



Pulp Vitality Preservation of an Involved Tooth in a Large Radicular Cyst: A Case Report with 4-Year Recall

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The current case study presents the surgical endodontic retreatment of a central incisor with a large periapical cyst that had extended to the adjacent lateral incisor. After anaesthesia, a full mucoperiosteal flap was carefully incised and completely reflected. Then, the cyst was cautiously excised without performing curettage of the apical region of the adjacent tooth. A 3-mm deep root-end cavity on tooth #21 was prepared, filled and sealed with calcium-enriched mixture cement. At 6-month and 4-year follow-ups, tooth #21 was fully functional and exhibited no clinical signs/symptoms, and complete periapical healing was evident. This report indicates the importance of proper diagnosis as well as a careful surgical approach in the successful management of comparable cases without the overtreatment of involved teeth.

Keywords: Calcium compounds; Calcium-enriched mixture; Endodontics; Retreatment; Tooth pulp; Tricalcium silicate

Introduction

Periapical or periradicular cyst is considered the most common cystic lesion of odontogenic origin caused by inflammatory reactions, usually due to endodontic infections. The pathosis occasionally spreads to adjacent teeth causing their devitalisation [1, 2]. The treatment of periradicular cystic lesions with endodontic origin comprises the removal of etiological factors from involved teeth (i.e. bacteria and their by-products) as well as the elimination of lesion via surgical approaches [3]. Therefore, careful diagnosis next to comprehensive clinical and paraclinical evaluations of the involved teeth are necessary for the justifiable treatment and successful results.

Case Report

A 35-year-old female was referred owing to an abscess in the anterior region of maxilla; with severe local discomfort and pain as her chief complaint. Clinical examination showed regional swelling/redness/tenderness, and radiographic evaluation revealed a large periradicular lesion surrounding the roots of teeth #21 and #22; tooth #21 was endodontically-treated whereas the pulp of tooth #22 was intact (Figure 1A). Tooth #22 did not

respond to routine pulp sensibility tests; therefore, cavity test was performed. However, tooth #22 responded weakly to the test, and thus, was assumed vital. Additionally, cone-beam computed tomography showed a huge lesion; perforating the labial and palatal cortical plates, surrounding the roots of teeth #21 and #22 (Figures 1B-E). Possible treatment options, including the surgical endodontic retreatment only for tooth #21, were thoroughly explained to the patient. After her agreement with periradicular surgery, informed consent was obtained.

After premedication with ibuprofen 400 mg, mouth-rinse with 0.2% chlorhexidine, and proper anaesthesia, a syringe aspiration was performed, and 1.5 mL pus/blood were extracted (Figure 1F). Then, a full mucoperiosteal flap was incised, reflected and the lesion was carefully excised (Figure 1F) except for the periapical region of tooth #22. After the root-end resection of tooth #21, a 3-mm deep cavity was prepared using an ultrasonic retro-tip and was filled/sealed with calcium-enriched mixture (BioniqueDent, Tehran, Iran) cement as a suitable biomaterial used in similar cases [4-6] (Figure 1G). The removed specimens were sent for histopathological examination, which showed a radicular cyst lined by stratified squamous lining epithelium. In addition, there were foci of hemorrhage and a severe lympho-plasma cell infiltration in the fibrous cystic wall (Figures 1H-I).



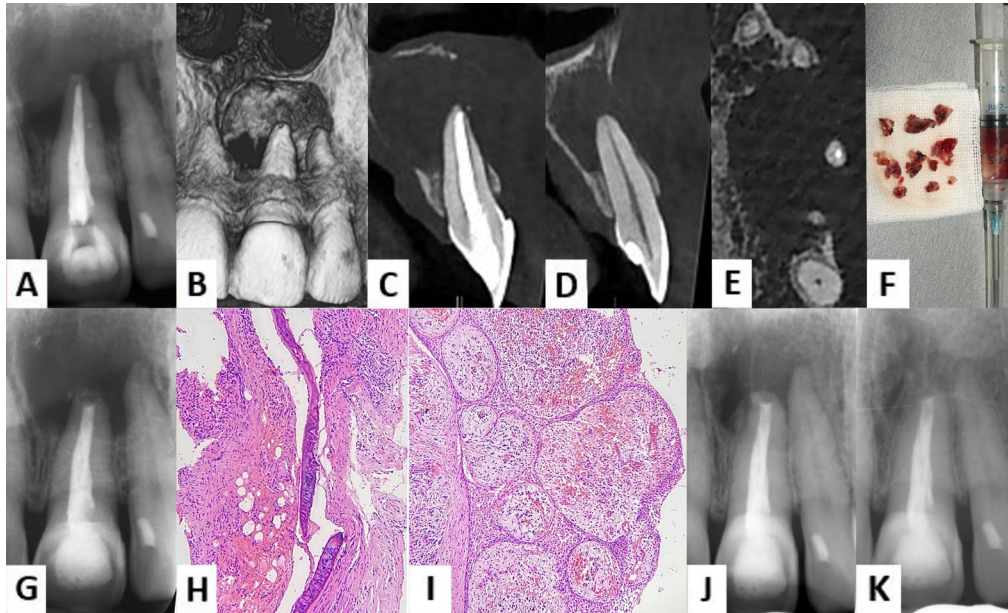


Figure 1. A) Periapical Radiography showing an oversized periapical lesion, previously endodontically treated tooth #21, and seemingly intact tooth #22. Tooth #22 had undergone a cavity test and exhibited clinical sensitivity to the performed test; B) Preoperative cone-beam computed tomography (CBCT) image showing large bone destruction and site perforation around the roots of teeth #21 and #22; C-E) CBCT images of teeth #21 and #22 revealing the previous root canal treatment of tooth #21 and seemingly sound tooth #22, with large periradicular radiolucency that had destroyed the labial/palatal cortical plates; F) Excision of the lesion and aspiration of its components using a syringe; G) Postoperative radiograph showing root-end resection and filling/sealing with calcium-enriched mixture cement as the endodontic biomaterial; H-I) Histopathological findings showing a squamous epithelial lining accompanied by the infiltration of inflammatory cells, representing a periapical cyst; J) Six-month follow-up denoting the regression of lesion and incomplete bone healing; K) 4-year follow-up radiograph showing the complete bone healing. Moreover, tooth #22 responded positively to the pulp sensibility tests and had normal PDL

After one week, the clinical symptoms (i.e. pain, swelling and sensitivity to percussion) were subsided. In 6-month recall, the radiographic evaluation showed incomplete healing of the lesion, specifically around the apex of tooth #22 (Figure 1J); however, at 4 years, the recall radiography presented complete bone healing and normal PDL of both teeth (Figure 1K).

Discussion

In the current report, through appropriate testing and examination of the tooth, the healthy state of a tooth, i.e. tooth #22, was preserved and despite a seemingly acceptable previous root canal treatment, the causative tooth #21 was properly diagnosed and surgically retreated to prepare a suitable matrix for bone healing and reconstruction. In managing such cases, the adjacent teeth should be carefully evaluated, and must be well protected during the surgical endodontic retreatment if they are not the causative factor. In conclusion, detailed attention to clinical signs/symptoms, appropriate examination, correct clinical judgment/interpretation, flawless treatment, and pertinent recalls are needed to verify successful outcomes.

Conflict of Interest: 'None declared'.

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