



## Diagnosis, Management, and Follow-Up of an Oral Radicular Cyst: A Case Report

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**ABSTRACT-** This case report presents the diagnosis, management, and follow-up of an oral radicular cyst in a 19-year-old male. The patient, presenting with pain and pus discharge from the upper front teeth, was diagnosed with a radicular cyst through clinical and radiographic examination. The cyst was associated with a history of trauma and root canal treatment. Treatment included cyst decompression, followed by enucleation and primary closure, using Carnoy's solution to prevent recurrence. Histopathological analysis confirmed the diagnosis. The patient showed favourable results with no recurrence at a four-month follow-up. This case highlights the importance of early detection, appropriate treatment, and monitoring of radicular cysts in clinical practice.

**KEYWORDS-** Radicular cyst, Odontogenic cyst, Enucleation, Decompression

### I. INTRODUCTION-

Odontogenic cysts are commonly classified into two main categories: developmental and inflammatory, based on their etiopathogenesis. Among inflammatory odontogenic cysts, the radicular and inflammatory collateral cyst are noteworthy according to the WHO 2022 Classification of odontogenic cysts. Radicular cysts, which are the most prevalent type of jaw cysts, arise from the epithelial remnants of Malassez in the periodontal ligaments as a result of inflammation. They typically develop at the apex of a non-vital tooth, reflecting the inflammatory process associated with pulpal necrosis. Studies indicate that radicular cysts account for approximately 52% to 68% of all cystic lesions in the human jaw [1][2][3].

These cysts are often asymptomatic and may go unnoticed until identified through routine radiographic examinations. However, in some cases, chronic lesions can lead to acute exacerbations, presenting with symptoms such as swelling, pain, and pus discharge [4][5]. Radiographically, radicular cysts in the maxilla

may show expansion of the buccal and palatal cortical plates, whereas in the mandible, there is typically an enlargement of the buccal cortical plate, with lingual expansion being rare [6][7].

Various treatment options exist for managing radicular cysts, including both surgical and non-surgical approaches. This report focuses on the surgical management of a radicular cyst, followed by root canal treatment, illustrating a comprehensive approach to addressing this common odontogenic condition [8].

### II. CASE HISTORY-

A 19-year-old male presented to the oral and maxillofacial surgery department with a primary complaint of pain and pus discharge from the gums in the upper front tooth region, persisting for the past two weeks. The patient reported a history of trauma to the maxillary anterior area, which necessitated root canal treatment (RCT) for the affected teeth. Upon clinical examination, no extraoral abnormalities were detected.





Fig 1-4- Extraoral manifestations of the patient

However, intraoral assessment revealed discoloration of tooth 11, indicative of internal tooth resorption (characterized by a pink appearance), along with a sinus opening in the area of tooth 21. Radiographic imaging demonstrated a well-defined radiolucent lesion involving teeth 12, 11, and 21, with associated root resorption noted.



Fig 5-7- Intraoral examination



Fig 8- Radiographic findings



Based on these findings, a provisional diagnosis of a radicular or periapical cyst was established. To alleviate intra-cystic pressure, a decompression procedure was planned. The cystic specimen obtained was subsequently sent for histopathological analysis. The H & E stained sections examined showed a cystic lumen and fibro cellular capsule showing dense inflammatory infiltrate comprising of lymphocytes and plasma cells. Capsule also showed dense collagen fibre bundles and proliferating endothelium lined blood vessels. Russel bodies, bony trabeculae and neurovascular bundles were also noted. The diagnosis of a radicular cyst was confirmed.



Fig 9- Cyst fluid aspirate



Fig 10: Cystic cavity after decompression

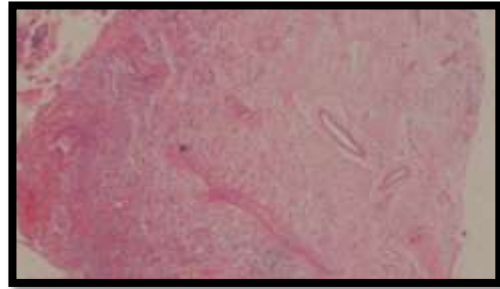


Fig 11- Histopathological examination

An obturator was provided to facilitate re-epithelialization of the surgical site.



Fig 12- Obturator

After a four-month interval, the patient was scheduled for enucleation as a definitive treatment approach. The cyst, along with its lining, was meticulously excised en bloc through a cleavage plane created between the bone and the cystic lining. Adjunctive therapy using Carnoy's solution was also employed to minimize the risk of recurrence. Primary closure of the surgical site was achieved.





Fig 13-17- Enucleation followed by primary closure

The patient continues to be monitored through regular follow-up appointments, and as of now, there have been no signs of recurrence.

### III. DISCUSSION

Odontogenic cysts are a diverse group of lesions that arise from the tissues involved in tooth development, primarily categorized into developmental and inflammatory types. Among these, radicular cysts are the most common, representing a significant clinical concern in dentistry due to their association with non-vital teeth and potential for causing local complications.

#### Etiology and Pathogenesis

Radicular cysts typically develop in response to chronic inflammation stemming from pulp necrosis, usually following caries or trauma. They originate from the epithelial remnants of Malassez in the periodontal ligament, which proliferate due to the inflammatory mediators released from the necrotic pulp [9]. The cystic formation is characterized by a lumen filled with fluid or semi-solid material, surrounded by a fibrous capsule [2].

#### Prevalence and Diagnosis

Radicular cysts account for approximately 52% to 68% of all odontogenic cystic lesions, making them the most prevalent type encountered in clinical practice [10]. They are often asymptomatic and discovered incidentally during routine radiographic examinations. On imaging, radicular cysts typically present as well-defined radiolucent areas at the apex of the affected tooth, with a potential for cortical expansion of the surrounding bone [4].

#### Clinical Manifestations

While many radicular cysts remain asymptomatic, some can lead to significant clinical symptoms, particularly if they become infected or are subjected to acute exacerbations. These acute presentations can include swelling, pain, and purulent discharge, which necessitate prompt clinical intervention [5]. In the maxilla, radicular cysts may cause expansion of both buccal and palatal cortical plates, while in the mandible, enlargement is often localized to the buccal cortical plate [6].

#### Treatment Approaches

Management of radicular cysts involves both surgical and non-surgical treatment options. Non-surgical management typically includes root canal therapy aimed at addressing the underlying



cause of pulp necrosis and reducing inflammation. However, if the cyst is large or symptomatic, surgical intervention may be warranted. Surgical options include decompression which releases the intracystic pressure and is followed by a more procedure of enucleation of the cyst, which involves complete removal of the cyst and its lining [11].

Long-term outcomes following treatment are generally favorable, with studies indicating a high rate of resolution after appropriate management. Nevertheless, recurrence can occur, emphasizing the need for thorough follow-up and monitoring post-treatment [12].

#### IV. CONCLUSION-

Radicular cysts represent a significant aspect of odontogenic pathology, predominantly arising from chronic inflammation related to non-vital teeth. Their prevalence, often asymptomatic nature, and potential for acute complications necessitate vigilant diagnosis and management. Treatment options, ranging from non-surgical root canal therapy to surgical interventions like decompression and enucleation, should be tailored to the cyst's size and symptoms. Successful outcomes rely on comprehensive follow-up care to monitor for recurrence. Understanding the pathophysiology, clinical manifestations, diagnostic processes, and treatment strategies for radicular cysts is essential for improving patient outcomes and ensuring effective dental practice.

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