Case Report | International Journal of Dental Materials 2024:6(2) | ISSN:2582-2209

Radicular cyst of mandibular anterior region: a case report

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Article History

Received *8th March 2024*
Accepted *21st June 2024*
Available online *31st July 2024*

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DOI: http://dx.doi.org/10.37983/IJDM.2024.6205

Abstract

The radicular cyst is the most common odontogenic cyst affecting the jaws. It is a chronic inflammatory response in the epithelial cell rests of malassez, usually following pulpal necrosis. Chronic irritation like trauma, microbial infections or chemical injury can predispose radicular cysts. Radicular cysts, also known as Periapical cysts, found at the apices of the nonvital teeth are classified under the cysts of inflammatory origin as the inflammatory products initiate the growth of the epithelial component. This case report presents a radicular cyst involving the mandible in a 25-year-old male patient reported to the Department of Oral Medicine & Radiology with pain in the lower front tooth region. The etiopathogenesis, clinical, radiographic, and histologic findings, along with the differential diagnoses and treatment modalities, were discussed in this case report.

Keywords: Enucleation, Non-vital tooth, Root canal treatment.

1. Introduction

The radicular cyst, also known as periapical cyst, is the most common odontogenic cyst affecting the teeth-bearing areas of jaws [1]. Incidence is highest in the third and fourth decades of life, with a male predilection [2]. Although anatomically periapical cysts occur in all tooth-bearing sites of the jaw, the common site is maxilla [1, 3]. It originates from the epithelial cell rests of Malassez in the periodontal ligament due to inflammation caused by pulp necrosis or trauma [2]. The initial enlargement of the cyst feels hard because it is covered by bone. As the cyst increases in size, the bony covering becomes very thin, and the swelling then exhibits 'springiness' or 'eggshell crackling' as the covering bone becomes very thin due to the increasing size of the cyst and becomes fluctuant when the cyst has completely eroded the bone. Although there is no clear correlation between infection and symptoms, it is often said that radicular cysts are usually painless, unless infected [2]. Definitive diagnosis must be based on clinical, radiographic, and histological evaluation. Histopathologically, the radicular cyst exhibits a closed pathological cavity, partially or completely lined by non-keratinised stratified squamous epithelium along with chronic inflammatory cell infiltrations [2]. The treatment of the cysts can be either nonsurgical management with endodontic treatment or surgical management including either marsupialization or enucleation [4].

2. Case Report

A 25-year-old male patient reported to the Department of Oral Medicine and Radiology, Lenora Institute of Dental Sciences, Rajanagaram with a chief complaint of pain and swelling in the lower front tooth region for the past two months. The swelling began as a small peanut-sized lump and gradually increased in size. It was accompanied by sudden, mild, intermittent, non-radiating pain that worsened with food consumption and was temporarily relieved by medication. The patient gave a history of trauma to the lower anterior teeth at the age of 10 years. On general and physical examination, the patient was conscious, coherent, cooperative and well-oriented in the dental chair with a normal gait, erect posture, moderately built and moderately nourished, and all the vital signs were within the normal limits.

On the extra-oral examination, a diffuse swelling measuring approximately 2×2 cm in size was observed on the lower third of the face (Figure 1). The swelling extended from the symphyseal region to 3 cm away from the line connecting the tragus of the ear and the corner of the mouth on both the right and left sides. It also extended from the vermilion border of the lower lip to the chin. The skin covering the swelling appeared stretched, but the surrounding skin was normal without any surface ulcers or visible pulsations. On palpation, all the inspection findings regarding site, size, shape and extensions were confirmed. The swelling was soft in consistency, and non-tender, with no local rise of

temperature. Further, it was non-compressible, non-reducible, and non-pulsatile.

Figure 1. Extra-oral swelling involving lower third of face.

On intra-oral examination, a roughly round to oval swelling obliterated the vestibule of the mandibular anterior region in association with discoloured 31 and 41 (Figure 2). The swelling was soft, fluctuant, inflamed and non-tender. The swelling extends anteroposteriorly distal aspect of 31 to the distal aspect of 41, superioinferiorly near the lower vestibular sulcus and lies near the midline of the mandible. Based on the patient's history and the above-mentioned clinical findings, a provisional diagnosis of radicular cyst in teeth 31 and 41 was given. The teeth 31 and 41 did not respond to electric pulp testing, indicating that they are non-vital. Intra-oral periapical radiograph & Occlusal radiograph of the mandible revealed a well-defined radiolucency involving the periapical regions in relation to 31 & 41 (Figure 3a& 3b). The OPG showed a large, well-defined, well-corticated, unilocular radiolucency with a sclerotic border of approximately 1.5 X 2 cm in the periapical region of the 31& 41. There was no evidence of root resorption/ displacement. The inferior border of the mandible was intact (Figure 4).

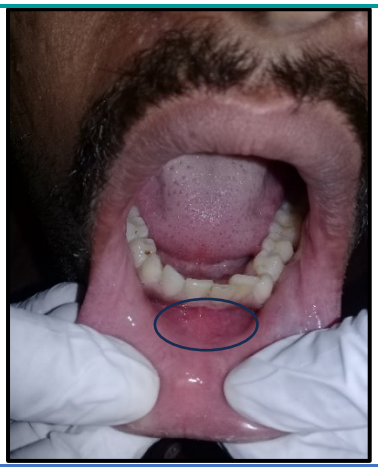

Figure 2. Intra-oral view depicting non vital, discoloured 31,41 along with mild swelling.

Based on the above findings, the provisional diagnosis was a Radicular cyst involving teeth 31 and 41. The differential diagnoses considered based on radiological findings included periapical cemento-osseous dysplasia, traumatic bone cyst, and ameloblastoma. Upon fine needle aspiration cytology (FNAC), 1.5ml of straw-coloured fluid was obtained, revealing abundant proteinaceous debris and inflammatory cells, predominantly neutrophils (Figure 5). Considering all the findings and investigations, the final diagnosis was a Radicular cyst involving teeth 31 and 41. Endodontic treatment was performed on teeth 31 and 41 under local anaesthesia, and the patient was followed up for one month with no complications or recurrence.

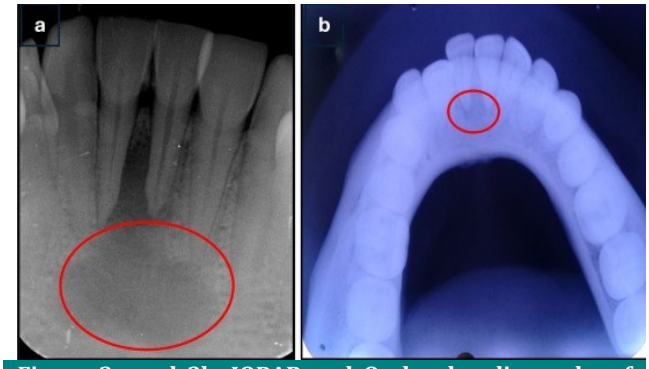

Figure 3a and 3b. IOPAR and Occlusal radiographs of mandible showing radiolucency measuring approximately 1.5×2 cm extending from distal aspect of 31 to distal aspect of 41.

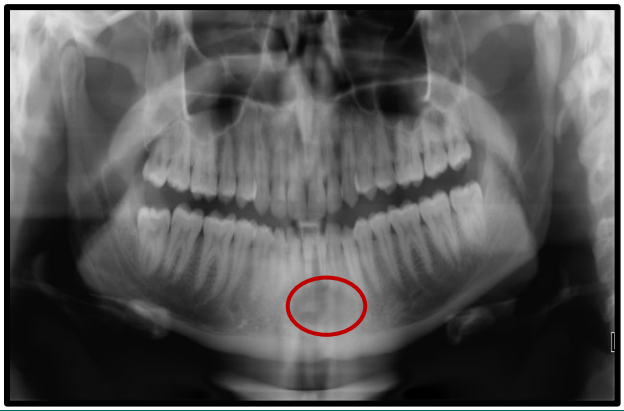

Figure 4. The OPG showing a large, well-defined, well corticated, unilocular radiolucency with a sclerotic border in the periapical region of the 32 to 44.

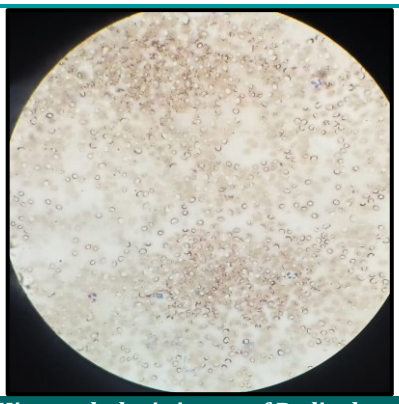

Figure 5. Histopathologic image of Radicular cyst.

3. Discussion

The radicular cyst comprises 52%–68% of all jaw cysts and 55% of odontogenic cysts [5]. The pathogenesis of radicular cysts can be described under three phases: initiation, cyst

formation and enlargement [2]. The necrotic debris and bacterial antigens derived from the dead pulp initiate the inflammatory proliferation of epithelial cell rests of Malassez in the periodontal ligament. According to nutritional deficiency theory summarised by Lin et al., in the second phase, the cystic cavity is formed by the degeneration and death of cells in the centre and lined by the proliferating odontogenic epithelium [4].

According to Toller [6], the third phase of growth and enlargement is affected by an osmotic imbalance with the surrounding tissues due to the absence of lymphatic drainage. It was also found that intracystic pressure was inversely proportional to cyst size, so increased pressure played a pivotal role in early cyst growth. Radicular cysts are commonly seen between the ages of 30 and 50, with a male predilection (M:F 1.6:1) [7]. However, the present case was observed in a 25-year-old male patient and affected the anterior region of the mandible. Radicular cysts are usually asymptomatic and, in many cases, they are diagnosed accidentally during routine radiographic examination. A radicular cyst is always associated with non-vital teeth and may develop signs and symptoms such as swelling, tooth mobility and displacement of unerupted teeth in long-standing cases due to acute exacerbation [8,9]. In the present case, there was mild swelling in relation to discoloured, non-vital 31, 41. Radiographically, the radicular cyst appears as a well-defined unilocular radiolucency located in the periapical region of a non-vital tooth or tooth with large restoration/ caries/ fracture [10,11].

The present case revealed a unilocular, radiolucent lesion with well corticated margin. Histopathologically, radicular cysts are lined by proliferative, non-keratinized squamous epithelium in an arcading pattern with intense inflammatory infiltration in the fibrovascular connective tissue. Keratin formation (2% of cases) when present, affects only part of the cyst wall [2]. Multiple treatment modalities for radicular cysts have been proposed [12]. 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 [13,14]. Nonsurgical endodontic (root canal) therapy is the treatment of choice for localized lesions whereas large lesions need a surgical approach like enucleation, marsupialization or decompression [15,16]. In the present case, non-surgical endodontic (root canal) treatment was done with a one-month follow-up and the patient was under regular follow-up.

4. Conclusion

The radicular cyst is the common odontogenic inflammatory cyst that arises from the cell rests of malassez. It is asymptomatic and swelling proceeds solely indicating cortical plate expansion. The radicular cyst is the consequence of pulpal necrosis and was diagnosed based on clinical & radiological findings and confirmed with histopathological examination. Treatment options were based on the extent of the lesion, structure, origin and clinical/ systemic condition of the patient. The untreated cyst may expand causing local tissue destruction and further pathological deformity. Management includes non-surgical endodontics and surgical methods like decompression, marsupialization, or enucleation.

Conflicts of interest: Authors declared no conflicts of interest.

Financial support: None

References

1. Nair PN. Review New perspectives on radicular cysts: Do they heal? Int Endod J. 1998; 31:155-60. https://doi.org/10.1046/j.1365-2591.1998.00146.x
2. Shear Mervyn, Speight Paul, Cyst of the oral and maxillofacial regions, 4th ed., Wiley-Blackwell. 2007;4:123-142.
3. Rees JS. Conservative management of a large maxillary cyst. Int Endod J. 1997; 30:64-7. https://doi.org/10.1111/j.1365-2591.1997.tb01100.x
4. Latoo S, Shah AA, Jan SM, Qadir S, Ahmed I, PurraAR *et al.*, Radicular cyst: Review article. JK Sci, 2009;11:187-9.
5. Akari Noda, Masanobu Abe, Aya Shinozaki-Ushiku, Yae Ohata, Liang Zong, Takahiro Abe et al., A Bilocular Radicular Cyst in the Mandible with Tooth Structure Components Inside, Case Reports in Dentistry, 2019, Article ID 6245808:4p. https://doi.org/10.1155/2019/6245808
6. Toller PA. Experimental investigations into factors concerning the growth of cysts of the jaws. Proceedings of the Royal Society of Medicine. 1948; 41:681-688. https://doi.org/10.1177/003591574804101016
7. Weber AL. Imaging of cysts and odontogenic tumors ofthe jaw. Radiol Clin North Am. 1993; 31:101-120. https://doi.org/10.1016/S0033-8389(22)02197-2
8. Mass E, Kaplan I, Hirshberg A. A clinical and histopathological study of radicular cysts associated with primary molars. J Oral Pathol Med. 1995; 24:458-61. https://doi.org/10.1111/j.1600-0714.1995.tb01134.x
9. Lustmann J, Shear M. Radicular cysts arising from deciduous teeth: Review of the literature and report of 23cases. International Journal of Oral Surgery. 1985;14(2):153-61. https://doi.org/10.1016/S0300-9785(85)80087-9
10. Bodner L. Cystic lesions of the jaws in children, Int J Pediatr Otorhinolaryngol. 2002; 62:25-9. https://doi.org/10.1016/S0165-5876(01)00583-3
11. Cawson RA, Odell EW, Porter S, Cawson`s Essentials of Oral Pathology and Oral Medicine, 7th ed. Edinburgh: Churchill Livingstone, 2002, 102-21.
12. Domingos RP, Gonçalves ES, Neto ES, Pacenko MR, Surgical approaches of extensive periapical cyst, Considerations about surgical technique, Salusvita Bauru. 2004; 23:317-28.
13. Sivapathasundharam B. A textbook of oral pathology. Elsevier Health Sciences; India, 8th Edition, 2020.
14. Karemore TS: Textbook of Oral Medicine and Radiology. Karemore TS (ed): CBS Publishers, New Delhi; 2021.
15. Simre S, Patil C, Jadhav A, Kambala R : Bilateral radicular cyst of mandible mimicking odontogenic keratocyst treated using alloplastic calcium phosphate bone cement: an unusual case report. J Datta Meghe Inst Med Sci. 2020, 15:123-6. https://doi.org/10.4103/jdmimsu.jdmimsu_45_20
16. Gupta B, Gupta S, Chaudhary M, Raj AT, Patil S: Cross-sectional observational study evaluating the association between odontogenic cystic content and size. Arch Oral Biol. 2020, 120:104954. https://doi.org/10.1016/j.archoralbio.2020.104954

How to cite this article: Katru S, Koduri S, Budur K, Nalli P K, Mallolu V S, Masa A. Radicular cyst of mandibular anterior region: a case report. Int J Dent Mater. 2024;6(2):50-52. DOI: *http://dx.doi.org/10.37983/IJDM.2024.6205*