





MAXILLARY GIANT RADICULAR CYST: A CASE PRESENTATION AND MANAGEMENT

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ABSTRACT

Objectives: Radicular cysts are the most frequent odontogenic cystic lesions, they are inflammatory cysts that involve the apex of affected tooth and appear as well-defined radiolucencies. Most radicular cysts are small, but they can grow quite large due to their capacity for significant expansion, invasion of adjacent tissues, and rapid growth. They also have a high recurrence rate. We present here a rare case of a giant maxillary radicular cyst in a 60-year-old patient, aiming to highlight the clinical and radiological aspects, as well as the importance of enucleation with extraction of the offending tooth/teeth in the surgical management of these cysts. **Methods:** A 60-year-old male patient presented with an extensive involving the left anterior area of the maxilla. The cone-beam computed tomography (CBCT) image suggested the presence of an odontogenic cyst at the size of 50 mm × 30 mm in the affected side. For treatment, an enucleation of the cyst, along with the extraction of the association tooth, was performed. **Results:** The diagnosis of radicular cyst was established on the resected specimen. There were no signs of recurrence two years following the surgery. **Conclusions:** Imaging plays a crucial role in accurately diagnosing and assessing the extent of the cyst. Surgical treatment primarily relies on enucleation with extraction of the offending tooth which is essential for effective management and to minimize recurrence.

KEYWORDS: radicular cyst, maxilla, giant lesion, enucleation.

INTRODUCTION

Inflammatory odontogenic cysts consist of radicular cysts and lateral periodontal cysts. Radicular cysts (also known as apical periodontal cysts or dental root end cysts) are the most prevalent inflammatory odontogenic cysts found in the tooth-bearing regions of the jaws ^[1]. They arise from epithelial rests of Malassez in the periodontal ligaments as a result of inflammation ^[2].

The development of the cyst begins with pulpal necrosis, which is subsequently followed by a periapical inflammatory reaction. Most radicular cysts are small and are often found incidentally during radiographic examinations but they can grow to a considerable size, leading to the displacement of

nearby structures. The aim of this study is to highlight the usefulness of oral radiology in determining the exact position and the extension of giant cystic lesions, along with the significance of enucleation and the extraction of the affected tooth/teeth in their surgical management.

MATERIALS AND METHODS

For the purposes of our study, a clinical case with maxillary giant radicular cyst is being presented. The patient was referred to the Department of Oral and Maxillofacial Surgery of the University Hospital Center Hassan II with a painless swelling in the left anterior area of the maxilla. Through the patient's radiological examination with cone-beam computed tomography (CBCT); the diagnosis of giant radicular cyst was suggested.

RESULTS – CASE PRESENTATION

A 60-year-old male patient was referred to the Department of Oral and Maxillofacial Surgery of the University Hospital Center Hassan II with

a 8-month history of a painless vestibular mass in the left anterior area of the maxilla. On intra oral examination, a well-defined swelling was present on the buccal vestibule of the anterior maxilla, additionally, teeth 11, 12 and 21 were clinically missing and there was caries in relation to 13, 14, 22 and 23, which was non-vital (**Figure 1, A**). On palpation, the lesion was soft and fluid in consistency. The palate was devoid of any swelling vital (**Figure 1, B**). Oral hygiene was poor exhibiting grade 2 stains and calculus.



Figure 1 (intra oral picture; A: vestibular mass in the left anterior area of the maxilla; B: The palate was devoid of any swelling.)

Radiographically, cone-beam computed tomography (CBCT) showed a well-defined homogeneous radiolucency of size 50 cm × 30 cm in the left anterior area of the maxilla extending from the right canine to the left second molar tooth (**Figure 2**). Based on the clinical and radiographic findings, a provisional diagnosis of radicular cysts was made. Under general anesthesia, the maxillary lesion was accessed by elevating the mucoperiosteal flap for the planned enucleation of the cyst in the maxillary body, along with the extraction of the affected teeth (**Figure 3, 4**). The flap was closed using 3-0 vicryl sutures. The postoperative healing was uncomplicated.



Figure 2 (A cone-beam computed tomography (CBCT) showed a radiolucency in the left anterior area of the maxilla.)

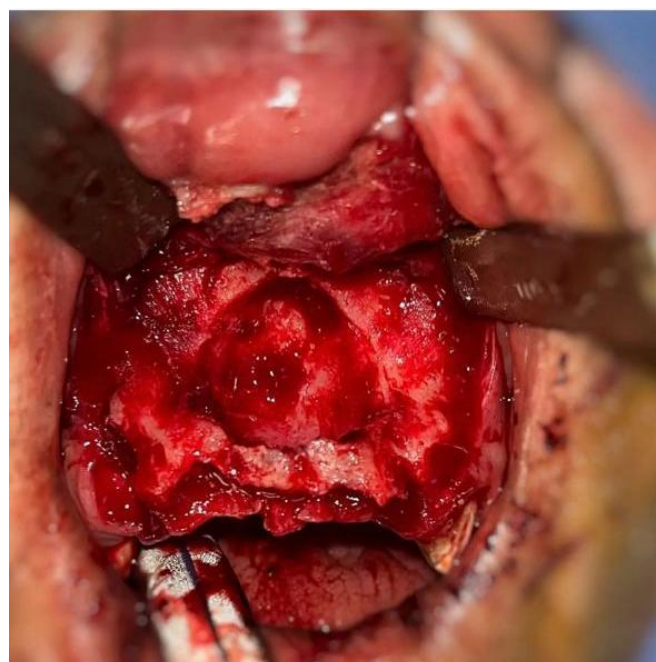


Figure 3 (cystic cavity after enucleation.)

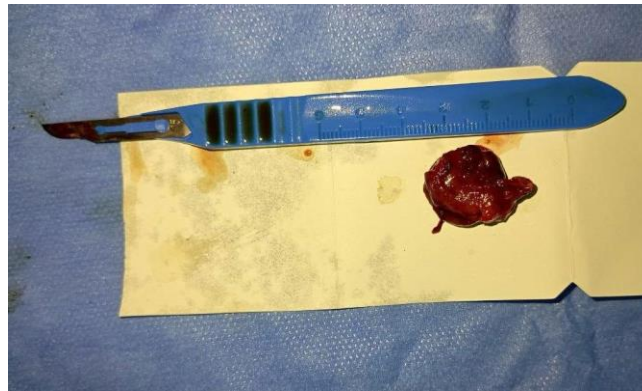


Figure 4 (The surgical specimen.)

The surgical specimen was sent for histopathological examination. The histopathological analysis confirmed the diagnosis of a radicular cyst, the 15-day postsurgical follow-up revealed a notable reduction in the size of swelling and rapid healing of the surgical site (**Figure 5**). At the six-month follow-up, no recurrence was noted.



Figure 5 (the 15-day postsurgical follow-up revealed a notable reduction in the size of swelling and rapid healing of the surgical site.)

DISCUSSION

Radicular cysts are among the most prevalent and significant cystic lesions in the jaw, representing approximately 52% to 68% of all such cases [3, 4]. Radicular cysts are more commonly found in individuals between the third and fifth decades of life, with a higher prevalence in males. They are also more frequently located in the anterior maxilla compared to other areas of the oral cavity [5]. They develop from epithelial residues in the periodontal ligament as a result of apical periodontitis, which occurs after the death and necrosis of the dental pulp, the development of radicular cysts involves three distinct phases: the initiation phase, the cyst formation phase, and the enlargement phase [6].

Clinically, radicular cysts present as buccal or palatal swelling in the maxilla and buccal swelling in the mandible. Initially, they appear as a hard-bony enlargement, but as they grow, bone resorption occurs, leading to thinning. This results in a characteristic springiness or "egg shell" crackling sensation, and the swelling becomes fluctuant [7]. Most radicular cysts are small, typically measuring between 0.5 and

1.5 cm. However, in the maxilla, a cyst associated with molars or premolars can sometimes grow large enough to encroach upon nearly the entire sinus, resulting in a noticeably thin residual sinus space [8]. On radiographic images, a radicular cyst appears as a unilocular radiolucency that is either round or pear-shaped, situated at the apex of a non-vital tooth. The margins of the cyst are radiopaque and have hyperostotic borders; however, in cases of infected or rapidly enlarging cysts, the radiopaque margin may be absent.

Other odontogenic cysts, such as dentigerous cysts and odontogenic keratocysts, as well as odontogenic tumors like ameloblastoma, Pindborg tumor, odontogenic fibroma, and cementoma, can exhibit similar radiological features to radicular cysts. Therefore, histopathological evaluation is often essential for diagnosing these larger lesions. In extensive cases, radiographs may not adequately reveal the full extent of the lesions, necessitating the use of advanced imaging techniques [9, 10].

Histologically, radicular cysts are typically lined either partially or completely by nonkeratinized stratified squamous epithelium. Keratinization occurs in a small percentage of cases, around 2%, and when it does occur, the orthokeratinized layer is more profound than the parakeratinized walls with dense, mixed inflammatory infiltrate, rich in plasma cells and lymphocytes. Additionally, the walls are fibrous and often contain numerous capillaries, especially in areas close to the epithelial lining [11].

Kay and Kramer reported cases of radicular cysts transforming into squamous carcinoma. This transformation is typically linked to long-standing cases; however, in our case, there was no histopathological evidence of epithelial dysplasia [12, 13].

The recommended treatment for a radicular cyst involves a conventional endodontic approach, often combined with decompression, 13, or surgical enucleation of the cyst along with the extraction of the offending tooth. Some authors argue that suspected radicular cysts should be entirely surgically enucleated to eliminate all epithelial remnants [14], the treatment of these cysts remains a topic of debate, with many professionals preferring a conservative approach using endodontic techniques. However, for larger lesions, endodontic treatment alone may not be sufficient and should be combined with decompression, marsupialization, or even enucleation [15, 16].

Enucleation of large jaw cysts is an invasive procedure that can lead to complications, such as damage to adjacent teeth or anatomical structures. However, contemporary and less invasive surgical techniques for treating large radicular cysts have been developed [17].

CONCLUSION

Although rare, giant radicular cysts can lead to considerable complications because of their size. The preferred treatment is surgical enucleation along with the extraction of non-vital teeth. It is crucial to conduct regular follow-ups to identify any possible recurrences.

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