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Radicular Cyst Involving Anterior Maxilla

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ABSTRACT

Radicular cysts are a type of inflammatory origin cysts and mostly formed in the area of apical periodontitis of a tooth having infected or necrotic pulp. Radiographically, radicular cysts appear as an osteolytic lesion at the periapex of carious or endodontically involved teeth. Clinical diagnosis of a radicular cyst is rare and almost impossible, hence radiological and histological examinations are crucial for definitive diagnosis. Initial treatment of all endodontic periapical lesions should be conventional endodontic root canal therapy and larger cysts should be enucleated to remove cystic lining and prevent recurrence or formation of residual cyst after extraction. We present a case of radicular cyst involving the anterior maxillary segment of the oral cavity in a 27-year-old patient.

KEY WORDS: Radicular cyst, Anterior Maxilla, Enucleation

INTRODUCTION

One of the most common inflammatory odontogenic cysts of the jaw is radicular cyst. Most of these lesions involve the apex of infected pulp of the tooth and appear as well-defined radiolucency. Radicular cysts comprise about 52-68% of all the cysts affecting the jawbone. Most commonly seen in association with permanent dentition[1]. Mostly involved regions of the jaws include Maxillary anterior and Mandibular premolar region[2].

On radiographic examination the radicular cysts can be seen as ovoid or round, uni- or multi-locular radiolucency attached at the apex of a nonvital tooth. They have a corticated margin which extends from the lamina dura of the involved teeth. However, this cortication might disappear in the case of rapid extension, inflammation or secondary infection[3].

Radicular cysts are usually asymptomatic (discovered accidently during routine radiographic examination) but may cause symptoms if they become infected[4].

Mostly commonly affected individuals from radicular cysts are from the third to fifth decade of life and also a mild male predominance is also seen[5].

According to Simon, radicular cyst can be divided into two types:

1. True radicular cyst which have epithelial lining through its entirety.
2. Periapical or bay cyst in which the epithelium is attached at the margins of the apical foramen in which the cystic lumen opens to the involved root canal[6]. According to Nair, 39% were pocket cysts and 61% were true cysts[7].

Most accepted hypothesis of formation of cyst is of epithelial cell rests of start regenerating and proliferating causing formation and growth of cyst, after receiving appropriate signals such as inflammatory cytokine and growth factors[8].

CASE REPORT

A 27-year-old male presented to the department of Oral Medicine and Radiology with the complaint of pain in front right region of the upper jaw for 1 week. No discharge or swelling was reported by the patient

but gave history of trauma to maxillary right central incisor 4 years back. No relevant medical, Dental or Family history was present neither any deleterious habit.

On intraoral examination, discoloured right central incisor was observed along with a diffuse erythematous swelling measuring 1.5 cm (anterio-posteriorly) and 0.8cm (superio-inferiorly) of attached alveolar mucosa of right central and lateral incisor involving labial frenum, which appear raised, extending into labial vestibule (Fig.1). No palatal swelling or tenderness was evident.

On palpation swelling appeared soft, fluctuant and compressible. Labial and palatal cortices showed no expansion; labial cortex was not palpable under the swelling. No mobility was seen in the teeth that were involved in the lesion.

Chairside investigations revealed right central and lateral incisors non-responsive to pulp vitality testing although right canine was vital. On aspiration of the swelling pus mixed with blood was seen (Fig.2)

On radiographic investigation:

Maxillary occlusal topographic view (Fig.3) and IOPA (FiG.4) involving 11, 12, 13 showed Ill-defined and partially corticated radiolucency (measuring 3x2cm approximately) with epicenter between 11,12 extending anteriorly into alveolar crest of 11,12; medially approximating midline palatal suture up to contralateral aspect of mesial apical 3rd of 11; laterally the cortication was ill defined with decreased radiodensity showing loss of trabeculae pattern 13 but did not involve it; superiorly it showed partial cortication and superimposition with the floor of nasal cavity.

Periphery of the lesion was poorly defined and internal structure does not appear homogenous giving appearance of rarefying radiodensity as the lesion progresses towards the normal bone. Apical third root of the right lateral incisor was resorbed. Root canal of right lateral incisor was not evident appearing to be completely calcified.

OPG of the lesion proved to be showing no new information so is not included in the case report.

A provisional diagnosis of infected Radicular cyst involving right maxillary incisors was made. Decision was made to do the enucleation of the cyst along with root canal treatment of Maxillary right central incisor.

Procedure: Informed consent of the patient was obtained before the surgical procedure. Root canal treatment was done of Maxillary right central incisor and under local anaesthesia, the buccal mucosal flap was lifted from the area. Absence of labial cortical bone was evident over the lesion (Fig 5). The cyst was enucleated via labial approach and the cyst wall was sent for histopathological examination.

Because of the large defect caused by the lesion after the enucleation, it was decided to administer bone graft to the operated area in order to accelerate the healing process (Fig 6).

Postoperative instructions were given to the patient; analgesic and antibiotic (amoxicillin + clavulanic acid 500/125 mg thrice daily) drugs were prescribed for 5 days. Regular clinical and radiographic follow-up was planned. The patient healed uneventfully without any complications post operatively and no recurrence was observed. Fig 7 & 8 showed 4-week postoperative patient.

Histopathology report showed Multiple fragments comprised of fibro-collagenous tissue devoid of overlying lining epithelium with vascular proliferation, haemorrhage and moderate lymphoplasmocytic infiltrate. Separate fragments of inflammatory granulation tissue. Fragments of dead bony spicules and anastomosing trabeculae of woven bone suggestive of an Inflammatory Cyst (Fig 9).

DISCUSSION

Radicular cyst is a type of inflammatory odontogenic cyst, they might arise from the epithelial residues in

the periodontal ligament due to apical periodontitis following the death and necrosis of the dental pulp. Radicular cysts are usually diagnosed while routine radiographic examination or following their acute exacerbation.

Prevalence of the radicular cysts in the maxilla is 60% as compared with mandible[1], as seen in this case. In the initial stages of the lesion, the radicular cysts are bony hard which may become very thin despite initial sub-periosteal deposition of the bone when their size increases. After some time, egg shell crackling may be felt while palpating the involved bone[9]. Once infected they become symptomatic causing pain and swelling and patients become aware of the problem. In our case mobility, root resorption of teeth was also seen along with swelling and pain, also the labial bone was completely resorbed by the lesion.

Radiographically, the radicular cyst appears as round unilocular radiolucency at the apex of a non-vital tooth. The margins of a radicular cyst are corticated, continuing with the lamina dura. However, if cysts get infected or are rapidly enlarging then radiopacity of the margins may be absent[3].

Histopathological examination is imperative as many other odontogenic cysts like odontogenic keratocysts and odontogenic tumours such as ameloblastoma etc may show same radiological features as radicular cysts.

On histopathological examination, epithelial lining of radicular cysts is stratified squamous epithelium which may range from 1-50 cell layers. The fluid found in the lumen of a cyst has low concentration of protein and cholesterol clefts known as Rushton bodies with multinucleated giant cells. Acute and chronic inflammatory infiltrate can be seen at subepithelial level. In our case, histopathological finding revealed acute and chronic inflammatory infiltrate without any Rushton bodies[10].

Conversion of cystic lining to dysplastic epithelium is possible in long-standing cases of radicular cysts which may further progress as infiltrating squamous carcinomas. At present, there is no evidence that cyst epithelium is at a high risk of carcinomatous transformation[10].

The most approved treatment procedure for radicular cyst is the endodontically treating or extracting the offending tooth combined with surgical enucleation of a cyst. Although, the decompression technique using needles can be used to reduce the size of the cyst, without enucleation[3].

CONCLUSION

Dental practitioners are the first who encounter and detect pathological lesions that arise asymptomatically. Early detection of the lesion helps in using fewer radical methods of treatment[3]. Hence, routine radiographs of deep caries or pulp inflammation should be taken for early diagnosis.

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FIGURES

Fig.1 showing swelling and redness of attached alveolar mucosa of right central and lateral incisor along with non-vital right central incisor.

Fig 2 showing pus mixed with blood on aspiration of the lesion.

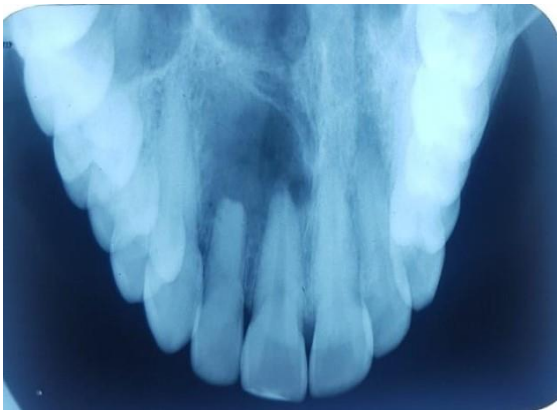

Fig 3 showing Maxillary occlusal topographic view

Fig 4 showing IOPA of cystic lesion

Fig 5 showing raised flap and absence of labial cortical bone

Fig 6 showing placement of bone graft

Fig 7 showing postoperative status of the lesion.

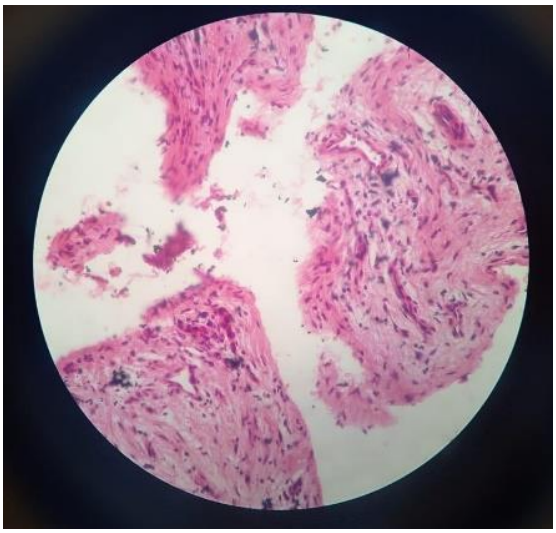

Fig 8 showing histopathological slide of the cystic lining.