

Management of An Unusual Sequelae of Infected Radicular Cyst: Combined Surgical And Orthodontic Approach

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ABSTRACT

A large infected radicular cyst can cause cortical expansion that can further lead to cortical resorption. A radicular cyst causing displacement of left maxillary anterior teeth was surgically enucleated which, on healing, lead to root apex exposure of left maxillary central incisor in to the oral cavity. An orthodontic approach was then applied for alignment of displaced teeth and creating torque to correct root's labial inclination for root's soft tissue coverage. This case report aims to reveal multidisciplinary approach to treat a radicular cyst.

INTRODUCTION

Traumatic injuries to the teeth are relatively common, usually involving the anterior teeth of young patients. Such trauma is often followed by pulpal necrosis. If microbial infection occurs, a periapical lesion may develop; possibly evolving into a chronic inflammatory lesion.¹ Radicular cyst is a cystic lesion of inflammatory origin affecting a devitalized tooth. It is commonly found at the apex of an affected tooth due to extension of inflammatory stimulus from the apical foramen.² Radicular cysts are the most common of all jaw cysts and comprise about 52% to 68% of all the cysts affecting the human jaws. Actual prevalence of cysts is only about 15% of all apical periodontitis lesions.^{3,5,7} Cortical expansion and root resorption of the affected tooth and displacement of the adjacent teeth are common features of radicular cysts.⁴ In the present case report, extensive labial cortical bone resorption due to radicular cyst leads to exposure of root apex of tooth by causing soft tissue fenestration which is corrected orthodontic therapy.

CASE REPORT

A 10 year old male child reported to Department of Pedodontics and Preventive dentistry, with the chief complaint of pain and recurrent swelling in the left front region in the mouth since 1 year. Two years back, he had suffered trauma to anterior teeth from a fall and after 9 months of trauma, pain and swelling appeared which was relieved by medications.

Pain and Swelling reappeared 20 days ago before reporting. During examination it was found that the patient was in good general and physical health. Thorough intraoral examination was carried out which revealed hard, tender swelling (3cmX 2cm) with respect to 21, 22 and 23 causing obliteration of left labial vestibule and fractured 21 (Fig.1). Grade 2 mobility was seen in 21, 22 and 23. Pulp Vitality test showed negative response for 21 and positive response for 22 and 23. The crowns of 21 22 and 23 showed mesiopalatal angulations.

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Panoramic (fig.2) and periapical radiographs (fig.3) showed a well-defined unilocular radiolucency (2 cm X 1.5 cm) involving the apices of 21, 22 and 23 extending superiorly upto lower border of orbit and inferiorly to cervical margin of involved teeth. Roots of involved teeth revealed distal marked distal angulations on radiographs (Fig.2 & 3). A fine needle aspiration of the swelling showed a discharge containing pus. On the basis of clinical and radiographic findings, a provisional diagnosis of inflammatory infected cystic lesion was made.

It was decided to surgically enucleate the lesion after endodontic treatment of 21. A semilunar flap was raised and the cystic site was exposed, which showed a large bony cavity with missing buccal plate, filled with the cyst (Fig.4). Cystic enucleation was carried out and the cyst was removed in-toto. Closure was done following haemostasis. Splinting of 11, 21, 22 and 23 was done. The cystic sac was submitted for histopathological examination. Histopathological features were consistent with the clinical diagnosis of infected radicular cyst. Soft tissue fenestration was seen on complete healing exposing apex of 21 intraorally (Fig.5). 6 month postoperative OPG showed bone formation in the concerned area (Fig.6).

Orthodontic therapy started after 7 months of surgery for root coverage of 21. 16 and 26 were banded and brackets were bonded to all maxillary anterior teeth (Fig.7). Labial inclination of root of 21 was corrected applying torque by incorporating loops in Titanium Molybdenum Aluminium (TMA) wire. Root coverage occurred in 4 months. Debonding done 2 months after root coverage (Fig.8). A palatal bonded retainer was placed. Composite build up was done to restore fractured 21. Mobility of teeth gradually reduced and teeth were stable at the end of orthodontic treatment. The patient is on steady 6 months basis radiographic follow-up to evaluate bone formation.



Fig.1- Pre operative photograph showing swelling causing obliteration of vestibule.



Fig.2- Orthopantomogram showing radiolucency in 21, 22 and 23 apical region and angulation of roots.



Fig.3- Intraoral periapical radiograph showing radiolucency with respect to 21, 22 and 23.



Fig.4- Surgical exposure of cystic sac in large bony cavity.

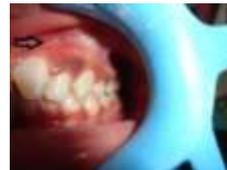


Fig.5- Soft tissue fenestration after healing showing root apex of 21 exposed intraorally.

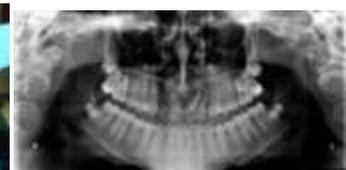


Fig.6- Six months postoperative OPG showing bone formation in area of radiolucency.



Fig.7- Photograph showing orthodontic bonding of maxillary anterior teeth 7 months after surgery.



Fig.8- Photograph showing root apex soft tissue coverage and alignment of maxillary anterior teeth following 6 months orthodontic treatment.

DISCUSSION

A radicular cyst is an odontogenic cyst of inflammatory origin preceded by a chronic periapical granuloma and stimulation of cell rests of Malassez found in the periodontal

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membrane.⁵ In the present case, the patient was presented with pain indicating infective nature of cyst.

Radiographically, the radicular cyst is a unilocular radiolucent lesion with well-circumscribed sclerotic borders that are often radiopaque. The lesion is associated with the apex of the tooth and a diameter of at least 1 cm is postulated to be necessary to differentiate it from that of a normal follicular space. Microscopic evaluation is necessary most of the time to define the type of lesion. In extensive cases, radiography alone may not be sufficient to show the full extent of the lesions, and advanced imaging may be needed.⁶ A marked distal angulation of roots of left maxillary anterior teeth in above case indicated displacement caused by cyst. The cyst may displace adjacent teeth and cause root resorption⁷. In our case radicular cyst displaced roots of 21, 22 and 23 labiodistally to a great extent, while root resorption was not obvious. The definitive diagnosis of the type of periapical lesion can only be made by a histological examination. However, a preliminary clinical diagnosis of a periapical cyst can be made based on the following: (i) The periapical lesion involves one or more teeth with necrotic pulps (ii) The lesion is greater than 200 mm² in size (iii) A straw-coloured fluid is produced upon aspiration or on drainage through an access (iv) The fluid contains cholesterol crystals.⁸

In planning the surgical intervention it is critical to be aware of potential complications that can occur during and after the intervention.⁹ We enucleated the cyst to ensure complete removal and reduce the risk of recurrence. 6 month postoperative OPG showed evidence of bone formation at operated site. A soft tissue fenestration with respect to 21 was observed after healing due non coverage of root apex by bone. The established communication had enabled the accumulation of food scrapings which posed a potential threat of the ensuing infection. Therefore, it was necessary to consider root apex coverage. As the position of exposed root apex was very labially, bone graft was not preferred, so soft tissue coverage was

planned by applying torque using fixed orthodontic appliance. This case is unique in the context of correction of root plane along with malalignment using orthodontic technique followed by surgical intervention for cyst removal.

Timely diagnosis and surgical removal of radicular cyst that had caused sufficient malalignment to intervene, following fixed orthodontic appliance therapy to rehabilitate the normal harmony for occlusion, aesthetic and obviously prevention from further infection, signify the importance of multidisciplinary approach to treat not only the pathology but also the sequelae of the same.

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