

Case Report

Radicular cyst of the esthetic zone: A case report on efficient management with periapical surgeries

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ABSTRACT:

Radicular cyst is the most common type of odontogenic cyst associated with the apex of non-vital teeth. The lining of the radicular cyst usually arises from the epithelial rests of Malassez. These cyst usually persists even after the elimination of microbial load from the root canals. Surgical removal is deemed necessary for the management. For larger lesions extending to the facial or palatal cortical plates, additional regenerative procedures such as bone grafting along with collagen membrane are warranted.

Keywords: cyst, radicular cyst, periapical surgeries, MTA plug, esthetic surgeries.

Received: 19 March, 2023

Accepted: 23 April, 2023

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This article may be cited as: Gupta H, Christian R, Tandon A, Kaul S, Dave R. Radicular cyst of the esthetic zone: A case report on efficient management with periapical surgeries. J Adv Med Dent Scie Res 2023;11(5):116-122.

INTRODUCTION

Radicular cyst is the most common inflammatory odontogenic cyst of the oral cavity in the tooth bearing areas. It is a epithelium lined pathological, hollow cavity which may or may not be filled with fluid and is associated with the apex of an erupted non-vital tooth, which slowly progresses from a periapical granuloma into a cyst (1). The inflammatory remnants from the necrotic tooth stimulate the epithelial rests of Malassez to proliferate and form lining of the cyst. The cyst occurs as a result of the long standing necrotic tooth which may remain static, regress or increase in size to occupy a large volume of the jaw bone(2). These cysts usually appear between third and the sixth decade of life with male predominance. The incidence of the true radicular cyst (without opening between root canal space and cyst lumen) is 8%-13%(3)(4, 5). Radicular cysts are commonly asymptomatic, and are noticed incidentally on radiographs. However, some chronic lesions that become symptomatic can present with swelling, mobility of the teeth and displacement

of unerupted teeth. In the maxillae, it can manifest as expansion of buccal or palatal cortical plates(6).

A general agreement among authors is that true periapical cysts are self-sustainable and have the tendency to persist even after elimination of the source of stimulation which is microbial load in the root canal space. This entails that the surgical intervention is unavoidable for such lesions

(5-7)

Endodontic surgery is the choice of treatment to conserve and manage the affected teeth. Also the larger lesions such as more than 2.5 cm are deemed critical size lesions and that have an unpredictable prognosis for complete bone regeneration.(8, 9)

Regenerative techniques, consisting of filling the enucleated lesion with the physiologic bone substitutes and covering the exposed cortical plates with the barrier membranes, have been suggested to enhance the status of bone regeneration specially in larger and through-and-through (tunnel) lesions(10, 11).

The objective of apical surgery is to retain teeth with persistent apical pathosis following orthograde root

canal treatment if endodontic non-surgical revision is difficult or associated with risks, or is even declined by the patient. Since the most frequent cause of recurrent apical disease is bacterial reinfection from the (remaining) root canal system, the bacteria-tight root-end filling is the most important step in apical surgery. In the early 1990s, mineral trioxide aggregate (MTA) was developed at the Loma Linda University in California/USA.

(12)

The present case report is regarding surgical management in a middle aged male who was diagnosed with a giant radicular cyst associated with maxillary anterior teeth perforating the buccal and palatal cortical plates.

CASE REPORT

The chief complaint of a 40-year-old male patient who presented to the oral and maxillofacial surgery department was pain and pus discharge from the area of his upper front tooth for the past four months, which was accompanied by intermittent swelling.(Fig 1 and Fig 2) His dental history revealed that he suffered upper front tooth trauma from a fall three years prior. He visited a dentist for dental care, and the subluxed tooth was splinted and left for further observation. The splint was removed after 6 weeks, and the patient has not experienced any symptoms since. However, the patient did note a history of pain, pus discharge, and swelling that has been present in the buccal and palatal planes of the anterior maxilla for the past three months and is intermittent in nature. The patients' dental hygiene was acceptable.

Fig 1: Preoperative profile



Fig 2: Pre operative Intra oral picture

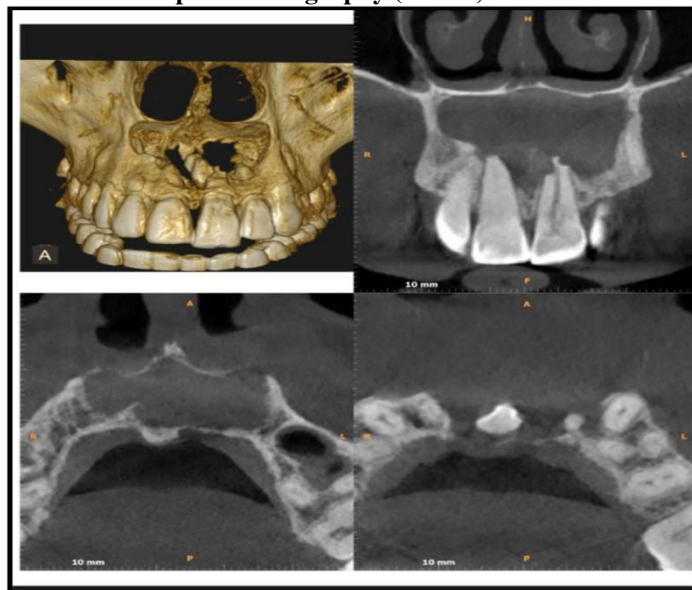


Upon initial assessment, it was discovered that the patient had an upper lip swelling obliterating the philtral fold and extending between the angle of the mouth bilaterally.

A periapical radiolucency suggestive of a periapical disease was present on a routine radiological examination (Orthopantomogram), as well as a supernumerary tooth that was superior to Left maxillary central incisor.

Following additional cone beam computed tomography (CBCT) analysis, it was determined that the patient has a well-defined radiolucency suggestive of a periapical cyst in relation to Left maxillary central incisor and a supernumerary mesiodense superior to Left maxillary central incisor. From tooth #11 to tooth #24, a large radiolucent lesion measuring 15 X 14.6 X 11.2 was seen.(Fig 3)

Fig 3 : Pre operative cone beam computed tomography (CBCT)



Periapical radicular cyst was suggested by clinical and radiological features. The diagnosis and available treatments were explained to the patient.

The patient was advised to follow the following course of treatment:

1. Successful root canal therapy for teeth #11–12, #21–22.
2. To stop micromovement, dentoalveolar splints are placed on teeth #13 to #23.
3. Cystic lining enucleation and procedure 21 for periapical surgery
4. Mesiodense extraction and debridement.

Following discussion, the patient chose the course of action and signed the informed consent form.

CASE MANAGEMENT

The endodontic treatment was completed, and then a thorough enucleation of the lesion with mesiodens extraction was planned as the course of treatment. For 11,12,21, and 22, the patient had endodontic therapy. During the surgical phase, planning for an

MTA plug was done for 11,21 due to the existence of a weeping canal with serous discharge from 11, and a totally calcified canal in 12,22 post-obturation. In 11,21, the patient received a temporary restoration and was referred to the department of oral and maxillofacial surgery for additional surgical treatment.

All aseptic procedures were followed while painting and draping were done. To stop micromovement of teeth, a local anaesthetic was applied to the upper anterior vestibule region and a dentoalveolar splint(Fig 4) was placed from the left canine to the right canine. Full thickness muco-periosteal triangle flaps were Raised (Fig 5) under local anaesthesia using two 2.2 ml cartridges of 2% lidocaine and 1:100,000 epinephrine, allowing access from tooth #13 to tooth #23. A through-and-through buccopalatal deficiency that extended as far as the nasal floor was present in the periapical region of tooth #22 and the bone there was paper thin and also Presence of supernumary tooth can be visualized. (Fig 6)

Fig 4: DentoAlveolar Splinting in relation to 13-23



Fig 5: Full thickness mucoperiosteum flap



Fig 6: Presence of mesiodens



In order to access the cystic area, the necrotic bone was removed using curettage and the osteotomy using a big round diamond bur until clean, healthy bony margins were reached. After completely enucleating the lesion and exposing the cystic lining, the mesiodens were removed. The enucleated cystic lining and its contents were sent for histological analysis after being preserved in 10% formalin solution.(Fig 7) The apical 3mm of tooth root #21 was sectioned to reveal the guttapercha in the canal using a straight fissure diamond bur that was directed perpendicular to the root's long axis.

Fig 7: Cystic Lining and mesiodens



As planned during the endodontic treatment phase, retrograde preparation was carried out using traditional endodontic surgical instruments and the cavity was filled with MTA plug in 11 and 21.(Fig 8) To confirm apicoectomy and retrograde seal, access material was taken out, and a periapical X-ray was taken. The cavity was then examined for any signs of the lining. Sharp bony borders were rounded off and the cavity thoroughly irrigated with Povidine-Iodine solution before being closed with 3-0 silk sutures.(Fig 9)

Fig 8: MTA plug in relation to 11,21.



Fig 9: Closure with 3-0 silk suture



The patient was doing well and the healing was going well on the seventh day of the follow-up.(Fig 10) After a week, the patient was contacted and the sutures were removed.

Fig 10: 7th Post operative day healing

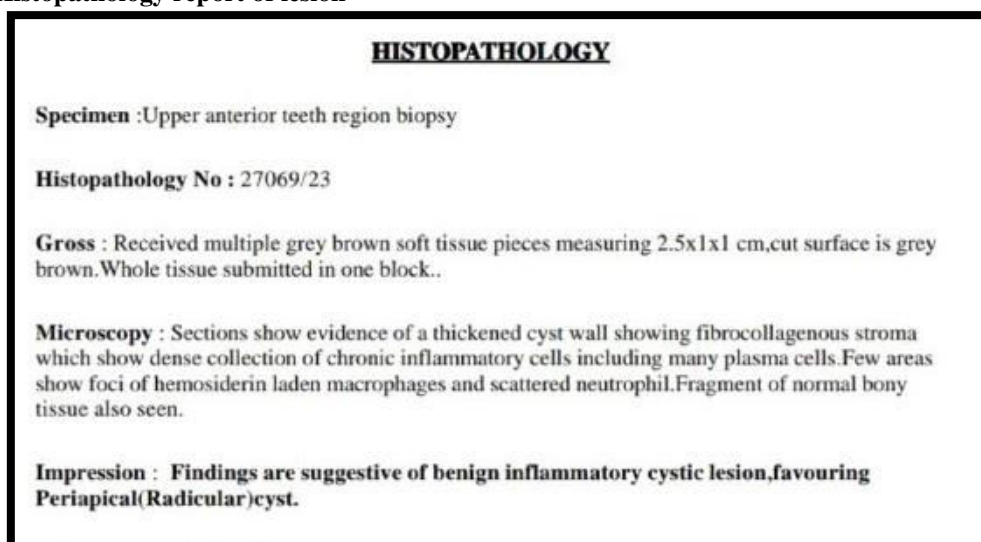


Patient had no discomfort, tooth mobility, Sinus tract, Oedema, or other issues at the 3-week follow-up.The Patient had a smooth healing process and no significant issues at followup.(Fig 11) Radicular Cyst was discovered following an excisional biopsy of the Lesion. (Fig 12)

Fig 11: 3rd week follow up



Fig 12: Histopathology report of lesion



DISCUSSION

The current case has an extensive defect extending from upper right central to upper left lateral incisor, approaching the nasal floor. Such cases are usually chronic, progress slowly, leading to mobility of teeth, but in our case there was absence of tooth mobility or root resorption and the lesion remained silent (13). Appropriate radiographs and histopathological evaluation is necessary for diagnosis of such giant lesions, therefore CBCT evaluation was warranted (14).

According to the CBCT there was a well defined radiolucent lesion measuring 15× 14.6×11.2 mm, lined with radioopaque borders and also shows presence of a supernumerary tooth mostly suggestive of a mesiodense.

The treatment of choice depends upon the size and location of the lesion. In this case, conservative minimally invasive procedures were not an option (14). The missing buccal and palatal cortical plates allow fibrous connective tissue proliferation and growth into the bony defect, thereby hindering bony formation and leading to scar formation resulting in incomplete healing (10).

According to Pecora et al, large bony through and through lesions should be treated with periapical surgery with Guided Tissue Regeneration (GTR) procedures in order to promote the regenerative healing process and to prevent proliferation of undesired cell populations in to the defect yielding successful outcomes (15).

Preclinical studies clearly showed that MTA has a high sealing capability, a good material stability and an excellent biocompatibility. Multiple experimental studies in animals highlighted the mild tissue reactions observed adjacent to this material. Furthermore, histological analysis of the periapical regions demonstrated a frequent deposition of new cementum not only onto the resection plane (cut dentinal surface), but also directly onto MTA (12) hence in the treatment planning also we have decided to provide a perfect apical seal with the help of mineral trioxide aggregate.

Sub marginal incision technique was used to raise a full thickness muco-periosteal flap as it is preferable in the aesthetic zone to avoid gingival recession (16). Conventional method of using curettes to remove the infected soft tissue and separate the cystic lining from the bony crypt was used. This had to be done cautiously in order to avoid perforation of the delicate nasal floor (17).

According to the criteria of Von Arx and Kurt, the present report shows a successful outcome after one month follow up.

CONCLUSION

Compared to the conventional non-invasive procedures for the management of large periapical lesions associated with lower success rates, MTA plugging has improved prognosis in such cases. Based

on our 2 month follow-up, it can be concluded that cystectomy with MTA plugging procedures lead to successful healing outcomes in cases of extensive cystic lesion affecting both buccal and palatal cortex of the jaw bone

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