

Multilocular Radicular Cyst: A Diagnostic Impasse

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Abstract

Radicular cyst is the most common odontogenic cyst of inflammatory origin. It arises from the residues of epithelium present in the periodontal ligament stimulating the Malassez epithelial cell rests causing periapical periodontitis & necrosis of the dental pulp. Their incidence is highest in adolescence being predominant in males. Anatomically the periapical cysts occur in all tooth-bearing zones of the jaw usually seen in the maxillary than the mandibular region. Many radicular cysts are symptomless until secondarily infected. Radiographically, it presents as a well-defined unilocular radiolucency discovered usually when periapical radiographs are taken of teeth with non-vital pulps. While multilocular radicular cysts have also been

reported, which are particularly rare and very few cases reported till date. The present case report boons a rare case of immense multilocular radicular cysts of the mandibular posterior expanse aping an aggressive cyst or benign tumor, bestowing a diagnostic difficulty.

Keywords

Radicular cyst, Multilocular, inflammatory, dental cyst.

Introduction

Radicular cyst can be mentioned with several substitutes like as dental cyst, periapical cyst, apical periodontal cyst, or root-end cyst.¹ Radicular cyst is the utmost shared odontogenic cyst comprising of 52% to 68% of all the cysts affecting the human jaw, but are

considered to be rare in primary dentition, embracing only 0.5% to 3.3%.² They progress as a result of inflammatory processes within the root canal system of a tooth, leading to pulpal necrosis. Their prevalence in maxilla is about 60% as compared to mandible.³

Radicular cysts are not generally observed as they are usually asymptomatic and are left undiscovered; until they get detected accidentally in routine radiographic investigation.⁴ Certain extensive lesions may endure an acute exacerbation of the cystic lesion leading to signs and symptoms like swelling, tooth mobility and displacement of unerupted teeth. Conclusive diagnosis must be based upon the clinical, radiographic, and histological appraisal.^{3,5}

The treatment of radicular cysts includes conventional root canal approach with a decompression when lesion is localized or surgical treatment like enucleation or marsupialization when lesion is large.⁶

Case Report

A 24 year-old-male patient reported to the outpatient Department of Oral Medicine & Radiology with a chief complaint of swelling on the right lower side of face since 3-4 months. As stated by the patient, it was sudden in onset & gradually progressed to the present size. There was no history of pain or other associated symptoms. Medical, past dental and family history were non-contributory. Patient had a habit history of tobacco chewing since six months with a frequency of one packet/day.

On extraoral examination, a diffuse swelling was present on the right lower third of the face (Figure 1A&B) measuring about 3x4 cm in its greatest dimension, extending antero-posteriorly from two centimeter posterior to the corner of mouth to one centimeter in front of tragus & supero-inferiorly from one centimeter below ala tragus line to half centimeter

superior to lower border of mandible. The overlying skin appeared to be normal. On palpation it was non tender, hard in consistency with no local rise in temperature.

Intraoral examination revealed a well-demarcated swelling on the right buccal vestibule i.r.t. 44, 45, 46, & 47, measuring about 2x3 cm extending from distal of 44 to distal of 47 antero-posteriorly and from marginal gingiva to vestibular area supero-inferiorly (Figure 1C). The overlying mucosa was smooth with normal color. On palpation, it was non tender, hard in the periphery, firm to soft in the center with cortical expansion, non-mobile, and non-compressible. 46 tooth was found to be grossly decayed.

Under Investigations, Fine needle aspiration cytology was performed and 0.35 ml of straw color fluid was aspirated. Based on history and clinical findings, provisional diagnosis of radicular cyst of the right mandibular region with a differential diagnosis of Ameloblastoma was given.

Intraoral periapical radiograph revealed well-defined multilocular radiolucency with sclerotic border extending from apical region of 45, 46, 47. Root stump of 46 showed loss of laminadura i.r.t 45, 46, 47 (Figure 1D&E). Occlusal radiograph revealed a multilocular radiolucency with expansion of buccal cortical plate (Figure 1F). The Orthopantomograph showed a solitary, large, well-defined multilocular radiolucency present on the right body of mandible measuring about 4x5 cm, extending antero-posteriorly from distal of 44 to distal of 48 & supero-inferiorly from interdental area of 46, 47 to 0.5cm superior to lower border of mandible. The mandibular canal was obliterated inferiorly, with distal displacement of 46 (Figure 2A). Based on the radiological findings, the radiographic diagnosis was given as Ameloblastoma. The differential diagnosis

included were odontogenic keratocyst, aneurysmal bone cyst.

Incisional biopsy was performed and the specimen was submitted for the histopathological examination which revealed nonkeratinized stratified squamous arcading epithelial lining with inflammatory cell infiltration in the connective tissue stroma suggestive of radicular cyst (Figure 2B).

Based on history, clinical, radiographic, and histopathologic examination, the final diagnosis was made as Radicular cyst in relation to 46. Under differential diagnosis, Ameloblastoma, OKC and Aneurysmal bone cyst were considered. The patient was referred to Department of Oral and Maxillofacial Surgery where enucleation of the cyst along with extraction of 46 was done under local anesthesia. The patient was followed up for one year post operatively, and no recurrence was observed (Figure 2C).

Discussion

The word, 'cyst' comes from the Greek word, 'Kystis', meaning, 'sac or bladder'. A cyst is defined as "a pathological cavity having a fluid, semi fluid or gaseous contents and which is not created by the accumulation of pus".⁷ Radicular cyst is the 2nd utmost common pulpopariapical entity.⁸

Radicular cyst is an epithelial lined odontogenic, slow growing cyst of inflammatory origin, which can be defined as "a cyst arising from the epithelial residues (rests of Malassez) in the periodontal ligament as a consequence of inflammation, usually following the death with necrosis of the dental pulp".^{1, 5} They arise from stimulation of epithelial remnants proliferation, by an inflammatory process which instigates from pulpal necrosis of a non-vital tooth.⁹ The expected history arises with a non-vital tooth which remains in situ, long enough to develop chronic periapical pathosis.¹⁰

A radicular cyst also known as periapical cyst is usually associated with apex of carious, non-vital, discolored, or broken tooth and commonly occurs in the maxillary anterior region. Most frequently seen in between 30th and 50th year of age with male predominance.^{3,7}

In the present case, the cyst was asymptomatic with noticeable swelling extra orally, which is similar to that reported by Shear M, et al.,¹¹ that radicular cyst is the most common cause for a slow enlargement of the jaw. They are painless unless infected secondarily. The expansion is at first bony hard, but due to the increase in size, the cyst exhibits springiness and egg shell crackling. In cases, where the outer cortex is lost the swelling becomes rubbery and fluctuant.¹² It may cause tooth mobility, and displacement of unerupted tooth, root resorption of the affected tooth.¹⁰

Radicular cyst clinically displays a buccal/palatal cortical plate extension in maxilla whereas in mandible it is usually the buccal and rarely expansion of the lingual plate,⁸ similar to the case reported here which showed on buccal cortical expansion. At first, the enlargement is bony hard, but as the cyst increases in size, the bony covering becomes very thin, and the swelling exhibits springiness and becomes fluctuant when the cyst has completely eroded the bone.⁹

The radicular cyst is generally symptomless and noticed incidentally on radiographs while exploring for other diseases.^{12, 13} Radiographically, this cyst appears as a well-defined unilocular radiolucency located periapical to a tooth with pulp involvement with dental caries, the size of which should be over 2 cm and should be surrounded by radio-opaque sclerotic border, which may be lost in cases of secondary infection. In the present case, the radiographic appearance was that of a

multilocular radiolucency, similar to that reported by Shivhare P, et al,¹² that apart from the usual unilocular radiolucency, there has been very few cases reported of radicular cyst with multi-locular radiolucency.¹⁴⁻¹⁶ (Table 1)

Nearly all radicular cysts are lined completely or in the fragment by non-keratinized stratified squamous hyperplastic epithelium arcading pattern of rete ridges or is sluggish and moderately methodical with a certain mark of differentiation. The inflammatory cell penetrates in the thriving epithelial linings comprising largely of

polymorphonuclear leukocytes with plasma cells and few macrophages.^{17, 18}

The treatment option depends on several factors, size and location of the cyst, veracity of the wall, and vicinity of the cyst with vital structures. Nevertheless, no matter what choice it might be, the treatment option should be kept as conservative as possible. Several treatment modalities are available for radicular cysts such as endodontic management; surgical extraction of the aberrant tooth, enucleation and marsupialization. In the present case, surgical enucleation was done along with the removal of the insulting teeth.^{19, 20}

Author	Year	Age	Sex	Site	Symptoms	Radiographic features
Ambrecht EC, et al. ¹⁴	1952	56	Female	Left posterior mandible	Swelling with moderate pain	Multilocular radiolucency
Narsapur SA, et al. ²¹	2012	9	Male	Left posterior mandible	Painless swelling	Bilocular radiolucency
Krishnamurthy V, et al. ¹⁵	2013	52	Male	Mandibular anterior	Asymptomatic slow growing, swelling	Multilocular radiolucency
Shivhare P ¹²	2016	21	Male	Left posterior mandible	Swelling	Multilocular radiolucency
Tootla ²²	2017	29	Female	Mandibular anterior	Swelling	Multilocular radiolucency
Akari N, et al., ¹⁶	2019	64	Male	Left anterior to posterior mandible	Referred with bilocular radiolucency	Bilocular radiolucency
Present case		24	Male	Mandibular right posterior region	Swelling	Multilocular radiolucency

Table 1: Comparing the findings of the present case with previous published literature in chronological orders.

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Tables

Table 1: Comparing the findings of the present case with previous published literature in chronological orders.

Figure Legends

Figure 1: Extraoral Front (A) and neck (B) views of the patient showing facial asymmetry due to swelling over right lower third of face. Intraorally (C) a diffuse obliteration of right lower buccal vestibule associated with a first molar root stumps can be appreciated. Radiographs like IOPAR (D & E) showing multilocular radiolucency with sclerotic border whereas occlusal radiograph (F) showing buccal cortical plate expansion extending from apical region of 45, 46, & 47.



Figure 2: A preoperative Orthopantomograph (A) showing a multilocular radiolucency with sclerotic margin periapical to 45, 46 and 47. Histopathological photomicrograph (B) showing an H&E stained tissue section with Nonkeratinized stratified squamous epithelial proliferating in an arcading pattern underlying inflammatory cell infiltration in the connective tissue stroma. Post-operative Orthopantomograph (C) showing bone regeneration after 6 months.

