

The Diagnostic Dilemma of a Large Infected Cyst in Anterior Maxilla- A Case Report

Roopika Handa¹, Arpan Manna², Tanha Khan², Monika Singh², Aiman Mahfooz², Dhruv Garg²

¹Professor, ²PG Student, Department of Oral Medicine and Radiology, Teerthanker Mahaveer Dental College and Research Centre, Moradabad

Abstract

Among all the odontogenic origin cyst, radicular cyst is the commonest. It is generally associated with nonvital tooth which have necrotizing pulp as it is an inflammatory cyst. Radicular cyst usually occurs in the periapical region of tooth. As a true cyst it consists of pathologic cavity which is lined by epithelium and commonly filled with fluid. Treatment option for the radicular cyst depends on the size, location and duration of the lesion which includes endodontic treatment, enucleation of the lesion, extraction of the offending tooth and marsupialization. In this case report, we are describing a case of infected radicular cyst in anterior maxillary region.

Keywords: Radicular cyst, Odontogenic Cyst, Cell rest of Malassez, Fine needle aspiration cytology (FNAC), Enucleation, Marsupialization, Occlusal radiograph

Introduction

Radicular cyst is also referred as periapical cyst, dental cyst, apical periodontal cyst or root end cyst. As a sequel of pulpal necrosis or trauma, the epithelial cell rests of malassez in the periodontal ligament proliferates and give rise to the radicular cyst.¹ Most often the radicular cyst involves the apices of the infected tooth but it can also occur along the accessory or lateral root canal of the infected tooth.² It accounts for 52% to 68% of all other cyst found in the jaw.³ There is male predilection in third to fifth decades of life. Maxillary anterior region is the commonest involved site.² Shear et al describe it as usually asymptomatic and there may be no visible extraoral swellings.⁴

Radicular cysts are generally ranging from 0.5 to 1.5 cm in size,² although, larger radicular cyst have

been reported in literature.⁵ Treatment of the radicular cyst depends on the size and extension of the lesion. Although, endodontic therapy alone can heal the smaller lesions. For the larger or multiple lesion, enucleation, marsupialization or decompression along with endodontic intervention is the treatment of choice.⁶

Case Report

A 22 years old male patient reported to the department of oral medicine and radiology with the chief complaint of pus discharge from upper front tooth region for 15 days. Patient gave similar history of pus discharge 2 years back and subsequently undergone root canal treatment in upper front tooth region.

There was no related swelling and tenderness on extraoral examination.

On intraoral examination 11 was discoloured with pus discharge from the anterior labial sulcus. The previous dental treatment had resulted in reduced crown length and an edge to edge bite of 11 with 41. The margins of the gingiva were rolled out and inflamed (Fig 1). On palpation, there was no associated tenderness

Corresponding author:

Dr. Arpan Manna

Department of Oral Medicine and Radiology
Teerthanker Mahaveer Dental College and Research
Centre, Moradabad
arpanmanna97@gmail.com

and fluctuancy with respect to related palatal and labial vestibular region. Based on the chronicity and recurrence of the lesion provisional diagnosis of radicular cyst in the affected region was given.

Radicular cyst, nasopalatine duct cyst, odontogenic keratocyst, pindborg tumor and central giant cell granuloma were evaluated as differential diagnosis.

The radiographic investigation with anterior cross-sectional occlusal radiograph revealed a mixed radiopaque-radiolucent lesion extending from the apices of 11 and 21 to the palatal aspect of 16 region crossing the midline measuring approximately 3x4 cm in size.

The lesion had an ill- defined corticated margin and lateral root displacement of 11, 12, 21, 22 was seen (Fig 2).

Patient was then subjected to fine needle aspiration cytology (FNAC) as a part of chair-side investigation, which did not yield any aspiration. The vitality test of 12, 11, 21, 22 showed no response with respect to 12, 11, 21 and 21.

After correlating all the clinical and radiological findings, it was concluded to be an infected radicular cyst as final diagnosis.



Fig 1

Fig1: Discoloured 11 with pus discharge from the anterior labial sulcus.

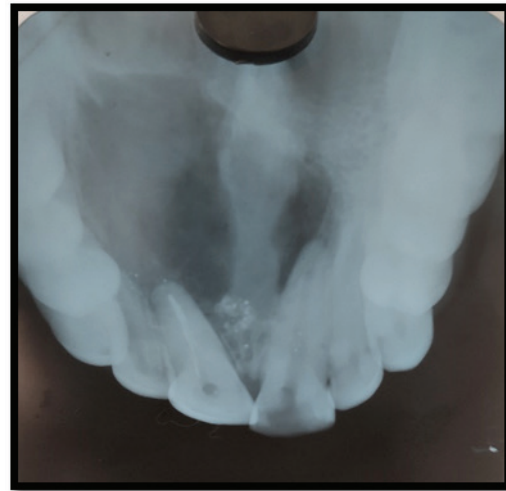


Fig 2

Fig2: Occlusal radiograph revealing a mixed radiopaque-radiolucent lesion extending from the apices of 11 and 21 to the palatal aspect of 16 region crossing the midline measuring approximately 3x4 cm in size.

Discussion

The radicular cysts are generally asymptomatic and not commonly noticed until they are secondarily infected and become symptomatic or as an accidental finding on routine radiographic investigation. Sometimes long standing lesions become symptomatic due to acute exacerbation.⁷ Cortical expansion is a common clinical feature of radicular cyst in maxilla, as compared to mandible.¹ Consistency of the cystic swelling changes depending on the thinning of the bony covering from

hard to springy to fluctuant.⁸ Resorption of the affected root, cortical expansion, adjacent teeth displacement are the common radiological features of radicular cyst. In our case no such features were appreciable. According to the available literature, the lesion adjacent to the teeth to the lesion frequently become nonvital as the lesion enlarges,¹ and our present case also gave similar features. The epicentre of the lesion in non-vital tooth, usually located at the root apex where as in case of accessory canals it is usually located on the mesial or distal aspect of

the root.⁹ However in our case the epicentre was located on the medial aspect of the offending tooth root and the associated teeth were non-vital. Usually radicular cyst have a well-defined cortical border until and unless it is secondarily infected in which case the cortical border becomes sclerotic.¹⁰ The outline of the cyst is curved or circular unless it is influenced by surrounding structures and sometimes dystrophic calcifications may develop in long standing conditions which appears as radiopacity sparsely distributed in the lesion.⁹

The pathogenesis of radicular cysts includes three phases- i) phase of initiation ii) phase of cyst formation iii) phase of enlargement.^{9 10} Pathogenesis of the radicular cyst was described by Torabinejad (1983) according to the “breakdown/nutritional deficiency theory” and “abscess cavity theory.” The “breakdown” theory suggests that of pulpal necrosis the noxious stimuli continue to provoke the epithelial cells which are derived from epithelial cell rests of Malassez. These epithelial cells continue to proliferate and the lesion become larger and the central cells become deprived of nutrition from the connective tissue and as a result central cells undergo liquefactive necrosis, leading to the development of microscopic cyst. According to the “abscess cavity theory”, the epithelial cell tends to line the exposed connective tissue and these cells proliferate and lined the cavity.^{12 13}

Cystic fluid plays an important role for diagnosis in case of the odontogenic cysts as it can vary from lesion to lesion such as clear fluid, yellow coloured fluid which mainly contains protein. Generally, in radicular cyst, cystic fluid contains 5-11g protein per 100 ml of fluid which is quite higher as compared to other cysts of odontogenic origin such as odontogenic keratocyst, dentigerous cyst. Concentration of globulin (both α 1 and β) in radicular cyst is higher than other odontogenic cysts.¹⁴

In most studies it is seen that the healing process of this lesion is dependent on the lesion size.^{15 16} In most of the studies it is stated that treatment protocol depends on the size and extent of the lesion. If the lesion

is small conservative treatment is sufficient^{2 16} and however in larger lesions which include decompression, marsupialization or enucleation of the cysts^{17 18} as the treatment choice.

Conclusion

Radicular cyst is one of the most common odontogenic cyst which can be encountered during dental practice though usually it is asymptomatic. Malignant transformation of radicular cyst is very rare. Non-surgical, conservative approach is the treatment of choice for smaller lesions nowadays. However surgical intervention might be necessary sometimes.

Conflict of Interest: There is no conflict of interest.

Donation: Nil

Ethical Clearance: Taken from ethical committee of the college.

References

1. Nagaraj T, Sinha P, Saxena S, Sahu P, Biswas A. Radicular cyst in upper left incisor - A case report. *J Med Radiol Pathol Surg* 2018;5:5-7.
2. Tootla, S, Premviyasa, V, Yengopal, V, Howes, D, & Morar, Nikita. (2017). Radicular cyst: Atypical presentation and therapeutic dilemma. *South African Dental Journal* , 72(8), 379-382.
3. Nair PN. New perspectives on radicular cysts: do they heal? *Int Endod J*. 1998 May;31(3):155-60. doi: 10.1046/j.1365-2591.1998.00146.x. PMID: 10321160.
4. Shear, M. and Speight, P. (2007). Radicular Cyst and Residual Cyst. In *Cysts of the Oral and Maxillofacial Regions* (eds M. Shear and P. Speight).
5. Kadam,N.S.,Ataide,I.D.,Raghava,P.Fernandes,M. Hede,R.(2014).*Management of Large Radicular Cyst by Conservative Surgical Approach: A Case Report*, 8(2), 239-241.
6. Balaji Tandri S. Management of infected radicular cyst by surgical decompression. *J Conserv Dent*. 2010 Jul;13(3):159-61. doi: 10.4103/0972-0707.71651. PMID: 21116394; PMCID: PMC2980615.
7. Shear M. *Cysts of the Oral Regions*. 3rd ed. Boston:

- Wright; 1992 p. 136-70.
8. Mass E, Kaplan I, Hirshberg A: A clinical and histopathological study of radicular cysts associated with primary root caries. *J Oral Pathol Med* 1995; 24: 458-61.
 9. RADICULAR CYST: A LITERATURE REVIEW Bashir Taseer, Ahmad Naeem, Saluja Arti, Chandel Shilpi, Yadav Monu, Krishnan Vijay Volume 2 Issue 9 Pages-1887-1891 September-2014 ISSN (e): 2321-7545
 10. Jansson L, Ehnevid H, Lindskog S, Blomlöf L. Development of periapical lesions. *Swed Dent J*. 1993;17(3):85-93. PMID: 8356537.
 11. High AS, Hirshmann PN. Age changes in residual radicular cysts. *J Oral Pathol* 1986; 15: 524-528.
 12. Koju S, Chaurasia NK, Marla V, Niroula D, Poudel P. Radicular cyst of the anterior maxilla: An insight into the most common inflammatory cyst of the jaws. *J Dent Res Rev* 2019;6:26-9.
 13. P.N. Ramachandran Nair, Gion Pajarola, Hubert E. Schroeder, Types and incidence of human periapical lesions obtained with extracted teeth, *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, Volume 81, Issue 1, 1996, Pages 93-102, ISSN 1079-2104.
 14. Prakash R, Shyamala K, Girish HC, Murgod S, Singh S, Rani PSV. Comparison of components of odontogenic cyst fluids: A review. *J Med Radiol Pathol Surg* 2016;2:15-17.
 15. Sjogren U, Hagglund B, Sundqvist G, Wing K. Factors affecting the long-term results of endodontic treatment. *J Endod* 1990; 14:498e504.
 16. Matsumoto T, Nagai T, Ida K, et al. Factors affecting successful prognosis of root canal treatment. *J Endod* 1987;13:239e42.
 17. Neaverth EJ, Burg HA. Decompression of large periapical cystic lesions. *J Endod*. 1982;8:175-82. [PubMed]
 18. Tandri SB. Management of infected radicular cyst by surgical decompression. *J Conserv Dent*. 2010 Jul-Sep; 13(3): 159-161. doi: 10.4103/0972-0707.71651 PMID: PMC2980615.