

Surgical-Endodontic Management of Periapical Cyst — A Clinical Case Report

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Abstract

Introduction: Dental pulp is a sterile connective tissue protected by enamel, dentin and cementum. A significant injury to the dental pulp causes inflammation which can lead to pulp necrosis if left untreated. Persistent inflammation can result in periapical radiolucency observed on radiological images. Periapical cysts are cysts that affect teeth with pulp necrosis. Most root cysts develop slowly and don't grow much. Patients do not experience symptoms, so lesions are often only detected during routine radiographic examination.

Case Presentation: Male patient, 56 years old, with no relevant systemic history. He attended the Hospital San Juan de Dios for endodontic treatment of tooth 1.2 with previously initiated therapy, without associated symptoms. *Diagnosis:* periapical cyst. *Treatment:* conventional non-surgical endodontic therapy was performed, and surgical therapy corresponding to enucleation and curettage.

Discussion: True periapical cysts of inflammatory origin require disciplinary treatment between specialties. Conventional non-surgical endodontic therapy achieves the elimination of the etiological factor located in the root canals, while surgical treatment eliminates the products of the true periapical cyst. These treatments as a whole have a high success rate in resolving the pathology if they are carried out according to standard and accepted clinical principles.

Conclusion: Periapical cysts usually present asymptotically, so their early detection is infrequent, which may allow this lesion to grow for long periods of time. Therefore, it is important to make a comprehensive diagnosis, using complementary tests.

Keywords: *Surgical-endodontic management; Periapical cyst; Dental pulp*

Introduction

The periapical cyst corresponds to the most frequent type of odontogenic cysts. They originate from inflammatory processes in erupted teeth, with a diagnosis of pulp necrosis. However, the literature has described that they may develop from crevicular epithelium, sinus epithelium or epithelial coverage of a fistulous tract (1, 2).

The persistent inflammatory stimulus of pulp necrosis causes proliferation of Malassez's epithelial debris, resulting in the formation of a cavity lined by epithelium. This cavity contains liquid, semi-solid or a combination of both, and separates the connective tissue from the necrotic contents of the cyst (2,3).

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Although most periapical cysts develop in the dental apex, adjacent to the apical foramen, in some situations they can appear adjacent to accessory foramina. The size of periapical cysts is variable, commonly measuring less than 1 cm in diameter. However, cysts can increase in size, especially if they develop in areas of adjacent teeth, such as anterior teeth (2, 3).

Radiographic visualization of radiolucent areas in dental apices are not considered diagnostic. It is not possible to differentiate through radiographic images whether the lesion corresponds to anatomical or pathological variants. Therefore, images are considered complementary examinations (3).

Histologically, periapical cysts are formed by fibrous connective tissue and stratified squamous epithelium, with variations in morphology, depending on the degree of inflammation. Microscopically, areas of papillomatosis, acanthosis, spongiosis phenomena, and in some cases fragmented and eroded atrophic areas can be observed (4).

Case Presentation

We present the clinical case of a 56-year-old male patient, with no relevant systemic history, from the city of Los Andes, Chile. Referred from primary health care to the Hospital San Juan de Dios de Los Andes, for endodontic treatment on tooth 1.2, with previously initiated therapy, without associated symptoms. On intraoral examination the patient presented gingivitis. A periapical radiograph was taken in which a radiolucent image was observed involving the central incisor and upper right lateral incisor (See Fig. 1). Diagnostic hypothesis: periapical cyst tooth 1.2.

Diagnosis: Periapical cyst associated with teeth 1.1 and 1.2

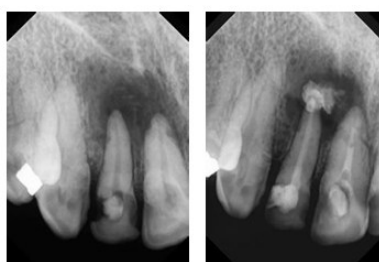


Figure 1 (A)

Figure 1 (B)



Figure 1 (C)

Figure 1 (A): Initial periapical radiograph. Radiolucent area is observed between dental apices teeth 1.2- 1.1

Figure 1 (B): Periapical radiograph intracanal medication. Both root canals are observed with radiopaque material corresponding to Bio-C® Temp, Angelus.

Figure 1 (C): Clinical photograph, prior to surgery.

Treatment plan

First session: Instrumentation and disinfection of root canal tooth 1.2. Intracanal medication with UltraCal™ XS-Calcium hydroxide paste- UltraDent.

Second session: Patient presents active dental fistula. Instrumentation and disinfection of root canal tooth 1.2. Intracanal medication with UltraCal™.

Third session: No improvement in signs and symptoms. Vitality test was performed on tooth 1.1, with no response. Trepanation of tooth 1.1 was performed, and intracanal medication with UltraCal™ was administered. Antibiotic therapy indicated: amoxicillin + clavulanic acid, 875/125, dosage 3 times a day, for 7 days.

Fourth session: Patient presents fistula, fistulography is performed, associated with intracanal suppuration. Instrumentation and disinfection with sodium hypochlorite 5.25%, use of endoactivator for 3 minutes. Irrigation with medical serum, subsequent irrigation with chlorhexidine 2%. Intracanal medication tooth 1.2 with Bio-C® Temp, Angelus.

Fifth session: Persistent active dental fistula associated with tooth 1.2. Instrumentation, disinfection and medication with Bio-C® Temp, Angelus. CT scan and referral to maxillofacial surgery.

Sixth and seventh session: Indication of pre-surgical medication: ketoprofen 50mg IV, dexamethasone 4mg/1mi IV, ampicillin 2g IV. Surgical procedure of enucleation and curettage, use of gelite Surgispon, and suture. Subsequent control and suture removal.

Eighth session: Patient without signs and symptoms of infection. Endodontic treatment is performed tooth 1.2. Use of Bio-C® Sealer, Angelus obturation cement.

Ninth session: Patient without signs and symptoms of infection. Endodontic treatment is performed tooth 1.1. Use of Bio-C® Sealer, Angelus obturator cement.

Tenth session: Post obturation control, good evolution.

Figure 2

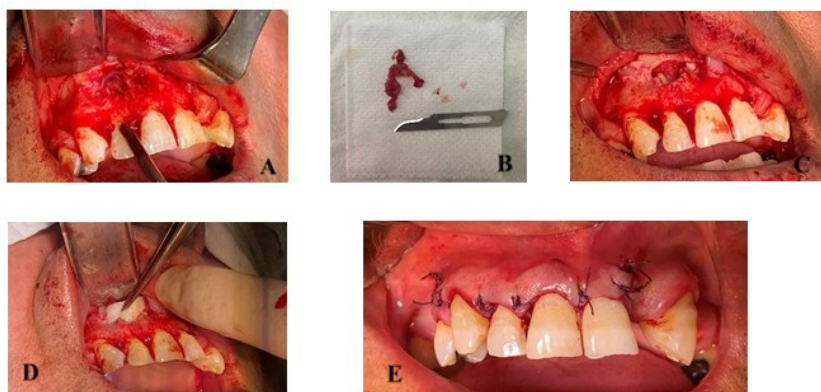


Figure 2 clinical images: (A): Periapical cyst located between teeth 1.1 and 1.2. (B): Periapical cyst content. (C): Bone cavity due to resorption. (D): Use of gelite. (E): Flap suture.

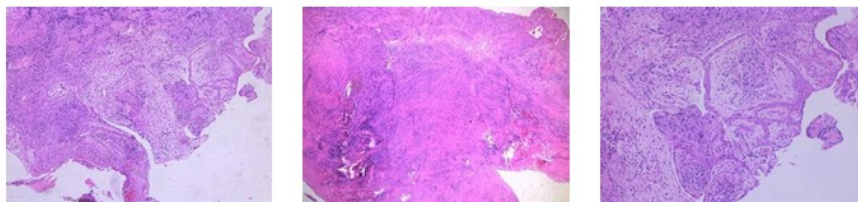


Figure 3 histopathological images: fibrous connective tissue and stratified squamous epithelium of variable thickness can be distinguished. Spongiosis phenomenon is observed.

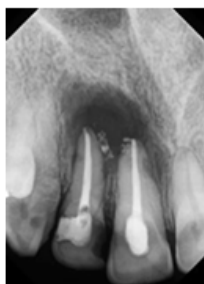


Figure 4: Final post-obturation radiograph. Radiolucent area is observed between teeth 1.1 and 1.2. Control evolution 6 months.

Discussion

Periapical cysts of inflammatory origin lead to bone resorption processes, which can reach large dimensions and present associated symptoms due to nerve compression (5).

Treatment for the resolution of periapical cysts can range from conventional non-surgical endodontic procedures to surgical interventions, including enucleation, marsupialization, and surgical resections (6).

The choice of cases for conventional endodontic therapy is limited to smaller cysts (7). When periapical cysts are larger in size, surgical treatment is recommended. The advantage of the latter treatment is the immediate rehabilitation, which involves fewer follow-up appointments and is considered a convenient option for patients. However, the disadvantages of surgical treatment are the large bone defects and possible damage to adjacent structures. Another disadvantage considered in the literature is the increased risk of infection at the surgical site (6). The surgical literature clearly recommends cyst enucleation, since marsupialization procedures carry the risk of leaving cystic cells that may have malignant potential (6).

The histopathological study is an invaluable tool for the definitive diagnosis, which allows a correct management of periapical lesions, since there are other pathologies that can present in a similar way (8).

Conclusion

In cases of large true periapical cysts, conventional endodontic therapy alone is not a good option and should be combined with enucleation and curettage of the lesion to avoid the risk of malignization of the cystic cells. Periapical cysts usually present asymptotically, so their early detection is infrequent, which may allow this lesion to grow for long periods, with the consequent bone resorption that these lesions cause. Therefore, it is important to perform diagnosis and treatment in a comprehensive manner, using complementary tests.

Conflicts of Interest

The authors declare no conflicts of interest.

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