Large Bacterial Floc Causing an Independent Extraradicular Infection and Posttreatment Apical Periodontitis: A Case Report

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Abstract

This article describes a case of large persistent posttreatment apical periodontitis associated with 2 maxillary incisors, which was successfully managed by periradicular surgery. Histobacteriologic analysis revealed that the lesion was a granuloma that contained in its body a very large actinomycoticlike colony surrounded by accumulations of polymorphonuclear leukocytes and showing no direct communication with the root canal systems from both teeth. One incisor had no evidence of persistent intraradicular infection, whereas the other exhibited some residual dentinal tubule infection in the apical canal, which may have not significantly contributed to persistent inflammation given the organization and agglomeration of inflammatory cells around the large extraradicular bacterial colony. Findings showed that the main cause of persistent disease was the extraradicular infection in the form of a large bacterial floc, apparently independent of an intraradicular infection and as such only solved by surgery. *(J Endod 2018;44:1308–1316)*

Key Words

Apical actinomycosis, extraradicular infection, posttreatment apical periodontitis

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Significance

It is debated whether apical actinomycosis is an infectious entity independent of intraradicular infection. The present case report provides histobacteriologic findings that constitute the first strong evidence that in some cases actinomycoticlike colonies may cause independent extraradicular infection.

Although endodontic infections are generally restricted to the root canal system, bacteria may occasionally succeed in overcoming the host defenses concentrated near the apical foramina and cause an extraradicular infection (1). Bacteria occur in extraradicular infections as planktonic cells associated with acute abscesses, cohesive actinomycoticlike colonies located in the lesion body, or biofilms adhering to the outer apical root surfaces (2–7).

Extraradicular infections are commonly associated with symptoms and/or sinus tract formation and, given their location, may not respond to nonsurgical root canal treatment (4, 5, 8). There are many cases reported in the literature of lesions that were recalcitrant to nonsurgical treatment and that contained an extraradicular component of bacterial infection (2, 4, 5, 8, 9). However, only rarely was the extraradicular infection not associated with a concomitant intraradicular infection (5). It is conceivable that the rare cases in which the extraradicular infection becomes an independent infectious entity may be successfully managed by periradicular surgery only.

This article describes a case of a large apical periodontitis lesion that persisted after root canal treatment and was resolved by surgery only. Histobacteriologic analysis revealed that the cause of persistent disease was a large bacterial colony located outside the canal within the body of the apical periodontitis lesion, apparently independent of the root canal conditions.

Case Report

Case Description

A 17.5-year-old female patient was referred to an endodontist because of an extensive apical periodontitis lesion associated with the maxillary incisors as detected by routine radiographic examination (Fig. 1*A* and *B*). Both teeth #9 and #10 responded negatively to cold, heat, and electric sensibility tests. There was no tenderness to percussion or palpation, but the latter revealed a small indurated and nonfluctuant swelling adjacent to the apex of tooth #10 (Fig. 1*C*).

The patient reported trauma in the region of the maxillary left incisors when she was approximately 9 years old. When she was 11 years old, she was subjected to orthodontic treatment, which lasted for 3 years. Radiographs from this period revealed that a surgical procedure was required for traction of tooth #11, which was impacted (Fig. 1*D*). An area of external root apical resorption on tooth #10 was also apparent on radiographs and apparently remained stable over the course of the orthodontic correction of tooth positioning (Fig. 1*E*).

A radiograph from the orthodontist's files taken approximately 2 years after completion of orthodontic treatment revealed an apical periodontitis lesion involving

Figure 1. (*A* and *B*) Large radiolucency involving the apices of teeth #9 and #10. (*C*) Swelling adjacent to the apex of tooth #10. (*D*) A radiograph taken 8 years before at the beginning of the orthodontic treatment. (*E*) A radiograph taken at the completion of orthodontic treatment. Apical resorption on tooth #10. (*F*) A radiograph taken by the orthodontist 2 years later showed apical radiolucency involving both teeth.

both teeth #9 and #10 (Fig. 1*F*). The patient did not present any signs or symptoms. It is unknown why no treatment was indicated at that time.

Clinical examination revealed an uncomplicated dentin fracture in tooth #9 with a slight color change. Esthetic restorations involved the incisal and mesial surfaces of this tooth. The fracture line was oblique and apparently did not reach the pulp (Fig. 1*A* and *C*). The crown of tooth #10 showed no caries or restoration and no noticeable color change, but small vertical cracks affecting the enamel were observed.

The patient had no history of systemic disease. After signing an informed consent form, the patient agreed with treatment and the possible need for surgical complementation in case of an immediate or late unfavorable outcome. Before endodontic intervention, a cone-beam computed tomographic scan was requested for improved diagnosis, including evaluation of other possible changes related to the trauma or orthodontic treatment, and treatment planning (Fig. 2*A* and *B*).

Endodontic Treatment

Endodontic treatment protocols were essentially the same for teeth #9 and #10, except for the apical preparation size. After rubber dam isolation, the operative field was cleaned with 30% hydrogen peroxide and disinfected with 5.25% sodium hypochlorite (NaOCl). The coronal access cavity was prepared under an operating microscope (Microscope Opto DM, 2003; Opto Eletrônica, São Carlos, SP, Brazil). The working length was established 1 mm short of the apex using an electronic apex locator (Apex Finder 7005; Kerr Analytic, Orange, CA) and radiographs. The canal was prepared with the Reciproc instrument R25 (tooth #10) or R50 (tooth #9) (VDW, Munich, Germany) under copious irrigation with 5.25% NaOCl. Passive ultrasonic irrigation (PUI) with NaOCl was performed for 1 minute using an ultrasonic E1 Irrisonic tip (Helse, Santa Rosa de Viterbo, SP, Brazil) placed 1 mm short of the working length. PUI was repeated with 17% EDTA for 1 minute.