

PERIAPICAL SURGERY WITH TRANSURGICAL FILLING OF A TOOTH WITH EXTENSIVE PERIAPICAL LESION: CASE REPORT

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ABSTRACT: This paper aims to describe a case of endodontic treatment associated with surgical treatment with apical curettage, apicectomy and transsurgical filling of a right upper lateral incisor with extensive periapical lesion. The patient attended the dental office reporting pain, facial swelling and fever. On clinical examination, an increase in extra and intra-oral volume was observed, affecting the bottom of the right upper sulcus; there was a negative response to the sensitivity test on tooth 12. The periapical radiograph showed the presence of an extensive periapical lesion involving the apices of teeth 11 and 12. In light of these findings, conventional endodontic treatment was chosen. The chemical-mechanical preparation was performed with X1-Blue mechanized files associated with 2.5% sodium hypochlorite and, after three changes of intracanal medication with calcium hydroxide, exudation through the canal persisted. Therefore, a periapical surgery was performed with curettage of the lesion, apicectomy and transsurgical obturation associated with AH Plus sealer. After 7 months of follow-up, complete regression of the periapical lesion was observed. In view of the limitations, the success of this case can be attributed to the association of endodontic treatment with the chosen surgical technique, since a repair of the periapical bone radiolucency was observed.

KEYWORDS: Apicectomy; Calcium Hydroxide; Curettage; Endodontics; Surgery.

CIRURGIA PERIAPICAL COM OBTURAÇÃO TRANSCIRÚRGICA DE DENTE COM EXTENSA LESÃO PERIAPICAL: RELATO DE CASO

RESUMO: Este trabalho tem como objetivo descrever um caso de tratamento endodôntico associado ao tratamento cirúrgico com curetagem apical, apicetomia e

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obturaç o transquir rgica de um incisivo lateral superior direito com extensa les o periapical. Paciente compareceu ao consult rio odontol gico relatando dor, inchaço na face e febre. Ao exame cl nico observou-se um aumento de volume extra e intra-oral acometendo o fundo de sulco superior direito; obteve-se resposta negativa ao teste de sensibilidade no dente 12. A radiografia periapical mostrou a presença de extensa les o periapical envolvendo os  pices dos dentes 11 e 12. Diante dos achados optou-se pelo tratamento endod ntico convencional. O preparo qu mico-mec nico foi realizado com as limas mecanizadas X1-Blue associado com hipoclorito de s dio a 2,5% e, ap s tr s trocas de medicaç o intracanal com hidr xido de c lcio, a exsudaç o via canal persistia. Diante disso, foi realizada uma cirurgia periapical com curetagem da les o, apicetomia e obturaç o transquir rgica associada com o cimento AH Plus. Ap s 7 meses de acompanhamento foi observado a regress o completa da les o periapical. Diante das limitaç es, o sucesso desse caso pode ser atribu do   associaç o do tratamento endod ntico com a t cnica quir rgica escolhida, visto que foi observado um reparo da radiotranspar ncia  sea periapical.

PALAVRAS-CHAVE: Apicetomia; Hidr xido de C lcio; Curetagem; Endodontia; Cirurgia.

CIRUG A PERIAPICAL CON OBTURACI N TRANSQUIR RGICA DE DIENTE CON LESI N PERIAPICAL EXTENSA: DESCRIPCI N DE UN CASO

RESUMEN: El objetivo de este art culo es describir un caso de tratamiento endod ntico asociado a tratamiento quir rgico con curetaje apical, apicetom a y obturaci n transquir rgica de un incisivo lateral superior derecho con lesi n periapical extensa. El paciente acudi  a la cl nica dental refiriendo dolor, hinchaz n en la cara y fiebre. El examen cl nico mostr  un aumento de volumen extra e intraoral que afectaba al surco superior derecho, con una respuesta negativa a la prueba de sensibilidad en el diente 12. La radiograf a periapical mostr  la presencia de una extensa lesi n periapical que afectaba a los  pices de los dientes 11 y 12. Se opt  por un tratamiento endod ntico convencional. La preparaci n qu mico-mec nica se realiz  con las limas mecanizadas X1-Blue asociadas a hipoclorito s dico al 2,5% y, tras tres cambios de medicaci n intracanal con hidr xido de calcio, persist a la exudaci n a trav s del conducto. Por lo tanto, se realiz  una cirug a periapical con curetaje de la lesi n, apicetom a y obturaci n transquir rgica asociada a cemento AH Plus. Tras 7 meses de seguimiento, se observ  una regresi n completa de la lesi n periapical. Dadas las limitaciones, el  xito de este caso puede atribuirse a la asociaci n del tratamiento endod ntico con la t cnica quir rgica elegida, ya que se observ  una reparaci n de la radiotranspar ncia  sea periapical.

PALABRAS CLAVE: Apicetom a; Hidr xido de Calcio; Curetaje; Endodoncia; Cirug a.

1. INTRODUCTION

One of the main causes of endodontic alterations is the presence of microorganisms in the pulp tissues, which establish an infection in the root canal system (SCR) (ABUSREWIL *et al.*, 2020). When this infection progresses to the periapex region, inflammation occurs resulting from the natural biological defense mechanism to

microorganisms from the root canal, developing apical periodontitis (ESTRELA *et al.*, 2014).

Apical periodontitis is a pathology of infectious origin and was related to an inflammatory response, which can generate bone destruction in the periapical region due to infections caused by pathogens in the SCR (BRAZ-SILVA *et al.*, 2019). In addition, it is an important sign for the main prognosis, since its presence indicates treatment failure, since it can appear, persist or reappear even after the end of endodontic therapy (SIQUEIRA JR; RÔÇAS, 2014). [Due to this, the](#) success of the treatment depends on the cleaning and disinfection of the ducts, reducing the number of these microorganisms as much as possible (MAZZI-CHAVES *et al.*, 2022).

Even in cases where the steps of endodontic treatment are carried out in a meticulous way, some microbial species, such as *Enterococcus faecalis*, may present resistance (DE ANDRADE FERREIRA *et al.*, 2007). The ability of this microorganism to adhere, colonize and form biofilms favors associations between species, increasing their resistance to antimicrobial substances (GUERREIRO-TANOMARU *et al.*, 2013).

When there is persistence of symptoms and the presence of extensive lesions, which even after clinical sessions of chemical-mechanical preparation (PQM) and use of intracanal medication these do not regress, we are facing a persistent infection, which can lead to failure of the endodontic treatment (CESTARI *et al.*, 2013; SIQUEIRA JR; RÔÇAS, 2014). Among these clinical manifestations, we have persistent exudation, presence of fistula and painful symptoms (LACERDA *et al.*, 2016).

In cases of persistent infections, conventional endodontic treatment can be associated with endodontic surgery (BERNABÉ *et al.*, 2005; AKCAY *et al.*, 2016). Surgical treatment emerges as a viable alternative for the resolution of these more complex cases, aiming at eliminating the area of difficult access and facilitating healing in the region. This treatment will promote sealing in the apex region, preventing recontamination of the canal, allowing bone formation and healing at the surgical wound site (KADIĆ *et al.*, 2018; BIOČANIN *et al.*, 2018).

According to the information described, the present study aims to report an endodontic treatment associated with endodontic surgery with periapical curettage, apicectomy and transsurgical filling of a right maxillary lateral incisor (12) that presents an extensive periapical lesion.

2. MATERIALS AND METHODS

The present work is a case report with descriptive purposes with a qualitative approach, in order to show its clinical relevance and facilitate research and new reports with the same theme, always based on evidence, using as a reference base (PEREIRA *et al.*, 2018).

The work received the patient's consent after signing a Informed Consent Term for participation and use of their images; was approved by the Research Ethics Committee under opinion number 5,409,871. All ethical and legal principles were respected in the treatment of patients in accordance with the precepts of the Declaration of Helsinki of Resolution 466/12 of the National Health Council (CNS).

Patient, male, 21 years old, presented to a private dental office complaining of pain, swelling in the face and fever. During the inspection examination, an increase in diffuse extra-oral volume was observed, affecting the upper lip region and the lateral region of the right nasal ala. Intraorally, the patient presented a diffuse swelling in the region of the bottom of the groove of the right maxillary central incisor (11), right maxillary lateral incisor (12) and right maxillary canine (13). Tooth 11 had a small resin restoration on the distal face, tooth 12 had a large restoration on the palatal face and tooth 13 was sound.

A positive response was obtained for the vertical percussion and mobility tests on tooth 12. The presence of periodontal pockets was not verified. During the cold thermal test, teeth 11 and 13 showed a normal response, and tooth 12 responded negatively. When performing the initial radiograph, the presence of an extensive periapical lesion affecting the apices of teeth 11 and 12 was observed (Figure 1). In view of the clinical findings, complementary and radiographic exams, an acute perirradicular abscess of tooth 12 was obtained as a diagnosis, and conventional endodontic treatment was chosen.

Figure 1: Initial periapical radiograph.



Because the patient had fever, pain and diffuse swelling, an oral medication of Amoxicillin 500 mg was prescribed to be used every 8 hours for 7 days, associated with Ibuprofen 600 mg every 8 hours for 2 days. At the return visit, the patient showed a reduction in the extra and intraoral volume increase. After infiltrative anesthesia, absolute isolation was performed with a rubber sheet and #211 clamp. Coronary access was performed with a diamond bur (#1014; KG Sorensen, São Paulo, SP, Brazil), in which purulent secretion was drained via the canal. An initial exploration was carried out associated with copious irrigation with 2.5% sodium hypochlorite (Biodinam, Ibipora, PR, Brazil).

After reducing the drainage, the real length of the conduits (CRD) was determined electronically with the aid of the RomiApex A-15 electronic foraminal locator (Romidan, Kiryat Ono, Israel) using a file fitted to the conduit, with the CRD set at 21.0 mm (Figure 2).

Figure 2: Radiography of odontometry.



The chemical-mechanical preparation (PQM) of the canal was carried out under copious irrigation with 2.5% sodium hypochlorite (Biodinamic, Ibiçora, PR, Brazil) using the X1-Blue 40 instrument (MK Life) powered by a coupled contra-angle electric motor (VDW Silver; VDW GmbH) in “Waveone All” mode, according to the manufacturer’s recommendations, followed by foraminal enlargement with hand files up to instrument #60. Due to the presence of the extensive periapical lesion and the drainage via the canal, an intracanal medication of calcium hydroxide associated with propylene glycol and iodoform was used as a dressing for the delay between the treatment sessions performed (20 days) (Figure 3).

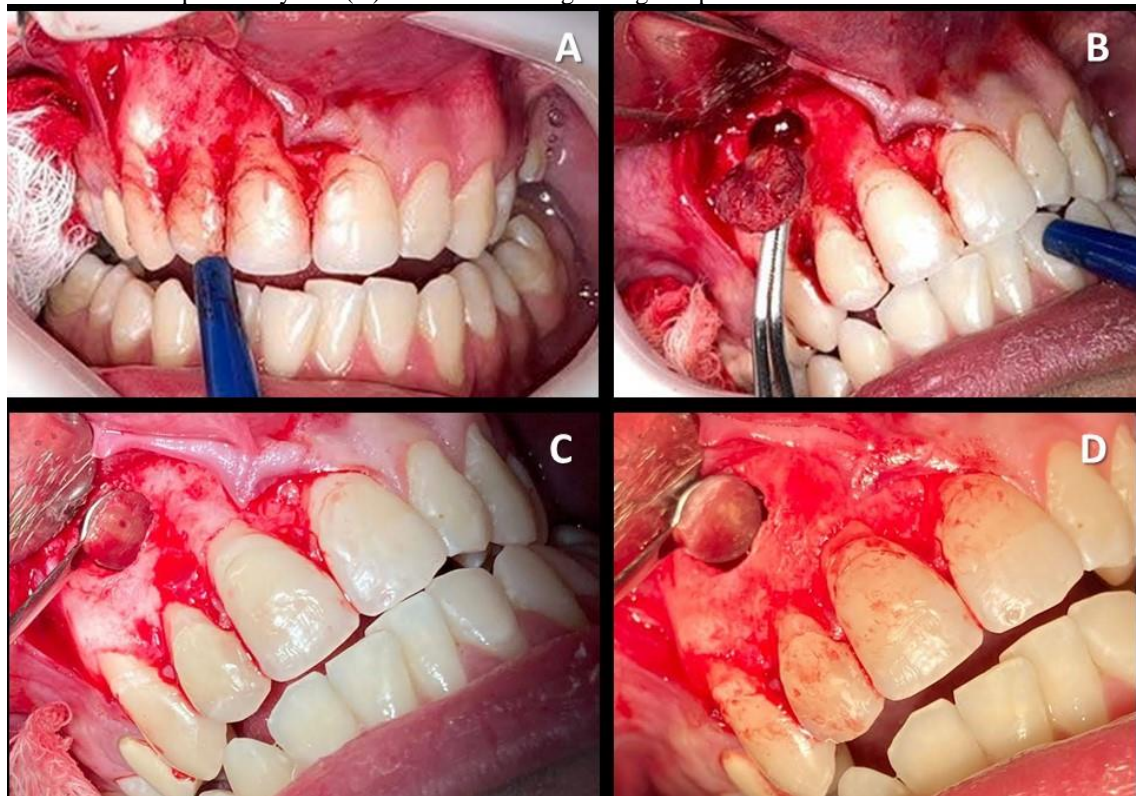
Figure 3: Radiograph showing the filling of the root canal with intracanal medication.



After 20 days, the patient returned, but drainage via the canal persisted. The PQM was redone, and a new intracanal medication was inserted for another 30 days. However, after this period, drainage was still present. In view of the persistence of intracanal drainage after 3 medication changes and the presence of an extensive periapical lesion, it was decided to perform a surgical endodontic treatment with apical curettage, apicectomy and intraoperative intracanal filling in tooth 12.

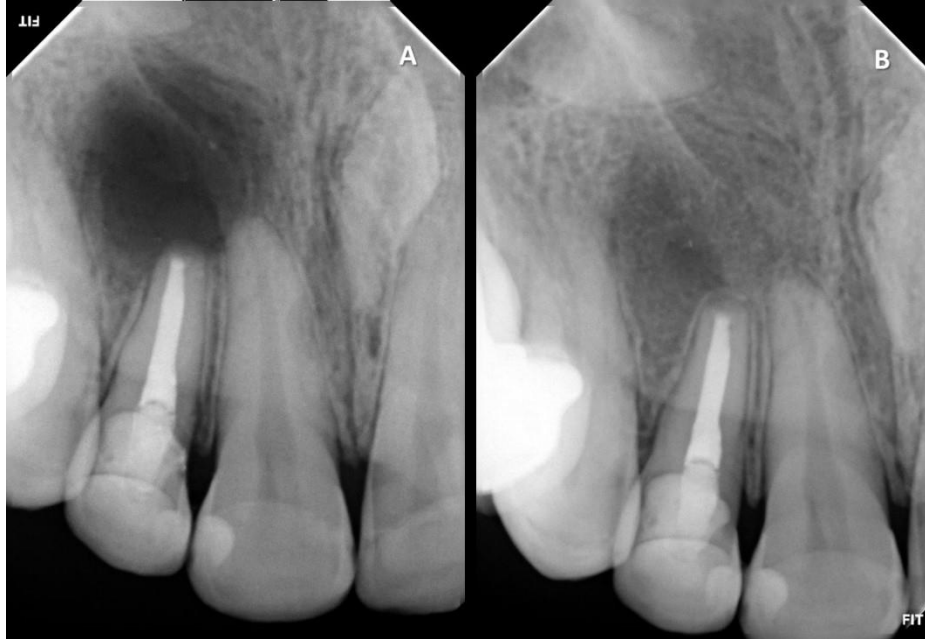
A simple linear intrasutural incision was performed extending from tooth 13 to 21, and a relaxing incision was performed on the distal of tooth 13 with mucoperiosteal detachment. After exposing the periapical region of tooth 12 (Figure 4A), the cavity was enlarged and a curettage of the lesion was performed with alveolar curettes under constant irrigation with saline solution (Figure 4B). Then, the apicectomy of tooth 12 was performed using a 701 surgical drill, removing the apical 3 mm (Figure 4C). After removal of the apical fragment, the protocols for the transsurgical filling of tooth 12 were followed. The root canal was irrigated with saline solution to prevent the formation of precipitate, followed by irrigation with 2% chlorhexidine digluconate (Perio Aid; Dentaïd, Barcelona, Spain) and the cone test was performed using an extra-long .08 taper gutta-percha cone (Tanari Industrial Ltda, Manacapuru, Brazil), the apical excess was cut. The cone was immersed in 2.5% sodium hypochlorite for 1 minute for disinfection. Then, the canal was dried with sterile absorbent paper points, and the filling was performed using gutta-percha and AH Plus sealer (Figure 4D). Excess cervical cone was removed and vertical compression was performed. The flap was repositioned with simple sutures and these were removed after 10 days. A periapical radiograph was taken immediately after the surgical procedure (Figure 5A) and the patient was instructed on care with brushing, mouthwash, and pulling the lip to see the surgical site, which may be at risk of major gingival retractions.

Figure 4: (A) Exposure of the periapical region of tooth 12; (B) Curettage of the periapical lesion; (C) Apicectomy and (D) Root canal filling with gutta-percha and AH Plus sealer.



During a follow-up visit, a definitive composite resin restoration was performed on tooth 12. The patient returned for radiographic follow-up after 7 months (Figure 5B) showing complete bone repair of the lesion, and is asymptomatic.

Figure 5: (A) Postoperative periapical radiograph; (B) Radiographic follow-up after 7 months.



3. DISCUSSION

The dental pulp is prone to be affected by oral pathogens through carious lesions, trauma and dentinal tubules, causing pulp necrosis (GALLER *et al.*, 2021). These bacteria and their by-products found in the SCR progress to the periapical region through the root foramen, forming the periapical lesions (AL KHASAWNAH *et al.*, 2018). Apical periodontitis is a polymicrobial disease (RÔÇAS; SIQUEIRA JR; DEBELIAN, 2011), and often presents as an asymptomatic chronic disease with a prevalence of 52% at the individual level and with a frequency of 39% in filled teeth and untreated teeth (TIBÚRCIO-MACHADO *et al.*, 2021). When it presents in an acute form, apical periodontitis can cause pain, presence of pus, tooth sensitivity and edema in the tissues related to the pathological process (GLICKMAN, 2009). The present study reported a case of a patient who presented with intra and extraoral abscess, pain and fever related to a primary infection of a maxillary lateral incisor with extensive periapical lesion.

There are cases in which even when the stages of endodontic treatment are carried out in a meticulous way, the persistence of clinical symptoms may occur, especially when these teeth are associated with periapical lesions of large diameters (DEL FABBRO *et al.*, 2016; ALGHAMDI; SHAKIR, 2020). These cases are related to the presence of resistant bacteria (ALGHAMDI; SHAKIR, 2020; ZAKARIA *et al.*, 2015). Among these clinical manifestations we have persistent exudation, presence of fistula, painful symptoms and abscess (LACERDA *et al.*, 2016). According to Siqueira and Rôças (2009), persistent infection has a microbiota formed by a smaller number of species or a

single species. In symptomatic apical periodontitis, the most prevalent bacteria are *D. invisus*, *P. endodontalis*, *S. moorei*, *Propionibacterium acnes* and *Streptococcus* species (RÔÇAS; SIQUEIRA JR; DEBELIAN, 2011). Furthermore, the species most frequently found in painful cases was *Selenomonas sputigena* (RÔÇAS; SIQUEIRA JR; DEBELIAN, 2011). Some studies also show the presence of *Enterococcus faecalis* in persistent cases (LACERDA *et al.*, 2016).

Persistent moisture, whether exudate or bleeding, prevents complete drying and consequent filling of the root canal. The main cause of this exudate is related to the presence of persistent intra or extraradicular infection (SIQUEIRA JR; RÔÇAS, 2014). In the case reported, even after performing the steps of mechanical chemical preparation and medication changes, intracanal drainage persisted. In this case, intracanal medication with calcium hydroxide was used, which has satisfactory antimicrobial activity, hemostatic, anti-inflammatory and biocompatibility action, has an alkaline pH and helps in tissue repair (VIANA *et al.*, 2021). Therefore, surgical intervention with simultaneous obturation was suggested to conclude the case.

Paraendodontic surgery aims to provide apical healing and eliminate bacterial contamination in that region by isolating the conduit (ALMEIDA-FILHO *et al.*, 2011). Different modalities are available for performing the surgical treatment, such as curettage, apicectomy, simultaneous filling of the canal, retropreparation and retroinstrumentation associated with retrograde filling (LEONARDO; LEAL, 1998). The choice to be made in relation to these modalities will depend on some factors, such as mastery of the technique, economic factors, the patient's case, among others (LEONARDO; LEAL, 1998). In the case reported, the surgical modality chosen was curettage, apicectomy and transsurgical obturation.

In the apical third of the tooth root there are some anatomical variations such as the presence of accessory canals and apical deltas, where their prevalence can be from 10% to 80% and 2% to 12%, respectively (MAZZI-CHAVES *et al.*, 2020), making it impossible to sanitize this region with only conventional endodontic therapy. In view of the presence of an extensive lesion, as in the case reported, apical curettage was performed in order to remove this pathological tissue and/or foreign bodies present around the end of the root (POP, 2013). In addition, some studies suggest the association of curettage with apicectomy, since if performed in isolation, there is a risk of recurrence of the lesion if the apex remains (BARALDI; PURICELLI, 2021). The success rate of

apicoectomy exceeds 90% (JADUN; MONAGHAN; DARCEY, 2019), thus confirming the indication of this modality together with curettage.

Simultaneous filling is characterized by a conventional filling of the canal at the time of the surgery. Its main indication is related to cases of comprehensive apical lesions, where even after a well-executed instrumentation and several MIC replacements, there is still inflammatory exudate, making it impossible to finalize the case (LEONARDO; LEAL, 1998). Furthermore, this technique results in a good seal along the entire conduit, when performed with curettage and apicoectomy (GUIMARÃES *et al.*, 2006), presenting a positive prognosis for these combinations of techniques, as was the case in the case discussed.

4. CONCLUSIONS

Thus, due to the persistence of intracanal drainage during the stages of endodontic treatment, which, even after the use of irrigating solutions and intracanal medication with calcium hydroxide with high antimicrobial power, it was necessary to use complementary therapies to achieve treatment success. This is associated with the presence of extensive periapical lesions and microorganisms resistant to treatment, with paraendodontic surgery being the best prognosis option for this case.

Although the study has limitations in relation to its design, as it is a case report, we can see that the surgical modality chosen with curettage, apicoectomy and transsurgical obturation was able to completely reduce the periapical lesion, leading to successful treatment. Despite the success obtained in this case, more studies need to be carried out for greater scientific dissemination of the diagnosis and treatment of more complex cases, involving a greater number of patients.

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