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Manuscript Title Page: The most common inflammatory odontogenic cyst- A case report

1). Dr.Maroofa Hafiz, 2).Dr.Marikinda Manzoor, 3).Dr.Rakhshunda Manzoor, 4). Dr Mansha Hassan,

Post Graduate Student, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan.

Post Graduate Student, Department of Conservative dentistry and Endodontics,Jaipur Dental College, Jaipur, Rajasthan.

Post Graduate Student, Department ofPediatric and Preventive dentistry, Jaipur Dental College, Jaipur, Rajasthan.

Post Graduate Student, Department of Oral and Maxillofacial Surgery, Jaipur Dental College, Jaipur, Rajasthan.

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ABSTRACT:
Radicular cyst is derived from the epithelial cell rests of Malassez. They are the most common among all jaw cysts ,comprising about 52% to 68% .The tooth associated is nonvitaland usually asymptomatic , thus mostly diagnosed accidently during routine radiographic investigations.It may be secondarily infected and canresult in pain, swelling, tenderness and tooth mobility.Treatment depends upon the sizeof the cyst and includes endodontic procedure, extraction of offending tooth, enucleation with primary closure and marsupialization or a combination of these options . The present report describes the case of a radicular cyst of anterior maxillary region in a 25 -year-old male patient managed in two steps first root canal treatment was done followed by enucleation and apicectomy with primary closure.

KEYWORDS: Radicular cyst, enucleation, apicectomy, retrograde.

INTRODUCTION:

The radicular cyst is the most common inflammatory odontogenic cyst in the jaw[1].The cyst originates from the epithelial cell rests of Malassez[2]. It is usually associated with a non vital tooth. Radicular cysts areusually symptomless and are discovered when periapical radiographs of non vital teeth are taken.[3]The lesion is seen most often in the males during their third and fifth decades of life[4]. Depending on the size of the radicular cyst treatment can vary from a simple conventional therapy to surgical intervention[5].

The purpose of this article is to present a case of infected radicular cyst managed successfully by a combination of endodontic treatment followed by surgical enucleation of the cystic lesion.

Case report:

A 25 year male patient reported to the department of oral and maxillofacial with the chief compliant of mild pain, pus discharge and swollen gums in relation to the upper front and left region of teeth since one month. Patient also complained of tooth discolouration in upper front tooth regionand recalled history of trauma 2 years back.Extraoral examination revealed slight swelling on left side of face. On intraoral examination there was palatal swelling extending from teeth 11 to 25, crossing the midline of the palate. On palpation, the lesion was soft and fluctuant. Draining sinus tract was present in relation to 22. Lymph nodes were non-palpable. Teeth were tender on percussion. (Fig 1)

The patient was advised for cone beam CT, but he was unwilling for CT as he was poor and had financial constraints. Hence he was advised for orthopantamograph, intraoral periapical radiograph, maxillary occlusal radiograph and routine laboratory investigations.(Fig 2) Radiographic examination revealed a large unilocular radiolucency without well-defined radiopaque border which may be due the infection. Routine laboratory investigations were within normal limits. Fine needle aspiration revealed turbid brown-coloured fluid, consisting of dense infiltrate of acute inflammatory cells, predominantly polymorpho nuclear luekocytes. Cytological picture was suggestive of an acute inflammatory lesion. Based on clinical, radiological and analysis of aspirate, a provisional diagnosis of an infected radicular cyst was made. The patient was advised for endodontic treatment and surgicalenucleation of the cyst. In first appointment RCT was done with respect to 11,21,22,23,24 and 25. In next appointment careful

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enucleation of cyst was planned under general anesthesia. Two vertical releasing incisions mesial to 16 ans26 joined by a Sulcular incision was given. Trapezoidal mucoperiosteal flap was raised. The overlying thinned bone was removed with bur under copious irrigation to expose the cystic mass. Careful enucleation of the cyst followed by curettage was done. Apicoectomy followed by retrograde filling with MTA(Mineral Trioxide Aggregate) was done with respect to 11,21,22 as intact bone was present all around the apices of adjacent teeth. Excised tissue was sent for histopathological investigation. Necessary prescriptions and postoperative instructions were given. Patient was kept on follow up.(Figure 3)
Histopathological examination revealed a cystic cavity lined by nonkeratinized stratified squamous epithelium arranged in an arcading pattern, interspersed with intense inflammatory cell infiltration consisting chiefly of lymphocytes and plasma cells. Russel's bodies were also noted at places. The histopathological findings confirmed the diagnosis of infected radicular cyst.(Figure 4)

DISCUSSION

Periapical (radicular or apical periodontal) cysts are by far the most common cysts of the jaws. These inflammatory cysts derive their epithelial lining from the proliferation of small odontogenic epithelial residues (rests of Malassez) within the periodontal ligament[6]. Radicular cysts are usually diagnosed during routine radiographic examination[4]. Radicular cyst occurs more commonly in the maxilla that is 60% as compared with mandible, and is associated with either buccal or palatal enlargement[7].The present case was associated with a more of palatal and slight buccal involvement. Radicular cysts grow slowly and can lead to root resorbtion, mobility and displacement of teeth. Initially there is no pain but once infected it may lead to pain and swelling[8]. In our case no mobility, root resorption or displacement of teeth was seen . Radicular cystic lesions if left untreated undergo asymptomatic evolution. The bone in the surrounding area will be thinned out leading to cortical plate expansion, with springiness and egg shell crackling[9]. Based upon the opening of the root canal to the epithelial-lined cavity, radicular cyst can be categorized into bay cyst or apical cyst[10]. In case of a bay cyst the cystic cavity with epithelial lining is open to the root canal. Due to its similarities with the marginal periodontal pocket it is now termed as periapical pocket cyst[2]. In apical cyst, the cystic cavity is having complete epithelialization but no opening into the apical foramen and root canal[10].

There are various theories put forward for explaining the formation of this cyst. Torabinejad (1983) has put forward two theories to describe the pathogenesis of radicular cyst according to the "breakdown/nutritional deficiency theory" and "abscess cavity theory." The "breakdown" theory suggests that after provocation, the epithelial cells continue to proliferate following which the central cells become deprived of nutrition from the surrounding connective tissue and undergo liquefactive necrosis, leading to the development of a microscopic cyst. According to the "abscess cavity" theory, the epithelial cells proliferate and line a preexisting cavity (abscess) because of their inherent tendency to cover exposed connective tissue surfaces. This theory was also supported by Mcconnell[11]. However, the most accepted theory is the epithelial breakdown theory and is also supported by previous articles[2,11].

The radiographic appearance of radicular cyst is round or pear-shaped unilocular radiolucency with radiopaque hyperostotic borders at the apex of a non-vital tooth. However, in case of infected or rapidly enlarging cysts, the radiopaque margin is not usually present[9] as seen in the present case also.
The cystic fluid has an important role in the diagnosis of odontogenic cysts. The cystic content may vary from a clear, straw coloured fluid to a solid cheese-shaped lump. Total protein content usually varies between 5 and 11 g/100 ml, greater in comparison to other odontogenic cysts such as odontogenickeratocyst and dentigerous cyst[12].

Histologically, the cystic cavity is lined by nonkeratinized stratified squamous epithelium. The cystic lumen contains fluid with low concentration of protein and collection of cholesterol clefts (Rushton bodies) with multinucleated giant cells. Acute and chronic inflammatory infiltrate are present subepithelially[13]. Few cases are reported with hyaline bodies representing a secretory product of the odontogenic epithelium in radicular cyst. The presence of cholesterol crystals arise from the disintegration of red blood cells, lymphocytes, plasma cells and macrophages[14].

Depending upon the type, size, location and extend of the cyst ,treatment can be planned. Treatment options available are conventional endodontic approach combined with decompression[15] or surgical enucleation of the cyst with extraction of the offending tooth[16]. Endodontic treatment alone is not sufficient and thusshould be associated with decompression or marsupialisation or even with enucleation in cases of massive lesions[17]. In case of small lesions,approximately 1 cm in diameter, most clinicians opt for

conventional endodontic treatment .Endodontic treatment of radicular cysts substantially reduces the microbial load from the root canal and thus prevents reinfection by orthograde filling[18].Lesions that fail to resolve after such therapy may be successfully managed by extraction of the offending non-vital teeth and curettage of the epithelium in the periapical region[18].The other options suggested are surgical decompression to reduce the size of the lesion followed by marsupialisation or complete enucleation, to reduce the risk of damage to other teeth and anatomic structures[19].

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Figure 1,Clinical pictures of patient.

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Figure 2, a)Maxillaryocclusal radiograph b)Orthopantomograph.

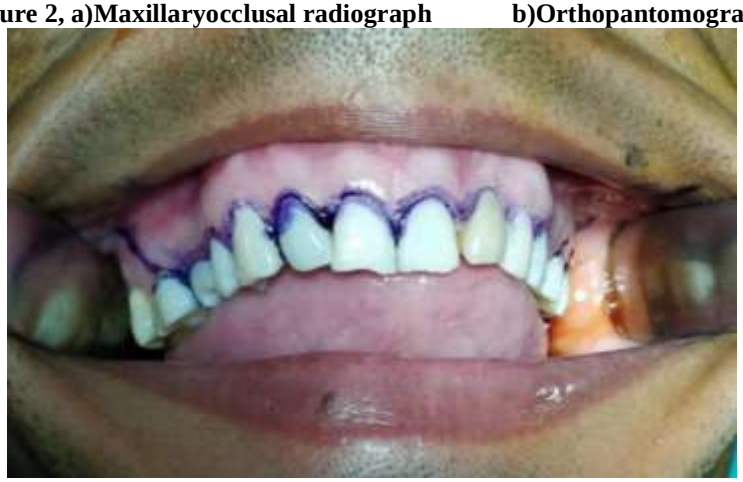

Figure 3,a) Incision.

b) Full thickness mucoperiosteal flap reflected

c) Cyst enucleation.

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d)cystic cavity and apicoectomy of 11,21,22.

e) Primary closure done with 3-0 vicryl .

f) Postoperative panoramic radiograph.

g) 1 day after surgery.