

## CASE REPORT



# Asymptomatic painless swelling in anterior maxilla - A clue for the diagnosis of radicular cyst: A case report

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## Abstract

The most frequently occurring odontogenic cyst of the jaw is the radicular cyst which occurs as a well-defined radiolucency around the apex of the tooth involved, more common in maxilla than mandible. Odontogenic cysts can be either developmental or inflammatory in origin. The most common inflammatory odontogenic cyst is the apical periodontal cyst (dental root end cyst) or what is most commonly known as the radicular cyst. Although non-surgical is the trending treatment of choice in management of a periapical cyst, surgical approach is recommended in extensive periapical lesions. The present case report was an asymptomatic painless swelling on the roof of hard palate for 12 months. The cyst was managed by enucleation followed by apicoectomy and orthograde obturation of the offending teeth. For definitive diagnosis of radicular cyst of maxilla which is extending extensively, stepwise clinical, radiological, and laboratory evaluation are essential.

**Keywords:** Apical periodontal cyst, enucleation, radicular cyst

## Introduction

Odontogenic cysts can be either developmental or inflammatory in origin. The most common inflammatory odontogenic cyst is the apical periodontal cyst (APC) (dental root end cyst) or what is most commonly known as the radicular cyst.<sup>[1-2]</sup> They originate from the proliferation of the remnants of Hertwig's epithelial root sheath.<sup>[3]</sup>

## Case Report

A male patient, aged 30 years, was referred to the Department of Periodontology from the Department of ear, nose, and throat (JSS Medical College) for the management of a painless swelling in the right anterior maxillary region.

The patient reported with a chief complaint of a painless swelling on the right side of the roof of the mouth for 1 year. The patient gave a history trauma 6 years back; there was noticeable palatal swelling 1 year back; as a small pea-sized swelling which gradually increased to the present size – almond-shaped [Figure 1]. The patient was asymptomatic otherwise. On intraoral examination, there were discolored teeth 11 with an asymptomatic diffuse palatal swelling on the right side of the

hard palate extending from 11 anteriorly to 15 posteriorly. The swelling measured about 2 cm × 1.5 cm in its largest dimension. No evidence of any surface changes/bleeding/sinus opening/pus discharge. On palpation, the swelling was non-tender, tennis ball in consistency, fluctuant, and non-pulsatile with no mobility of the involved teeth.

## Investigations

The patient was advised for orthopantomogram (OPG), intraoral periapical radiograph, maxillary occlusal radiograph, routine laboratory investigations, and FNAC of the lesion.

OPG and maxillary occlusal radiograph showed a well-defined radiolucency with corticated margins extending from 11 to 15 measuring (4 cm × 3 cm) in its largest dimension [Figure 2a and b]. EPT (Electric pulp tester) was negative w.r.t. 11 and 12. Intraoral periapical radiograph w.r.t. 11 showed loss of lamina dura, external root resorption, and a well-defined periapical radiolucency measuring more than 2 cm in diameter. The lesion had a corticated margin (approximately 4 cm × 3 cm in its largest diameter). The posterior distal margin was ill-defined [Figure 2a].

Routine laboratory investigations were within normal limits. Fine-needle aspiration cytology was done under local anesthesia,

using 18 gauge needle to analyze the cyst content. A yellow color fluid was collected on which cytochemical evaluation was performed which reported numerous acute and chronic inflammatory cells, suggestive of an inflammatory cystic lesion.

The provisional diagnosis from these above findings was radicular cyst secondary to trauma in relation to the right maxillary incisors.

Differential diagnosis was as follows:

- Nasopalatine cyst
- Globulomaxillary cyst
- Dentigerous cyst
- Odontogenic keratocyst.

#### Treatment plan

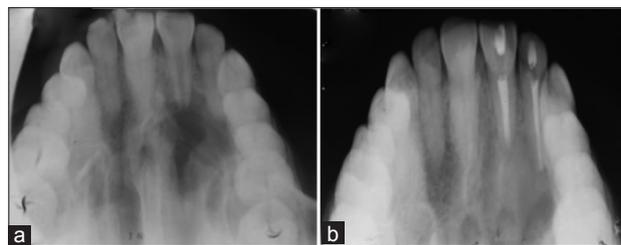
- Endodontic therapy w.r.t 11 and 12
- Surgical management of the cyst: Cyst enucleation and apicoectomy w.r.t. 11 and 12
- For the discoloration w.r.t 11: Walking bleaching protocol followed by composite buildup or a full coverage restoration.

#### Endodontic phase

The patient was referred to the department of conservative dentistry and endodontics for endodontic therapy w.r.t. of 11 and 12. Access



**Figure 1:** Clinical photograph showing swelling on the right side of palate extending to midline



**Figure 2:** (a) Pre-operative occlusogram showing well-defined radiolucency around periapex of 11 and 12, (b) post-operative 12-month occlusal X-ray showing new bone formation

opening, pulp extirpation, cleaning, and shaping of the root canal were done using normal saline, chlorhexidine, and EDTA for disinfection followed by calcium hydroxide as an intracanal medicament. After 1 week, triple antibiotic paste containing metronidazole, clindamycin, and ciprofloxacin was placed.

Subsequently, the root canals were obturated with gutta-percha using lateral and vertical compaction.

#### Periodontal phase

A palatal and labial mucoperiosteal flap was reflected and enucleation of cyst was done. Apicoectomy and retrograde root end filling for maxillary 11 and 12 was done with biodentin to obtain an apical seal [Figure 3a and 3b].

##### *Biodentin*<sup>[4]</sup>

- Biodentin a novel biomaterial introduced in 2010 is tricalcium silicate ( $\text{Ca}_3\text{SiO}_5$ )-based inorganic restorative material also known as “Bioactive dentin substitute”
- Faster setting, more biocompatible and has excellent sealing ability (low marginal leakage) compared to MTA, but the major disadvantage is less radiopaque than MTA.

After thorough irrigation of the bony cavity and achieving hemostasis, the defect was grafted with platelet-rich concentrate and osseograft bone graft to expedite faster periapical healing. Using 20 ml of patient’s own blood, autologous platelet-rich concentrate was prepared in a centrifuge at 3000 rpm for 10 min (Remi 8C Lab centrifuge) [Figure 4].

##### *Platelet-rich fibrin*<sup>[5]</sup>

- It is a 2<sup>nd</sup> generation platelet concentrate developed by Choukroun *et al.* in 2001.
- It contains a fibrin polymerized matrix in a specific structure with the incorporation of platelets, leukocytes, cytokines, growth factors, and circulating stem cells.
- It has been used extensively in combination with bone grafts or alone in periodontal regeneration. Growth factors present in the concentrate platelets initiate osteoinduction and also aid in soft tissue healing.

Before sending the cyst lining for histopathological examination, the defect was closed primarily.

#### Histopathology

- Hematoxylin and eosin stained section revealed cystic cavity lined by non-keratinized stratified squamous epithelium and connective tissue capsule.
- Stroma consists of collagen bundles interspersed with fibroblasts, intense chronic inflammation, giant cells, and extravasated RBCs.

Correlation of histopathological and the clinical findings confirmed the diagnosis of “radicular cyst.”

#### Follow-up

- The patient was asymptomatic at 6 months and 1-year follow-up with no signs of recurrence. Radiographic examination of

the surgical site showed normal healing of the bone defect [Figures 2b and 5].

- The patient was referred back to the department of conservative dentistry and endodontics for the esthetic rehabilitation of 11 and 12.

## Discussion

Inflammatory jaw cysts comprise a group of odontogenic lesions. Radicular cysts are diagnosed either during a routine radiographic examination or following their acute exacerbation.<sup>[6]</sup> Prevalence



**Figure 3:** (a) Palatal mucoperiosteum reflected showing huge palatal defect after enucleation of the cyst, (b) enucleated mass of the cyst removed in toto sent for biopsy



**Figure 4:** Platelet-rich fibrin mixed with osseograft xenogenic bone graft and placed in defect



**Figure 5:** Post-operative healing of the palate after 12 months

of the radicular cysts in the maxilla is 60% as compared with mandible and is associated with buccal or palatal enlargement, i.e., due to relatively thin and cancellous nature of the maxillary bone.<sup>[2]</sup> Since these cysts form at the root apex, it is also called as an APC. It may be associated with any tooth, commonly involving maxillary anterior teeth. Rarely affects the primary dentition. The location of the maxillary anterior teeth makes them more prone to trauma and subsequent necrosis of pulp. The highest prevalence is observed in the 3<sup>rd</sup>–6<sup>th</sup> decade of life and is more commonly seen in males.<sup>[1]</sup> History of trauma 6 years back, causing pulp necrosis of 11 was the most probable etiological agent for the radicular cyst.

Radicular cysts grow slowly and lead to mobility, root resorption, and displacement of teeth. Once infected, they may lead to pain and swelling and patients become aware of the problem.<sup>[7]</sup> In our case, no mobility or displacement of teeth was seen despite the presence of a large chronic infected cystic lesion.

Radiographically, the radicular cyst is observed as a round- or pear-shaped unilocular radiolucency at the apex of a non-vital tooth. The margin of a radicular cyst is radiopaque with hyperostotic borders, which continues with the lamina dura. However, in infected or rapidly enlarging cysts, the radiopaque margin may not be present. The chronic radicular cyst may result in the resorption of offending tooth roots.<sup>[8]</sup>

Our case had a clear radiopaque border and root resorption was evident with 11, which was helpful in the provisional diagnosis of radicular cyst. In extensive cases, radiographs alone may not be sufficient to show the full extent of the lesions, and advanced imaging may be needed. Cone beam computed tomography (CT) or CT would have been a more appropriate diagnostic tool for our case, but due to financial reasons, it was excluded. Hence, routine OPG, intraoral periapical radiograph, maxillary occlusal radiograph, and routine laboratory investigations were used.

Histopathologically, radicular cysts are lined completely or in part by stratified squamous epithelium 1–50 cell layers thick. The lumen of a cyst contains fluid with a low concentration of protein and collection of cholesterol clefts (Rushton bodies) with multinucleated giant cells. Different intensities of acute and chronic inflammatory infiltrate are present.<sup>[9]</sup> In our case, histopathological finding revealed acute and chronic inflammatory infiltrate without any Rushton bodies.

The treatment of a radicular cyst is still under debate and many professionals opt for the conservative treatment approach which involves only endodontic treatment. However, in extensive lesions, only endodontic therapy is insufficient and it should be associated with decompression, marsupialization, or enucleation. Some authors advocate that suspected radicular cysts must be totally enucleated with the extraction of the offending tooth to remove all epithelial remnants. In our case, endodontic treatment of the offending teeth followed by enucleation of radicular cyst substantially reduces the microbial load from the root canal and prevents reinfection by orthograde filling.

## Conclusion

- Radicular cyst remains an enigma to the dental surgeon until the lesion is extensive with clinical signs and symptoms suggestive of the same. The present case report was managed successfully by endodontic therapy with an emphasis on thorough biomechanical preparation, disinfection, and three-dimensional obturation of the root canal system which was followed by surgical enucleation.
- Taking into account, the patient's apprehension regarding the swelling and also the lesions size and extent a surgical procedure opted under local anesthesia.

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