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## Endodontic management of acute apical abscess: A case report

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### Abstract

Acute apical abscess is an inflammatory reaction to infection that may spread to extra-oral tissues. Knowledge of its clinical management is of paramount importance. This article describes the case of an 18-year-old girl who was referred to the Department of Endodontics of Autonomous University of Nuevo León. The patient complained of pain and progressive swelling in the right cheek region. The clinical diagnosis was acute apical abscess and a root canal treatment was performed. Follow-up appointments were done at 1 month and 16 months. Although the tooth was not restored, the patient was asymptomatic. In addition, radiographic examination revealed absence of periapical radiolucency at 16 months after endodontic treatment.

**Keywords:** Acute apical abscess, systemic antibiotic, endodontic treatment, clinical outcome

### 1. Introduction

Acute apical abscess (AAA) is defined as "an inflammatory reaction to pulpal infection and necrosis characterized by rapid onset, spontaneous pain, tenderness of pressure, pus formation and swelling of associated tissues" [1]. This disease is formed when infection contacts the periapical tissues through the apical foramen and an acute inflammatory response is induced followed by pus formation [2].

AAA is considered one of the most common causes of dental emergency [3]. Tissue damage in this condition depends on the bacterial counts, virulence factors and host response [4]. Likewise, high levels of endotoxins have been found in this pathology. Sousa *et al.* [5] reported that endotoxin reduction is improved when a chemomechanical preparation in conjunction with intracanal medication is performed.

Although root canals are not completely cleaned during an endodontic treatment [6], resolution of abscesses has been reported with these procedures [7]. In addition, the use of systemic antibiotics may be useful in the clinical management of these infections [8].

Knowledge of the clinical management of AAA is of paramount importance. Complications of this disease may be severe. Actually, a large number of hospitalizations have been reported due to dental abscesses [9]. The purpose of this article was to describe the endodontic management of an AAA in an 18-year-old girl. The patient presented inflammation of extra-oral tissues and was referred to the Department of Endodontics of the Autonomous University of Nuevo León.

### 2. Case Report

An 18-year-old girl was referred to the Department of Endodontics of the Autonomous University of Nuevo León. The medical history was noncontributory. The patient complained of pain and progressive swelling. Facial asymmetry in the right cheek region was observed (Figure 1A). During the clinical examination tooth #30 had a painful response to percussion and was nonresponsive to the pulp vitality test. Periodontal probing was within the normal limits. Radiographic examination revealed periapical radiolucency (Fig. 2A). The clinical diagnosis was acute apical abscess and an endodontic treatment was indicated.

After administration of local anesthesia, the tooth was isolated with rubber dam. The access cavity was performed under a dental microscope (Opmi Pico; Carl Zeiss, Oberkochen, Germany). The working length (LT) was determined using an apex locator (Root ZX II; J Morita, Irvine, CA) with K-files (SybronEndo, Orange, CA) and confirmed radiographically. During chemomechanical preparation there was no drainage of pus through the canals. Irrigation with 2.5% sodium hypochlorite (NaOCl) was performed with an open 30-gauge needle (NaviTip; Ultradent Products Inc., South Jordan, UT) at 2 mm from the WL. Calcium hydroxide was placed as an intracanal medicament. The tooth was coronally sealed with IRM (Dentsply International, Milford, DE) and Amoxicillin 500 mg was prescribed. After two days, a clinical

examination appointment was done. A decrease in inflammation (Figure 1B) and symptomatology was noted.

At the second treatment appointment (fifteen days after the first visit), the patient was asymptomatic and a significant decrease in facial inflammation was observed (Figure 1C). The canals were irrigated with 2.5% NaOCl and obturated with AH plus (Dentsply DeTrey GmbH, Konstanz, Germany) and gutta-percha. A permanent restoration was indicated.

Follow-up appointments were performed at 1 month (Figure 2C) and 16 months (Figures 1D and 2D). Although the tooth was not restored, the patient was asymptomatic in both follow-up appointments. In addition, radiographic examination revealed absence of periapical radiolucency at 16 months after endodontic treatment (Figure 2D).



**Fig 1:** Facial photographs. (A) Preoperative. (B) A decrease in inflammation is observed two days after the first treatment appointment. (C) Postoperative. (D) Follow-up at 16 months.



**Fig 2:** Radiographic examination. (A) Preoperative. (B) Postoperative. Follow-up at (C) 1 month and (D) 16 months.

### 3. Discussion

In this article, the clinical management of an AAA was performed by endodontic treatment in conjunction with the systemic administration of amoxicillin. Unfortunately, the tooth was not restored by the patient's decision. Systemic antibiotics are not generally used in apical abscesses. However, these drugs may be indicated in cases of abscesses associated with systemic involvement, disseminated infections resulting in cellulitis, progressive diffuse inflammation and in some medically compromised patients [8]. Also analgesics may be prescribed for pain management.

Most bacteria involved in endodontic infections are susceptible to penicillins. Amoxicillin is semisynthetic penicillin with a broad antibacterial spectrum and may provide a rapid improvement in pain and swelling [10]. In more complicated cases of AAAs, amoxicillin in conjunction with clavulanic acid or metronidazole may be necessary to achieve an effective antibacterial effect [11].

In addition to endodontic treatments, clinical management of AAAs includes surgical drainage and/or extraction of the involved tooth [12]. When drainage of pus is achieved, the patient may feel relief from pain due to the decrease in

periradicular acute inflammation. In some cases, the restoration of a tooth is not possible and a root canal treatment is not indicated. Given these limitations, dental extraction is the treatment of choice.

In the clinical management of AAA, knowledge of root anatomical variations also plays a crucial role during endodontic procedures [7]. Furthermore, intracanal medicaments may be indicated for their antibacterial properties [5].

### 4. Conclusion

In the present case report, the regression of AAA was achieved by endodontic treatment in conjunction with a systemic antibiotic. Although the tooth was not restored, the patient was asymptomatic at follow-up appointments. At 16 months, radiographic examination revealed absence of periapical radiolucency.

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