

## Radicular cyst involving maxillary sinus–Case report discussing differential diagnosis

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### Abstract

Radicular cysts are commonest pathology of jaw bones, which is odontogenic in origin. Due to delayed diagnosis, some lesions can reach significantly large dimensions and may extend to adjacent anatomic structures. Here, we are presenting a case of a maxillary radicular cyst large enough to involve maxillary sinus. This patient also had multiple periapical pathologies related to carious teeth or remnants of teeth. All the lesions were managed successfully, without recurrence. Differential diagnosis of such a common lesion is very important in view of appropriate management and good clinical response.

**Keywords:** radicular cyst, odontogenic cyst, periapical cyst, jaw cyst

### 1. Introduction

The most prevalent cyst seen in jaw bones are periapical or radicular cysts, with a prevalence of 48.67% [1]. These inflammatory cysts are originating as a sequelae of pulpitis. Since this is one of most common reason for bony swellings in oral cavity, its atypical presentation becomes more pertinent in clinical practise.

The commonest presentation of the disease is a swelling associated with a decayed or discoloured teeth. The reason for this cyst is the proliferation of epithelial rest cells of Malassez in the periodontal ligament that surrounds the tooth, when the pulp tissue becomes necrosed following caries or trauma. Since maxillary anterior teeth are much more prone to trauma, the most common location for radicular cyst is anterior maxilla (60%) [2].

This case report presents an unusual presentation of radicular cyst of posterior maxilla, associated with a decayed tooth. The aim of this article is to help clinicians to form a differential diagnosis of jaw swellings, which can significantly improve the management protocol.

### 2. Case details

A 32 year old male patient presented with a complaint of swelling in the left side of face since 2 weeks. There was a small swelling in the region since 1 year which increased in size 2 weeks back, without pain or bleeding. There was no relevant medical history with no history of chronic medication. History of extraction of teeth 8 years back due to decay and the postoperative period was uneventful. The patient was not having any history of familial diseases or any deleterious oral habits. On clinical examination, he was conscious, oriented and cooperative. Vital signs were within normal limits. No abnormalities were detected in the CVS, CNS, GIT and respiratory systems.

Extra orally, there was a swelling in the left cheek of size 4.5×3.5cm, extending anteriorly from the left ala of nose, posteriorly at the level of outer canthus of left eye.

Superiorly it extends from 0.5cm below the infra-orbital margin to 0.5cm above left corner of mouth, with well-defined and palpable margins. There was no localized rise of temperature, non-tender and was hard in consistency. Surface of the swelling was smooth. There was no bleeding or any discharges on palpation. No visible or palpable pulsations (Fig 1)



**Fig1:** Extraoral view

Intra orally, there was a swelling in the left maxillary vestibule, of size 4.5×3.5cm, extending anteriorly from mesial aspect of 23 to distal aspect of 28 posteriorly. Superior margin was not visible intraorally. Inferiorly it extends upto the mucogingival junction of 23,24,25,26,27 and 28. Margins were well defined except the superior margin. The swelling was non-tender and was hard in consistency except for the fluctuant area in the antero-inferior aspect, in relation to 24. Surface was smooth and colour of the mucosa over the swelling was pale due to stretching without prominent vessels. There were no ulcerations, bleeding or any other discharges, sinus openings or visible/palpable pulsations. Root stumps of 26, 16 and 46 were present and 36 was clinically missing. No mobility of tooth were present (Fig 2).



**Fig 2 :** Intra oral view

### 2.1 Investigations

Vitality testing of teeth showed normal response of 23,24,25,27 and 28 on electric pulp testing. Aspiration yielded yellow coloured fluid containing abundance of shiny granules (cholesterol crystals)(Figure 3).



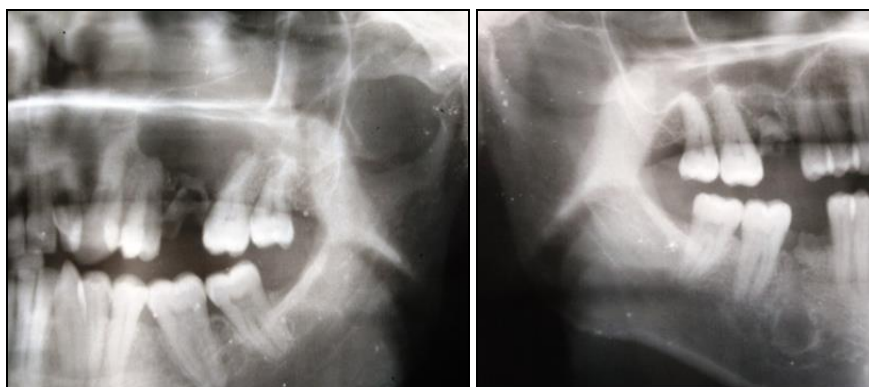
**Fig 3:** Aspirate

Panoramic radiograph (Fig 4&5) showed a radiolucent lesion in the right maxilla in apical relation to 25, 26+ and 27, of size 3.5×2.5 cm, extending from the mesial aspect of 25 to distal aspect of 27 and superiorly 3cm below the infraorbital margin to the apex of 26. The margins were well

defined and corticated in the anterior and superior margins. The lesion was completely radiolucent with no evidence of internal calcifications. Floor of maxillary sinus was lifted superiorly. No evidence root resorption or displacement of teeth. A radiolucent lesion was present in relation to apex of root stump of 16 of size 1×0.8 cm with well defined, corticated margin with radiolucent internal structure. No evidence of calcifications within the lesion. Another radiolucency was seen in the apex of root stump of 46, of size 2 ×1.4 cm with well defined and corticated margins with radiolucent internal structure. No evidence of calcifications within the lesion.



**Fig 4:** Panoramic Radiograph



**Fig 5:** Cropped Panoramic Radiographs

Intra oral periapical radiograph(IOPA) of 26 region showed, radiolucent lesion was not within the confines of the IOPA film. Root stump of 26 with no evidence of lamina dura in the apex.

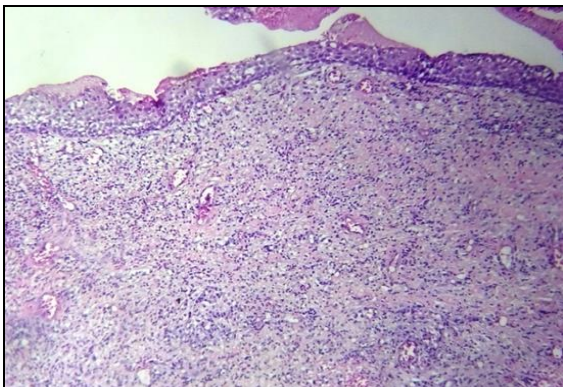
Lamina dura was not visible in the apical 3<sup>rd</sup> of 25 and 27 with normal periodontal ligament space. No root resorption. No evidence of internal calcifications(Fig 6).



**Fig 6:** Intra oral periapical Radiograph of 26 region

After examination and investigations, the lesions were provisionally diagnosed as Periapical cyst in relation to root stump of 26 and 46 and Periapical granuloma in relation to 16.

Histopathological report was suggestive of infected periapical cyst in relation to 26. The cyst was lined by stratified squamous epithelium. Dystrophic calcification, cholesterol clefts with multinucleated giant cells, red blood cells, and areas of hemosiderin pigmentation were present in the wall. The wall of the cyst consists of dense fibrous connective tissue. Often with an inflammatory infiltrate containing lymphocyte variably intermixed with neutrophils, plasma cells, histiocytes, and (rarely) mast cells and eosinophils(Fig 7).



**Fig 7:** Histopathology

**2.2 Final Diagnosis**

- Infected periapical cyst in relation to 26
- Periapical cyst in relation to 46
- Periapical granuloma in relation to 16

Patient underwent enucleation of the cyst along with extraction of the root stump 26. Root stump 16 and 46 were also extracted, followed by curettage. Patient underwent prosthetic rehabilitation and is asymptomatic and under review.

**3. Discussion**

Being the commonest jaw cyst, diagnosing a case of radicular cyst (also called periapical cyst) is not a tedious task. Perhaps, it becomes a clinical challenge when the clinical features becomes atypical or confusing. Every possible differential diagnoses must be considered before doing an extensive surgical procedure. Radicular cysts occur in all tooth bearing areas of jaw, commonly in maxillary anterior region (60% in maxilla and 40% in mandible) [2].

Generally there is no gender predilection, but some available data suggests that 51.5% were seen in men and 48.5% in women. But this difference was insignificant [3].

Clinically this lesion remains unnoticed until it reaches significant size, enough to cause expansion of bony cortices and swelling. It becomes painful once it gets infected secondarily. Maxillary lesions may get enlarged sufficient enough to encroach into maxillary sinus area, reducing its size [3]. Natkin *et al* [4] studied cases of radicular cyst by comparing its clinical, radiographic and histopathological finding to conclude that if the size of the lesion is more than 200 mm<sup>2</sup>, one can confirm possibility of cyst.

Maxillary posterior teeth lesions are most commonly affect maxillary antrum, due to the close proximity of its roots with floor of sinus. Also maxillary lateral incisors can affect sinus when its root have a favourable inclination [5].

**3.1 Formulating differential diagnosis**

The lesion with swelling on left maxilla could be an odontogenic cyst or tumor. Its periapical location, presence of root stump26, presence of swelling only in the buccal vestibule and its hard consistency with fluctuant area, all were suggesting a diagnosis of odontogenic tumor, possibly a periapical cyst. The factor raising suspicion of odontogenic tumor is its large size, but considering an evident focus of inflammation (root stump), and absence of bicortical expansion, smooth surface and without any prominent blood vessels, we could reasonably exclude the diagnosis of a tumor. These findings are based on clinical findings alone.

After radiographic examination, one can identify many lesions in maxilla and mandible. Lesion in 26 region could be Periapical cyst, Odontogenic tumor (Ameloblastoma), or Traumatic bone cyst. Lesions in relation to 16 and 46 may be periapical cyst or periapical granuloma.

**Periapical or Radicular cyst**

- Well defined, corticated radiolucency in the periapical region
- Presence of tooth focus –root stumps
- Radiolucent internal structure

**Ameloblastoma-unilocular**

- Well defined margins
- Mostly in mandible, if in maxilla 3<sup>rd</sup> molar region and extending into sinus and nasal floor
- Uni/multi locular
- Extensive root resorption
- Tooth displacement
- Thinning of cortical plate – leaving an “egg shell” of bone
- Traumatic bone cyst- pulps of the associated teeth are usually vital
- Approximately 90% of traumatic bone cysts occur in the mandible, where they are most frequently seen in the molar, premolar, and incisor regions. If in maxilla- anterior.
- An intact periapical lamina dura is seen in the case of a traumatic bone cyst
- Round to oval, well defined borders, but rarely measures >3cm
- Aspiration is usually fruitless but in some instances yields a serumlike fluid

### **Central giant cell granuloma**

- Common in mandible
- If in maxilla, anterior to cuspid
- Margins usually non corticated
- No displacement or resorption of tooth roots

Many patients can have symptoms associated with sinus involvement, like stuffiness of nose or running nose, but this patients was not having such symptoms. Since the margins of the lesion was correctly delineated in the radiograph, other costly investigations like CT was not carried out. Moreover, histopathological report was conclusive of radicular cyst. Thus we could manage the patient with conventional radiographic views.

### **4. Conclusion**

Radicular cysts are easily manageable lesion, with least chance to recur. In some cases patient will not notice the lesion unless it become very large enough to affect surrounding areas, like maxillary sinus significantly. Such lesions may mimic much severe pathology, and confuse clinician. Hence reaching a diagnosis early will help clinician to avoid unnecessary investigations and management cost.

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