

Management of Infected Radicular Cyst by Surgical Approach using Bone Graft as an Adjunct

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Abstract

Radicular cysts are the most common cystic lesions affecting the jaws. They are most commonly found at the apices of the involved teeth. This condition is usually asymptomatic but can result in slow growth tumefaction in the affected region. Radiographically most radicular cyst appears as round or pear shaped unilocular radiolucent lesion in the periapical region. This case report presents the successful surgical management of large infected radicular cyst. To augment the repair, bone graft was placed.

Key Words: Radicular cyst, enucleation, apicoectomy

Introduction

Radicular cysts are the most common (52%-68%) cystic lesions affecting the jaws. They are most commonly found at the apices of the involved teeth, however they may also be found on the lateral aspects of the roots in relation to lateral accessory root canals.[1] Radicular cysts are direct sequel to chronic apical periodontitis but not every chronic lesion develops into a cyst. These cysts can occur in the periapical area of any teeth, at any age.[2] It is more frequent in maxillary than mandibular teeth.

Most of the radicular cyst are symptom less and are discovered when periapical radiograph are taken of teeth with non-vital pulps. Patient often complains of slowly enlarging swellings.[3] Radiographically most radicular cyst appears as round or pear shaped unilocular radiolucent lesion in the periapical region. The cyst may displace adjacent teeth or cause mild root resorption.[4] The treatment options for radicular cyst can be

conventional nonsurgical root canal therapy when lesion is localized or surgical treatment like enucleation, marsupialization or decompression when lesion is large.[5] This case report presents the successful surgical management of large infected radicular cyst.

Case report

A 37 years old male patient reported to the Department of Conservative Dentistry and Endodontics, Rural dental college, Loni, with a chief complaint of pain and swelling in labial vestibule for last one month. Patient gives History of trauma in upper anterior teeth 5 years back. He revealed that when the pus gets collected the swelling increases in size then discharges. Once the pus discharged the swelling subsides and reoccurs after some days.

On intra oral examination a swelling was present in the labial region, which was extending from 21 to 22 regions measuring 2.5 x 3cms. Swelling was soft and fluctuant in nature. Electric and thermal pulp vitality testing showed negative response in 21, 22 while adjacent teeth showed normal response. Teeth were painful to vertical percussion. Initially an IOPA and maxillary occlusal view radiograph was taken to know the extent of lesion which revealed a lesion involving periapical region of 21, 22 regions respectively (Fig.1). From the History and Clinical

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examination a provisional diagnosis of infected radicular cyst in 21, 22 was made.

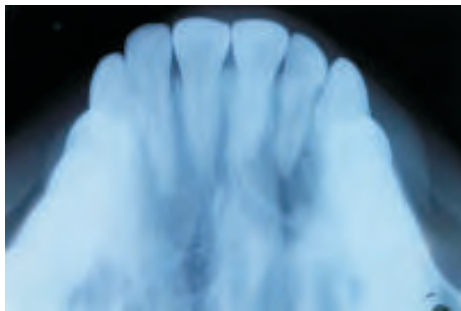


Fig.1 : Occlusal view of the lesion

Routine blood investigations and oral prophylaxis were carried out. Patient was prescribed prophylactic antibiotic a day prior to surgery.

Treatment planning was followed by explanation of the procedure to the patient and an informed consent was obtained. In the same visit root canal treatment was started followed by working length determination (Fig.2).

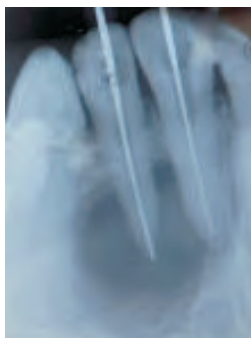


Fig. 2 : Working length determination

After complete cleaning and shaping, calcium hydroxide was used as an intracanal medicament for one week. In next visit root canal treatment was completed by obturation with guttapercha (Fig.3) followed by surgical enucleation of cyst, apicoectomy and retrograde filling of involved teeth.

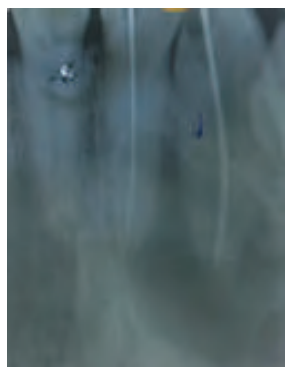


Figure 3: Master cone radiograph

The procedure is as follows: After administration of local anesthesia crevicular incision was given in labial region which extends from 11 to 23 regions. A full thickness mucoperiosteal flap was reflected and irrigated with normal saline (Fig.4a). Complete loss of buccal cortical plate was observed with 21 (Fig.4b). Complete curettage of the defect including cystic lining was achieved (Fig.4c). After thorough curettage of the granulosomatous tissue, the area was thoroughly irrigated using betadine solution. Root end of involved teeth were resected and retrograde filling was done with MTA.

Slight bleeding was induced from the bone cavity and PerioGlas (Nova Bone) ceramic crystals were directly compacted into the bony defect (Fig.4d).



Fig. 4a : Exposure of the cyst



Fig. 4b : Enucleation and curettage



Fig. 4c : Soaking of the saline pack placed in the cystic cavity



Fig. 4d : Achieving optimal haemostasis for retrograde filling.

The mucoperiosteal flap was approximated with interrupted sutures using 3-0 silk following hemostasis. Perio pack was applied on the surgical area. Immediate postoperative radiograph revealed satisfactory bone fill in the defect area (Fig.5).



Figure 5: Post obturation radiograph with bone graft

The histopathology report confirmed the diagnosis of an infected radicular cyst. Post-operative instruction given to the patient and patient was kept under Antibiotics and Analgesics. Patient was recalled at intervals of 1, 7 days 3, 6 months and 1 year.

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 membrane. Rests of Malassez are remnants of Hertwigs' root sheath. Although the source of the epithelium is usually a rest of Malassez, other sources, such as crevicular epithelium, sinus lining, or epithelium lining of fistulous tracts, have been suggested.[6] Radicular cysts are inflammatory lesions leading to bone resorption and can reach great dimensions and become symptomatic when infected or with great size due to nerve compression.[7,8]

The treatments of these cysts are still under discussion and many professionals option for a conservative treatment by means of endodontic technique.[9] However in large lesions the endodontic treatment alone is not efficient and it should be associated to a decompression or a marsupialization or even to enucleation.[10,11] In the present case due to the patient's apprehension regarding the presence of a swelling and also the lesions size and extent a surgical procedure was opted. After endodontic therapy, complete enucleation of cyst was done followed by apicoectomy and retrograde filling with glass MTA.

Post-surgical period was uneventful. The cystic lesion was submitted for histopathological examination. Histopathological features were consistent with the clinical diagnosis of infected radicular cyst. The cystic cavity was lined by non-keratinized stratified squamous epithelium with mixed inflammatory infiltration present. The choice of treatment may be determined by some factors such as the extension of the lesion, relation with noble structures, evolution, origin, clinical characteristic of the lesion, cooperation and systemic condition of the patient.

PerioGlas is bioactive glass composed primarily of silica, calcium, sodium and phosphorus. It is an amorphous crystalline and completely absorbable material. Its principle mode of action is by osteostimulation which stimulates and accelerates new bone formation in an osseous defect. In addition, the osteoconductive defect leads to new bone formation at the defect margin to the centre of the graft. Adjunctive benefit include

antimicrobial, antiinflammatory and hemostatic effect. These are result of alkaline nature of cations released by the graft which ensures rapid healing.

MTA, a refined "Portland cement" - calcium aluminosilicate cement-, was found to have less cytotoxic and better results in biocompatibility and micro-leakage sealing ability, giving it more success over root-end filling materials.

Conclusion

The clinical case reported in this article was managed successfully by endodontic therapy followed by surgery. It is suggested that the treatment of the radicular cysts should be defined according to the clinical and radiographic evaluations according to each case.

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