon crown-apex preparation technique, associated with 2.5% sodium hypochlorite as an irrigating solution. Calcium hydroxide paste was applied as an intracanal medication for a period of 30 days and the coronary access was sealed with

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glass ionomer. In the following session, after verifying the absence of clinical signs and symptoms, it was decided to fill the root canal using the Tagger's Hybrid technique associated with gutta-percha and AH Plus endodontic cement. After the 24-month preservation period, tissue repair and bone neoformation of the area were observed, as well as the absence of clinical signs.

Keywords: Apical periodontitis, Root canal preparation, Calcium hydroxide.

INTRODUCTION

Apical periodontitis can be defined as a pathological process, acute or chronic, that occurs in the periapical tissues as a result of an infection in the root canal system after necrosis of the pulp tissue. Although there are physical and chemical factors involved, microorganisms are essential for the progression and perpetuation of the pathological process1 . This persistence can induce an inflammatory process and immune response in the periapical tissues, resulting in local bone destruction, thus affecting the tissue repair process. Oliveira et al., 2018

Endodontic treatment aims to promote an adequate environment so that the body can obtain the repair of the periapical tissues after the therapeutic intervention and, with this, the tooth can return to its normal functions. To achieve this goal, it is necessary to establish cleaning and modeling in order to disinfect the root canal systems, filling, and coronary sealing (Barbosa-Ribeiro et al., 2021). The indicated treatment is the decontamination of the root canal system through the use of chemical substances, preparation and modeling of the root canal and mechanical activation, in order to remove the necrotic pulp tissue and also by the insertion of intracanal medication.

After the reduction of regional inflammation, there is a stoppage in the growth of the lesion, then the repair process begins, with new bone formation and disappearance of clinical signs. Periapical repair is an important indicator of the success of endodontic treatment, which is monitored by means of clinical and radiographic examination. To evaluate the success of an endodontic treatment, it is necessary to perform a clinical and radiographic control of the patient, where the following criteria are evaluated: pain, odor, edema, fistula, presence or absence of periapical lesion. If all stages of endodontic treatment are carried out properly, it is expected that after the 1-2 year evaluation period, success will be achieved (Patriota et al., 2020).

Adequate follow-up of the therapeutic approach, the initial radiographic record, the immediate aspect and the final aspect through these radiographic records are indispensable. The case discussed above in this monograph addresses the treatment of a persistent periapical lesion through conventional non-surgical endodontic retreatment associated with intracanal medication based on calcium hydroxide . The professional has longitudinal control as resources, based solely on clinical characteristics (signs and symptoms) and radiographic aspects. The results of root canal treatment have been evaluated in several epidemiological studies, either through cross-sectional studies or longitudinal studies. (Travassos, et al. 2021). Success is dependent on several preoperative factors, as well as on the results of root canal preparation and filling, and on occasional setbacks in treatment. It seems that teeth treated with vital pulps have a better prognosis than those with necrotic pulps The authors also state that for the correct follow-up of the therapeutic approach, the initial radiographic record, the immediate aspect and the final appearance through these records are of fundamental importance.

The objective of this study is to analyze the process of periapical tissue repair, through a clinical case, after non-surgical endodontic treatment.

CASE REPORT

The proposed treatment was the conventional endodontic performed by the modified Oregon crown-apex preparation technique associated with 2.5% sodium hypochlorite as an irrigating solution, calcium hydroxide paste as intracanal medication between sessions and root canal filling by the Tagger's Hybrid technique associated with gutta-percha (Odous De Deus) and AH Plus endodontic cement (Dentsply).

Treatment was initiated with infiltrative anesthesia and paraperiosteal of the region with 4% Articaine 1:100,000 (DFL, Rio de Janeiro/RJ), absolute isolation with a rubber sheet (Madeitex, São José dos Campos/SP), use of staple 00 (SS White – Duflex, Rio de Janeiro/RJ) on tooth 41 and sealing with a gingival barrier Gingi Dam (Villevie, Joinville/SC). The coronary accesses were performed with a 1012 spherical diamond tip (AllPrime, São José/SC) and the convenient form of access and compensatory wear with the aid of 3082 diamond tips (AllPrime, São José/SC). The initial exploration was performed with a C Pilot #15 file (VDW, Germany), followed by cervical and middle preparation with the Orifice Shapper #17.08 file (MK Life, Porto Alegre/RS). Odontometry was performed with an electronic foraminal locator (Root ZX Mini – J. Morita, Japan)

Apical preparation was completed until file 45.02 and foraminal cleaning was performed with files 20.02. Next, the irrigation protocol with 2.5% sodium hypochlorite and EDTA was carried out under mechanical agitation at low speed with EasyClean® (Easy Equipamentos Odontológicos, Belo Horizonte, MG, Brazil) with three cycles of 20 seconds each, in the following order: 1st cycle with 2.5% sodium hypochlorite, 2nd cycle with EDTA and 3rd cycle with 2.5% sodium hypochlorite. Active mechanical irrigation is clinically efficient in distributing the irrigant up to the working length, ensuring the cleaning of the canal and branches. Then the root canal was dried with absorbent paper cones and intracanal medication based on calcium hydroxide (UltraCal XS®, Ultradent, Indaiatuba, SP, Brazil) was applied for a period of 30 days and provisionally sealed with glass ionomede. After this time, and after the removal of the intracanal dressing, it was decided to fill the root canal using the modified Tagger's Hybrid technique associated with AH Plus endodontic cement (Dentsply). Figure -1. The definitive restoration was performed in the same session with composite resin, sealing the coronary access, avoiding recontamination. After one year, clinical and radiographic preservation showed the process of periapical tissue repair. Figure -2.

Figure -1 - Root canal filling



Figure -2 – Preservation after one year



DISCUSSION

Persistence of infection after primary endodontic treatment occurs with common frequency. For Travassos et al (2021), the adequate follow-up of the therapeutic conduct, the initial radiographic record, the immediate aspect and the final appearance through these radiographic records is indispensable. 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, bone repair should be awaited. Corroborating the findings of Travassos et al, 2024, who state that when there is a regression of more than half of the lesion, it can be inferred quite appropriately that sanitation of the root canal system was well executed. Travassos, et al. 2024.

A long-term pulp infection allows bacteria to propagate to the entire root canal system, in addition to the lumen of the root canal and dentin tubules, the lateral, secondary, and accessory canals; apical delta; gaps formed by the cementary resorptions protected by 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). As already mentioned, not all cases presented in dental practice presented a favorable prognosis. This prognosis may be questionable or unfavorable due to the presence of a long-standing infection, the inability to reach microorganisms in inaccessible areas (i.e., complex apical anatomy or the existence of extraradicular infection), the presence of large apical cysts, or, in some cases, decreased immunocompetence of the patient. This last variable encompasses genetic or acquired predisposition to develop apical periodontitis (Travassos et. al. 2024).

Sodium hypochlorite (NaOCl) is the most commonly used auxiliary chemical in the endodontic treatment of teeth with pulp necrosis, in concentrations ranging from 0.5% to 5.25%. This substance has rapid and pronounced antibacterial activity against a wide range of microorganisms, including bacteria commonly isolated from endodontic infections (Louzada et al., 2020). Irrigating solutions and intra-canal medications offer important conditions capable of altering the microbiota located in the root canal. However, due to the diffusion of endodontic infection, it is believed that biomechanical preparation and bactericidal irrigating solutions are not yet sufficient to achieve complete disinfection of the root canal system, which is why some authors indicate treatment in some sessions with intra-canal medication between them (Aveiro et al., 2020; Menezes et al., 2021).

Treatment must 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. In addition to the irrigation protocol, intracanal medication (Ultracal) was also used. This medication has excellent biological, biocompatibility and bioactivity properties, allowing the repair of connective tissue and inducing bone repair. Intracanal medication based on calcium hydroxide helps in the tissue repair process, this is due to the dissociation of calcium and hydroxyl ions, leading to an elevation of pH. The anti-inflammatory, antimicrobial and biocompatibility action

of this medication are essential for the repair of the lesion. the permanence at the application site. It also has the ability to convert calcium oxide into calcium hydroxide in the presence of moisture. This conversion causes the pH to rise, resulting in beneficial antibacterial effects.

Proper root 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. An adequate filling is also able to promote an environment conducive to tissue repair in the periapical region, allowing tissues to restore naturally and preventing the recurrence of infections (Travassos *et al.,* 2022).

CONCLUSION

It is concluded that endodontic treatment associated with intracanal medication renewal determines the clinical and radiographic success of periapical bone radiotransparency.

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