LUMEN ET VIRTUS

Regression of periapical and lateral lesion of the lower molar involving the alveola bone crest - Case report

https://doi.org/10.56238/levv15n39-043

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ABSTRACT

The present study aims to present the clinical case report regarding non-surgical endodontic treatment performed on tooth 37, with a circumscribed periapical lesion, suggesting a phoenix abscess. The methodology consists of an individual descriptive case report study, which includes radiographic images of a 15-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 preparation technique with reciprocating instruments 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 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 single cone technique associated with AH Plus endodontic cement. After the five-month preservation period, tissue repair and bone neoformation of the area and absence of clinical signs were observed.

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 in it, microorganisms are essential for the progression and perpetuation of the pathological process. 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. 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).

A successful endodontic treatment or retreatment depends on the combination of three factors: adequate instrumentation, irrigation and filling of the canal systems, of these three phases irrigation is the most significant determinant for a good healing of pulpo-periapical pathologies. This is due to the property of the irrigant removing the remains of necrotic tissue disinfect the canals, contributing to the elimination or reduction of bacteria, especially for those teeth of complex anatomy (Prada, 2019).

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 bacterial biofilm and the periapical region. This information emphasizes the need for bacterial elimination from 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)

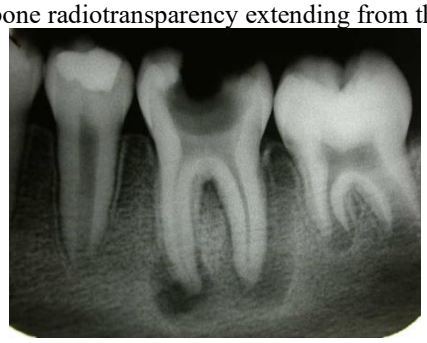
The present study reports a case of strictly endodontic lesion, although it presents characteristics similar to an endospinal lesion, since endodontic therapy alone was effective in eliminating clinical symptoms, and the radiographic examination of the case in a 5-month preservation period showed a significant reduction in periapical and lateral bone radiotransparency.

CASE REPORT

Patient R.S.A., 11 years old, presented at the Endodontics clinic of FOP/UPE, reporting that he had been referred by the Pediatric Dentistry clinic of the same institution, where he was treated urgently 07 days earlier, due to an edema located in the region of the left mandible angle and intense and spontaneous painful symptoms, having been diagnosed as a phoenix abscess, due to the fact that he presented a diffuse periapical lesion. When he was seen at the endodontics clinic, the clinical examination revealed an area of hyperemia and edema in the marginal gingiva, with no visible fistula, negative response to the vitality test, and no mobility or periodontal pocket on probing.

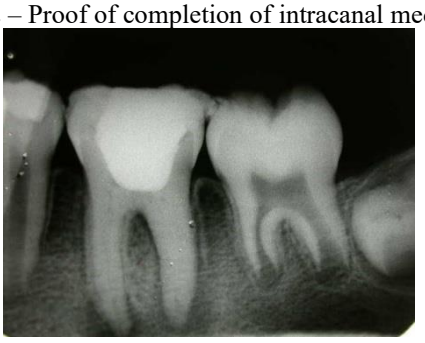
Radiographic examination showed periapical and lateral bone radiotransparency extending from the apex to the alveolar bone crest. (Figure 1).

Figure 1 - Periapical and lateral bone radiotransparency extending from the apex to the alveolar bone crest.



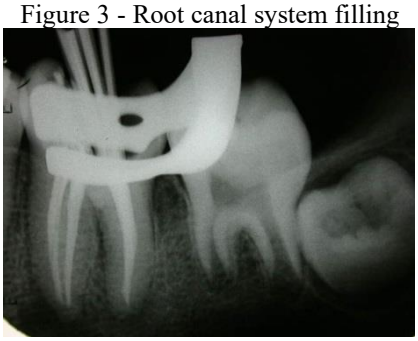
Although the clinical and radiographic characteristics suggest a lesion of endodontic and periodontal involvement, the preservation of the bone structure of the marginal crests and a level of rarefaction compatible with that induced by drainage via the periodontal groove of the periapical lesions was observed, and therefore, the lesion was diagnosed as strictly endodontic. After the antisepsis procedures, anesthesia of the inferior alveolar nerve was performed, followed by absolute isolation and removal of the decayed tissue with a spherical drill No. 2 (KG Sorensen, Cotia-SP, Brazil) at high rotation, followed by coronary opening of element 37 and drainage of the purulent collection via canal. Subsequently, it was irrigated with a 2.5% sodium hypochlorite solution and the canal was explored with a K#15 instrument (Dentsply-Meillefer). Odontometry was performed with a K-Flexofile manual file number 25. The preparation of the root canals was performed with reciprocating files Reciproc R 25 in the mesial canals and R40 in the distal canals. UltraCal® XS (calcium hydroxide-based paste) was used as an intracanal medication for 30 days. In (Figure 2), the periapical X-ray showed complete filling of the calcium hydroxide paste

Figure 2 – Proof of completion of intracanal medication



The filling of the root canal system was performed using the single-cone technique associated with AH-Plus cement. (Figure 3).

Figure 3 - Root canal system filling



The clinical and radiographic follow-up performed 5 months after the conclusion of the treatment in the preservation consultation determined that the lesion regressed satisfactorily. (Figure 4).

Figure 4 - Clinical and radiographic control performed 5 months after the conclusion of treatment



DISCUSSION

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. An accurate diagnosis, associated with appropriate endodontic treatment, can avoid unnecessary surgical intervention and enable a high chance of a favorable prognosis in the long term. (Oliveira et al, 2018). For Travassos et al (2021), the adequate follow-up of the therapeutic conduct, the initial radiographic record, the immediate aspect and the final aspect through these radiographic records is indispensable. The objective of this study was to verify the process of periapical tissue repair, through a clinical case, after non-surgical endodontic treatment.

The fundamental biological reasoning to achieve the success of endodontic treatment basically consists of eliminating microorganisms from the root canal system as much as possible, creating a favorable environment for repair. Two approaches have been proposed to address this problem. In one approach, residual bacteria are eliminated or prevented from recolonizing the root

canals through the use of an intracanal medication. The other approach is to eliminate the remaining bacteria or render them harmless by burial after a three-dimensional airtight filling, to deprive the microorganisms of their nutrition and the space they need to survive and multiply.

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, Ultracal intracanal medication was also used, with monthly renewal for a period of 6 months. This medication has excellent biological, biocompatibility and bioactivity properties, allowing the repair of connective tissue and inducing bone repair.

Calcium hydroxide paste was the intracanal medication of choice, in line with the recommendations of Pieper, Münchow (2015), who stated that its excellent antimicrobial properties, for several days or weeks within the root canal system, can increase the radius of action of the paste, reaching microorganisms located deeper in the root canals, thus favoring apical repair.

Endodontic therapy should always be performed seeking the prevention or repair of periapical lesions, regardless of their nature or extent. Thus, the professional must act in order to ensure the highest level of disinfection of the root canal system and, for this, he finds as an ally, in addition to the irrigating substance, intracanal medications, including calcium hydroxide and its associations. Several studies support the importance of this medication in the repair of lesions such as those exemplified in the present case report due to its high alkalinity characteristic and its potential to induce hard tissue formation. However, it is worth noting that it is essential to follow up the patient in order to establish the evolution of lesion regression in order to determine the success of endodontic treatment. (Nascimento et al. 2021).

Medication changes are recommended until the desired result is obtained. The use of intracanal medication as an aid in postoperative control is relevant during endodontic treatment, since mechanical chemical preparation does not remove all microorganisms present, due to the complexity of the root canal system, with apical deltas, lateral canals, accessories, and also the dentin tubules (Pacios, 2012).

The determination of the quality of endodontic treatment is carried out through clinical examination, radiographic examination and histopathological analysis. The professional has longitudinal control as resources, based solely on clinical characteristics (signs and symptoms) and radiographic aspects. (Travassos et al. 2024). It is considered necessary for the operator to have scientific knowledge and manual skill to perform the necessary operative steps that have a higher

learning curve. Factors such as a good prognosis, longevity of the treatment and, above all, the health and function of the tooth in question must be achieved. In this same context, all therapy should be evaluated in its preservation, for final confirmation of success in endodontic treatment. Therefore, it is important to emphasize that endodontic treatment does not end with its filling, but after the minimum period of preservation that varies from 6 to 12 months. (Travassos et al. 2023).

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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