

REPAIR OF PERIAPICAL LESION OF LOWER INCISORS
AND CANINES AFTER 4 MONTHS OF PROSERVATION

Reparo de lesão periapical de incisivos e canino inferiores após 4 meses de proservação

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ABSTRACT

The clinical examination yielded a diagnosis of chronic apical periodontitis, which was determined to be the result of traumatic occlusion. The vitality test (C-Pulse Pulp Tester Digital Vitalometer, Coxo, China) showed a negative response. In the periapical radiological examination, a significant radiolucent area was identified in the apical regions of teeth # 33. The treatment plan involved root canal therapy. Root canal preparation was carried out using Ni-Ti rotary instruments Solla Collors following the crown-down preparation method. The canals were irrigated with a combination of 2,5% sodium hypochlorite. This entire process of instrumenting and enlarging the root canals aimed to ensure that all canals reached size 50.04. The canals were filled with gutta-percha using the single cone technique. In addition, the access cavity was sealed with glass ionomer cement (GC-Fuji IX Japan). A final digital periapical radiograph (PA) was obtained to confirm proper obturation. It is concluded that non-surgical root canal treatment represents the optimal initial treatment for teeth exhibiting a large periapical lesion. Healing was observed in the periapical region during the controls performed at four and 4 months.

Keywords: Periapical lesion, non-surgical endodontic treatment, periapical healing.

RESUMO

O exame clínico revelou o diagnóstico de periodontite apical crônica, que foi determinada como resultado de oclusão traumática. O teste de vitalidade (C-Pulse Pulp Tester Digital Vitalometer, Coxo, China) apresentou resposta negativa. No exame radiológico periapical, foi identificada uma área radiolúcida significativa nas regiões apicais do dente nº 33. O plano de tratamento envolveu terapia de canal radicular. O preparo do canal radicular foi realizado com instrumentos rotatórios de Ni-Ti Solla Collors, seguindo o método de preparo coroa-baixo. Os canais foram irrigados com uma combinação de hipoclorito de sódio a 2,5%. Todo esse processo de instrumentação e alargamento dos canais radiculares teve como objetivo garantir que todos os canais atingissem o tamanho 50,04. Os canais foram obturados com guta-percha utilizando a técnica de cone único. Além disso, a cavidade de acesso foi selada com cimento de ionômero de vidro (GC-Fuji IX Japão). Uma radiografia periapical digital (PA) final foi obtida para confirmar a obturação adequada. Conclui-se que o tratamento endodôntico não cirúrgico representa o tratamento inicial ideal para dentes com lesão periapical extensa. A cicatrização foi observada na região periapical durante os controles realizados aos quatro e quatro meses.

Palavras-chave: Lesão periapical, tratamento endodôntico não cirúrgico, cicatrização periapical.

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INTRODUCTION

The range of treatment options for large periapical lesions comprises non-surgical root canal therapy and/or apical surgery, in addition to extraction. However, in line with minimally invasive endodontics, most inflammatory periapical lesions are effectively treated with non-surgical endodontic therapy. The objective of this methodology is to eliminate or reduce the bacterial load within the root canal system, thus establishing an optimal biological milieu conducive to the resolution of periapical lesions¹.

The treatment prognosis of periapical lesions is correlated with the success of root canal treatment and evaluated with radiographic controls. The same size of the lesion or its reduction in size on the radiographs taken suggests that the treatment was successful. Periapical lesions have been classified in many ways according to their clinical, histopathological, and radiographic features².

Periapical lesions develop as a result of microorganisms from necrotic pulp tissue or retained foreign bodies in the periapical tissue, leading to acute or chronic inflammation. It has been proven that the majority of inflammatory periapical lesions can be effectively treated using nonsurgical endodontic management. However, the selection between surgical and nonsurgical endodontic treatment for managing large periapical lesions remains a controversial issue³.

As a result, it is thought that the treatment of large periapical lesions can be successful without a surgical approach by removing the infected materials in the root canal with biomechanical and Chemical preparation, providing effective disinfection and achieving complete apical sealing with root canal filling⁴.

Most of periapical lesions usually result from microbial infection with oral microorganisms originating from the degenerated pulp tissue. These lesions are commonly painless and incidentally found on routine radiographic examinations. Treating these cases using non-surgical root canal is the fruit of the innovative techniques, tools and root medicaments as well as the tendency toward minimally invasive treatment. The healing process of the infected area is conditioned by a proper diagnosis, a treatment that follows good clinical practice under aseptic environment including cleaning, shaping and root filing³. The aim of the present clinical case report was to report non-surgical healing of a periapical lesion of endodontic origin associated with canino inferiro esquerdo, observed over a period of 4 months.

Case report

This report aims to reveal the effectiveness of nonsurgical, minimally invasive endodontic treatment for large periapical lesions. The clinical examination yielded a diagnosis of chronic apical periodontitis, which was determined to be the result of traumatic occlusion. The vitality test (C-Pulse Pulp Tester Digital Vitalometer,

Coxo, China) showed a negative response. In the periapical radiological examination, a significant

radiolucent area was identified in the apical regions of teeth # 33 (Figure 1).



Figure 1 - Radiolucent area was identified in the apical regions of teeth # 33

Informed consent was obtained from patients after discussing the treatment plan and long-term prognosis. The treatment plan involved root canal therapy. Following administration of local anesthesia (1:80000) and rubber dam placement, access cavity preparation was performed. An electronic apex locator (Dentsply Maillefer, Ballaigues, Switzerland) and a # 15 K-file (Mani, Tochigi, Japan) were used to determine working lengths. Root canal preparation was carried out until the canal reached a #20 size, with each K-file advanced 2 mm above the apical foramen.

Root canal preparation was carried out using Ni-Ti rotary instruments Solla Collors following the crown-down preparation method. The canals were irrigated with a combination of 2,5% sodium hypochlorite. This entire process of instrumenting and enlarging the root canals aimed to ensure that all canals reached size 50.04.

The canals were filled with gutta-percha using the single cone technique. In addition, the access cavity was sealed with glass ionomer cement (GC-Fuji IX Japan). A final digital periapical radiograph (PA) was obtained to confirm proper obturation. (Figure 2).



Figure 2 - A final digital periapical radiograph (PA) was obtained to confirm proper obturation

The success of treatment hinges on thorough clinical evaluations and radiographic imaging results. At the 4-month follow-up, the determination of early treatment success relies on both clinical evaluations and lesion volume changes, and the radiographs showed signs of healing (Figure 3).



Figure 3 -Lesion volume changes, and the radiographs showed signs of healing.

DISCUSSION

This case report highlights the successful management and healing of a large periapical lesion in the root canal therapy and adjunctive procedures. Clinicians should consider thorough disinfection of the root canal system and appropriate follow-up to assess the healing of periapical lesions.

The choice between endodontic treatment and periapical surgery for large periapical lesions has been a topic of debate in clinical practice for many years. The advancement of materials and techniques of endodontic treatment resulted in more teeth preservation and minimize the need for surgical intervention. Although many large lesions are treated by surgery, non-surgical root canal treatment is an alternative option. Therefore, the teeth with large periapical lesions verified radiographically were enrolled and a decision was taken to proceed with a root canal treatment⁴.

The current approach for the treatment of teeth with large periapical lesions is to first perform nonsurgical endodontic treatment. It has been stated that eliminating irritants within the root canal has a stimulating effect on the immune system, which accelerates periapical healing. When root canal treatment is insufficient, an apical surgical procedure may be performed. In the literature, there are many cases where non-surgical endodontic treatment applied to large lesions has yielded successful results. In this case, in line with the supporting literature, a non-surgical endodontic treatment option was

chosen. The majority of traumatic dental injuries involve the anterior teeth^{6,7}.

The success of endodontic treatment is evaluated depending on the asymptomatic teeth and mucosa in the posttreatment clinical examination, the healing of the periapical lesion with the formation of a trabecular structure, increasing density, and the functional use of the tooth. In many case series, periapical healing is determined by evaluating changes in the PAI index, which is determined to provide standardization^{8,9}. Healing was observed in the periapical region during the controls performed at four and 16 months. The teeth with a large periapical lesion demonstrated favourable outcomes at the conclusion of the follow-up periods. Non-surgical root canal treatment represents the optimal initial treatment for teeth exhibiting a large periapical lesion⁴. Periapical lesions are the result of microbial activity originating from necrotic pulp tissue or the presence of foreign bodies within the periapical tissue. In the presence of bacteria and their by-products, the periapical tissues start an immunological response, which ultimately leads to the development of periapical lesions¹⁷.

Periapical lesions occur following the inflammation in the defense system of the periapical tissues, caused by intracanal infection after apical periodontitis, trauma, and inadequate root canal treatment. In the treatment of teeth with periapical lesions, surgical methods such as apical resection, as well as root canal treatment and non-surgical methods, are applied. In recent years,

conservative treatment options have come before surgical interventions in the treatment procedures of teeth with periapical lesions¹². In the non-surgical treatment of periapical lesions, it is stated that such lesions are healed by eliminating the existing infection in the root canals¹⁰. Nonsurgical and surgical endodontic treatments have a high success rate in the treatment and prevention of apical periodontitis when carried out according to standard and accepted clinical principles. Nevertheless, endodontic periapical lesions remain in some cases, and further treatment should be considered when apical periodontitis persists. Although several treatment modalities have been proposed for endodontically treated teeth with persistent apical periodontitis, there is a need for less invasive methods with more predictable outcomes. The advantages and shortcomings of existing approaches for the diagnosis and treatment of endodontic periradicular lesions¹¹.

In this situation, bioceramics were utilized as a sealer, which exhibits excellent biocompatibility features due to their similarities to the biological process of hydroxyapatite production and the capacity to promote a regeneration response. They show osteoinductive capacity as they absorb osteoinductive compounds when in contact with the bone healing process¹². The advantages of less intrusive nonsurgical treatment for massive periapical lesions include less psychological impact and are more suitable for patients. It appears that the periapical lesion was totally healed owing to a suficiente blood

supply, abundant undifferentiated cells, and drainage via the lymphatic system. Thus, the lesion was cured to remove the causative causes by endodontic treatment and the regenerating capability of peri apical tissues¹³.

In periapical lesion healing, the protocols applied at each stage of the treatment are of particular importance. The treatment of four cases consisting of mandibular and maxillary incisors, molars, and premolars with a lesion was achieved by opening the correct access cavity, drainage, chemomechanical preparation, irrigation activation, intracanal medicament with $\text{Ca}(\text{OH})_2$, and filling the root canals with canal sealer and gutta-percha. After all these procedures, it was observed that the periapical lesions healed. Therefore, it should not be forgotten that non-surgical root canal treatment is a viable treatment choice in the treatment of teeth with periapical lesions¹⁴. Complete healing was achieved after two years, demonstrating that even extensive periapical lesions can be effectively treated with non-surgical endodontic retreatment, avoiding invasive surgical intervention¹⁵. the present case, radiographs showed that the radiolucent area was absent and that trabecular bone was forming. Clinical examination showed no sensitivity to percussion or palpation and the soft tissues were healthy.

In certain clinical situations, root canal treatment in teeth with apical periodontitis is performed in multiple visits, with the use of intracanal dressing between visits, aiming to reduce microorganisms and their by-products of

the root canal system prior to filling. However, in recent years, discussions have been growing about the real need for the use of intracanal dressing in these cases. The use of ultrasonic activation of the auxiliary chemical substance has increased the potential for decontamination promoted during the chemomechanical preparation of the root canal¹⁶. In this case, root canal treatment was performed in a single session.

The successful results demonstrated the efficacy of nonsurgical endodontic management, which is a minimally invasive approach when addressing large inflammatory periapical lesions with diverse causes.

CONCLUSION

It is concluded that non-surgical root canal treatment represents the optimal initial treatment for teeth exhibiting a large periapical lesion. Healing was observed in the periapical region during the controls performed at four and 4 months.

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Observação: os/(as) autores/(as) declaram não existir conflitos de interesses de qualquer natureza.