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**Dr. Debanjali Mukherjee**  
M.D.S (Oral Pathology &  
Microbiology), Senior Lecturer,  
Dr. B.R Ambedkar Institute of  
Dental Sciences and Hospital,  
Patna, Bihar, India

## **Radicular cyst involving anterior region of mandible - A case report**

**Dr. Debanjali Mukherjee**

### **Abstract**

Inflammatory jaw cysts arise as a result of epithelial proliferation within an inflammatory focus due to a number of causes (physical, chemical or bacterial injury). Radicular cysts are the most common inflammatory cysts and they arise from the epithelial residues in the periodontal ligament after death and necrosis of the pulp as a result of periapical periodontitis. Radicular cysts (also known as periapical cyst) are found most commonly at the apices of the involved teeth. Most common site of occurrence is anterior maxillary region along with male sex predilection. This report describes a case on a radicular cyst involving anterior mandibular region extending to the body of the mandible occurring in a 30 years old male patient.

**Keywords:** Odontogenic cyst, radicular cyst, mandible

### **Introduction**

About 52% to 68% of all the cysts affecting the human jaw are radicular cysts <sup>[1]</sup>. Incidence rate is highest in third and fourth decade of life with male predilection <sup>[2]</sup>. Although anatomically the periapical cysts occur in all tooth-bearing sites of the jaw but the common site of occurrence is maxilla <sup>[1, 3]</sup>. The epithelial linings of these cysts believed to be derived from the epithelial cell rests of Malassez in the periodontal ligament and thus, the epithelial cell rests are initiated to proliferate by inflammation as a result of necrotic debris and bacterial antigens derived from the dead pulp <sup>[2]</sup>.

Most of the asymptomatic radicular cysts are discovered during radiographic investigations of nonvital teeth. At first the enlargement is bony hard. The swelling exhibits 'springiness' or 'egg shell crackling' as the covering bone becomes very thin due to increasing size of the cyst. Lesion becomes fluctuant when the cyst has completely eroded the bone. Buccal or palatal enlargement is seen in maxillary cyst whereas labial/buccal and only rarely lingual swelling is noted in the mandible. Although there is no clear correlation between infection and symptoms, it is often said that radicular cysts are painless unless infected <sup>[2]</sup>.

Histopathologically, the radicular cyst exhibit a closed pathological cavity, partially or completely lined by non-keratinised stratified squamous epithelium along with chronic inflammatory cell infiltrations <sup>[2]</sup>. Depending upon the size of the cyst, surgical intervention or simple conventional therapy is the treatment of choice for radicular cyst <sup>[4]</sup>.

Here, I am presenting a case of radicular cyst involving mandible of 30 years old otherwise healthy male.

### **Case report**

30-year-old male patient from a semi urban area had reported to a private clinic with a chief complain of mild pain and pus discharge in relation to the right lower anterior tooth region. The patient had pain in the same region 4 months before and had taken medication for that but could not recollect any history of trauma.

The past medical history as well as the family and surgical histories were non contributory. The patient was of average height and weight. Extraoral examination revealed, no obvious swelling or facial asymmetry. There was no sinus or fistula extraorally. Regional lymph nodes were non-enlarged, non-palpable. Intraoral examination revealed, discolored, non vital mandibular lateral incisor of right side [Figure 1]. There was mild swelling and discharging sinus in relation to 42 [Figure 1]. On palpation, there was liberation of pus and dull pain in

**Corresponding Author:**  
**Dr. Debanjali Mukherjee**  
M.D.S (Oral Pathology &  
Microbiology), Senior Lecturer,  
Dr. B.R Ambedkar Institute of  
Dental Sciences and Hospital,  
Patna, Bihar, India

relation to 42 region. Pain on percussion was negative and none of the teeth were mobile. No paraesthesia was noted.

The patient was advised for intraoral periapical radiograph (IOPA X-ray) and orthopantomogram (OPG) for radiological evaluation. The IOPA radiograph showed diffuse periapical radiolucency with sclerotic border in relation to 31,32,41,42 [Figure 2]. The OPG showed a large, well-defined, well corticated, unilocular radiolucency with a sclerotic border in the periapical region of the 32 to 44. There was no evidence of root resorption/displacement. The inferior border of the mandible was intact [Figure 3].

Considering the history, clinical and radiological findings a provisional diagnosis of radicular cyst was made. Differential diagnosis included dentigerous cyst, pindborg tumour, periapical cementoma, traumatic bone cyst, ameloblastoma, odontogenic keratocyst and odontogenic fibroma.

An incisional biopsy was performed under local anesthesia after routine blood evaluation (no significant alteration) and informed consent from the patient, for histopathological evaluation. Microscopic features of the H&E stained section showed the presence of hyperplastic, non-keratinized squamous epithelial lining with intense chronic inflammatory cell infiltration in the underlying fibrovascular connective tissue stroma [Figure 4]. The most striking feature was the proliferation of the lining epithelium in an arcading pattern into the connective tissue wall [Figure 4]. Areas showing haemorrhage were also evident in the connective tissue [Figure 4]. No features of malignancy were found. The overall histopathological features were corroborative to radicular cyst. Therefore, a final diagnosis of "Radicular cyst" was made on the basis of clinical, radiological and histopathological parameters. Based upon the above diagnosis the patient was referred to the department of Oral and Maxillofacial Surgery for further management and treatment.



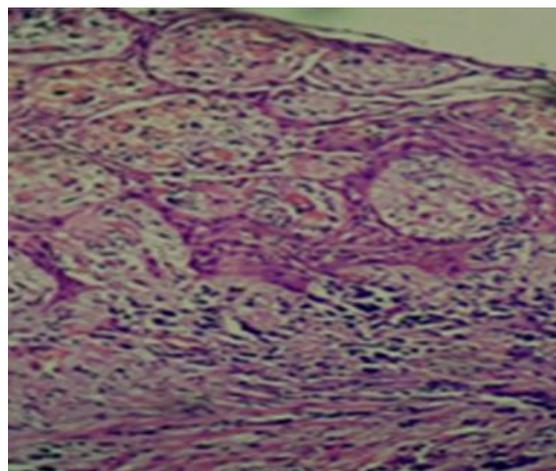
**Fig 1:** Intraoral photograph showing non vital, discolored 42 along with mild swelling and discharging sinus in relation to 42.



**Fig 2:** IOPA radiograph showing diffuse periapical radiolucency with sclerotic border in relation to 31,32,41,42.



**Fig 3:** OPG showing a large, well-defined, well corticated, unilocular radiolucency with a sclerotic border in the periapical region of the 32 to 44 without root resorption/displacement.



**Fig 4:** Photomicrograph showing presence non-keratinized stratified squamous epithelial lining in an arcading pattern into the fibrovascular connective tissue wall with chronic inflammatory cell infiltration and areas of haemorrhage (H & E, 40X).

## Discussion

52%–68% of all jaw cysts and 55% of odontogenic cyst is radicular cyst [5].

The pathogenesis of radicular cyst can be described under three phases: initiation, cyst formation and enlargement [2]. At first, inflammatory proliferation of epithelial cell rests of Malassez in the periodontal ligament occur due to necrotic debris and bacterial antigens derived from the dead pulp. According to a widely accepted theory, in the second phase, the cystic cavity formed by degeneration and death of cells in the centre and lined by the proliferating odontogenic epithelium.

According to Toller [6], the third phase of growth and enlargement are subjected to an osmotic imbalance with the surrounding tissues, due to absence of lymphatic drainage. It was also found that intracystic pressure was inversely proportionate to cyst size, thus increased pressure played a pivotal role in early cyst growth.

Radicular cysts are commonly seen in between 30 to 50 years of age along with a male predilection (M:F 1.6:1) [7]. In the present case, radicular cyst was also seen in a 30 years old male patient involving the anterior mandible, extending to the body.

Radicular cysts are usually asymptomatic and in many cases they are diagnosed accidentally during routine radiographic examination. Clinically, radicular cyst may develops signs and symptoms such as swelling, tooth mobility and displacement of unerupted tooth in long standing cases due to acute exacerbation [8]. Radicular cyst is often presented with a nonvital / discoloured tooth [9]. In the present case, there was mild swelling and discharging sinus in relation to

discolored, non-vital 42.

Radiographically, a radicular cyst presents well-defined unilocular radiolucency located periapical to a tooth with pulp involvement<sup>[5]</sup>. The present case revealed unilocular, extensive radiolucent lesion with well corticated margin.

Histopathologically, radicular cysts are lined by proliferative, nonkeratinized squamous epithelium in an arcading pattern with intense inflammatory infiltrate in the fibrovascular connective tissue. Keratin formation (2% of cases) when present, affects only part of the cyst wall<sup>2</sup>. In this case, the proliferative lining epithelium was in an arcading pattern into the connective tissue wall. Areas of hemorrhage with intense chronic inflammatory cell infiltration were also seen in the underlying fibrovascular connective tissue. The clinical, radiological, and histopathological findings were corroborative to the diagnosis of radicular cyst. Therefore, a final diagnosis of odontogenic keratocyst was made on the basis of clinical, radiological and histopathological parameters.

Multiple treatments modalities for radicular cyst have been proposed. The treatment modalities differ according to the location and size of the lesion, the unity of the bone to the cystic wall, and the closeness of the lesion to the vital structures<sup>[10, 11]</sup>. Nonsurgical endodontic (root canal) therapy is the treatment of choice for localized lesion whereas large lesion needs surgical approach like enucleation, marsupialization or decompression<sup>12</sup>. In our case, the patient was advised for complete enucleation of the cyst to reduce the post-operative complications as patient is of very young age group and reported to the oral surgery department for further management and treatment.

### Conclusion

Radicular cyst being common odontogenic cyst usually goes unnoticed due to its asymptomatic nature and it is diagnosed in most cases during radiographic examination. Proper treatment and long-term follow are recommended as occasionally neoplastic transformations of the epithelial lining of radicular cysts were noted. Careful clinical examination combined with thorough imaging modalities to evaluate the general aspects of the lesions as well as its relationship to adjacent anatomical structures are very important for proper diagnosis. These informations coupled with histopathological confirmation of the diagnosis will allow for the selection of the best treatment plan. Thus, the clinicopathological, diagnostic and treatment modalities of radicular cyst, in general and a lesion involving the mandible, in particular is discussed herewith.

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