

Management of Radicular Cyst- A Case Report

Jaspreet Singh^{1*}, Saurabh Bhagat², Abhinav Aneja³, Ridhi Sharma⁴, Manjot Kaur³

¹Prosthodontics and Crown and Bridge, Baba Jaswant Singh Dental College and Hospital, India

²Conservative Dentistry and Endodontics, Private practitioner, Rootcare dental clinic, Jalandhar, India

³Private Practitioner, India

⁴Prosthodontics and Crown and Bridge, Baba Jaswant Singh Dental College and Hospital, India

Citation: Jaspreet Singh, Saurabh Bhagat, Abhinav Aneja, Ridhi Sharma, Manjot Kaur. *Management of Radicular Cyst- A Case Report. Ann Case Rep Clin Stud.* 2023;2(3):1-5.

Received Date: 01 July, 2023; **Accepted Date:** 04 July, 2023; **Published Date:** 06 July, 2023

***Corresponding author:** Jaspreet Singh, Prosthodontics and Crown and Bridge, Baba Jaswant Singh Dental College and Hospital, India

Copyright: © Jaspreet Singh, Open Access 2023. This article, published in Ann Case Rep Clin Stud (ACRCS) (Attribution 4.0 International), as described by <http://creativecommons.org/licenses/by/4.0/>.

INTRODUCTION

A cyst is a pathological cavity that may or may not be lined by epithelium, and is always filled with fluid or semifluid material but not pus.^[2,3] Cysts are classified as developmental or odontogenic cysts based on their aetiology. Radicular cysts are odontogenic in origin as per classification by WHO.² Radicular cysts (apical periodontal cyst, dental root end cyst) are the most common inflammatory odontogenic cysts of tooth bearing areas of the jaws. They originate from an epithelial rest of Malassez which are present in periodontal ligaments and these cells are provoked by inflammation. Radicular cyst is most frequently found at the apex of the involved tooth with infected or necrotic pulps; however, they may also be found on the lateral aspects of the roots in relation to accessory root canals. Usually apical periodontal cyst occur between 3rd and 6th decade of life with male predominance. Clinically, the lesion is usually small and asymptomatic but at times may exhibit mild pain and sensitivity to percussion.¹ Small sized radicular cysts are mostly treated conservatively while large sized are usually treated surgically by enucleation. Sometimes extraction of involved tooth with hopeless prognosis is also advocated with cyst removal. The cystic wall must be totally enucleated to remove all epithelial remnants to prevent recurrence of the lesion.

The present case report documents a case of radicular cyst in the anterior maxilla.

Keywords- Radicular Cyst; MTA; Histopathology; RCT; Odontogenic Cyst

CASE REPORT

A 30 year old female reported with chief complaint of pain in upper right anterior region of jaw since 20 days. On evaluating history of present illness about pain it was found that pain was dull, continuous, non-radiating, aggravates on mastication and relieves on medication. Also patient reported of tooth being discolored from long time. Her past medical history was non-contributory. On extraoral examination, there was a mild-to-moderate swelling on the right side of maxilla with the skin appearing to be normal. On palpation, the swelling appeared hard, afebrile and mildly tender. Lymph nodes were non-palpable. Intra-oral examination revealed that patient

had swelling in right maxillary labial region, swelling was 2X2 cm in size, carious 12 (maxillary right lateral incisor), it was also tender on percussion, a draining sinus was also present in labial vestibular region which when traced lead near 12 (maxillary right lateral incisor). On radiographic evaluation it was seen that a well-defined radiolucency was found associated with apex of 21 (maxillary right lateral incisor), a corticated border was also evident on radiograph.

Provisional diagnosis was dental caries in 12 (maxillary right lateral incisor) with draining sinus and radicular cyst associated with it.

TREATMENT

As per provisional diagnosis we tried to resolve the lesion by doing root canal treatment and afterwards by giving calcium hydroxide dressing for 15 days followed by triple antibiotic paste for another 15 days but no resolution was noticed, then surgical intervention was thought to be the best treatment option to treat this condition. Caries removal was done as a first step and that was followed by RCT (Root Canal Treatment) of 12(maxillary right lateral incisor) after this buccal flap was raised and buccal cortical bone was cut in 12(maxillary right lateral incisor), followed by complete removal of the granulation tissue and curettage. A specimen was taken and sent for histopathological evaluation. Root end of 12(maxillary right lateral incisor) was resected and MTA plug was placed which is evident in radiograph. Finally bone graft was placed and flap was re-placed back with sutures.



Figure 1: Lesion after flap raise

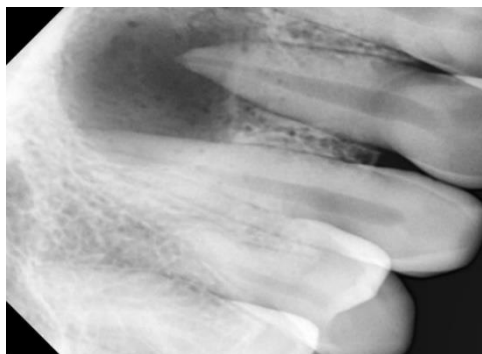


Figure 2: periapical radiolucency

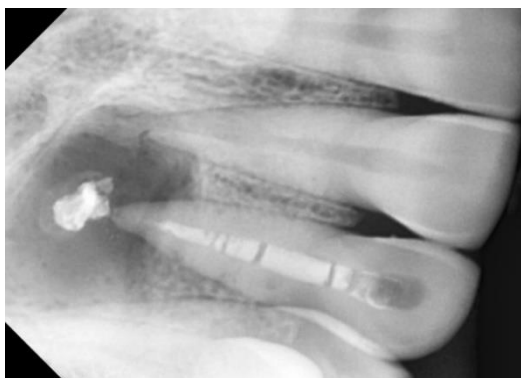


Figure 3: calcium hydroxide placement

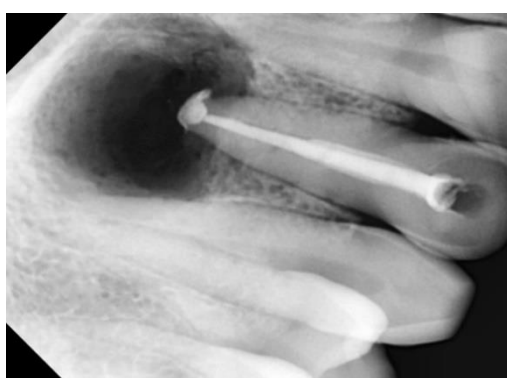


Figure 4: MTA placed at apex of tooth after apical resection of 12

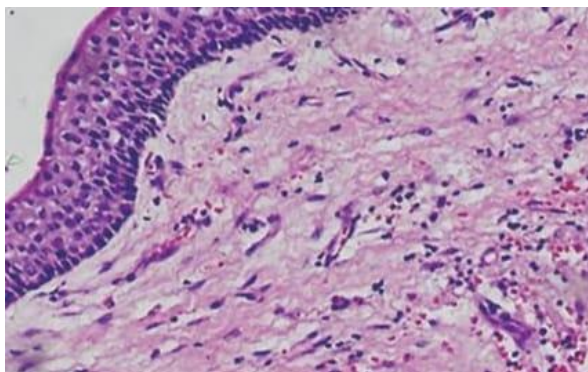


Figure 5: Bone graft placement

Biopsy report

Section shows stratified squamous epithelium proliferating deep in stroma forming arcades in many areas, the underlying stroma is highly inflamed. Many blood vessels and extravasated RBCs are seen.

Remarks- **RADICULAR CYST**



FOLLOW UP

Postsurgical follow-up after 15 days was done which showed considerable reduction in the size of swelling with prompt healing of the surgical site. And patient's pain was relieved

At 3-month follow-up, no recurrence was observed. (figure 6)

The patient was recalled every month for follow up from then and till time there is no evidence of pain or recurrence and excellent healing is evident. (figure 7)



Figure 6: Healing after 3 months



Figure 7: healing after 8 months

DISCUSSION

Radicular cyst considered an inflammatory cyst because its occurrence is followed by carious tooth or trauma. The pathogenesis of radicular cyst can be explained as a tooth with trauma or dental caries, which ends up in pulpal necrosis from where the infection travels to the tooth apex of the root and form periapical granuloma which later may or may not get converted to periapical cyst due to the provocation of epithelial rest of Malassez by the local inflammation. Radicular cyst is considered to be the most common cysts, 52–68% of all the cysts affecting the jaws, around 9% are true cysts i.e. no connection with root canal and 6% pocket cysts. The incidence of radicular cyst in deciduous tooth seems to be low as compared to a permanent tooth. The lesser duration of primary teeth could be one of the reasons for the same and the easy drainage via numerous accessory canals.^[2,3,4] The growth of radicular cyst is described in three phases; phase of initiation, cyst formation, and cyst enlargement. The theories of cyst cavity formation are - The “nutritional deficiency theory” is based on deficiency of nutrients to centre of granuloma which then gets converted to cyst and the “epithelial cell proliferation theory” that the proliferating epithelial cells lines an abscess cavity formed by tissue necrosis and lysis this occurs because of the innate nature of the epithelial cells to cover exposed connective tissue surfaces then the cyst grows further by osmosis. The increased proliferating cells number and osmotic pressure of cyst leads to bone resorption and expansion of the cyst. In case of Pocket cysts with lumen open to the necrotic root canal can become larger than usual because osmotic pressure plays a potential factor in the development of radicular cysts. Histopathological picture showing stratified squamous epithelium of variable thickness and connective tissue with plenty of chronic inflammatory cell infiltrate Radicular clinically has no symptom until there is an acute inflammatory exacerbation, the cyst reaches a large size, followed by swelling. Movement and mobility of adjacent teeth may occur as the cyst enlarges in size. Radiographic features show a well-defined unilocular radiolucency located periapical to a tooth with pulp involvement. The margin of a radicular cyst is radiopaque with hyperostotic borders, which is continuous with the lamina dura. However, in infected or rapidly enlarging cysts, the radiopaque margin may not be present or evident clearly. The chronic radicular cyst may result in the resorption of offending tooth roots. Despite being infected the present case had a clear radiopaque border and no root resorption was evident, which was helpful in making the provisional diagnosis as radicular cysts. Other odontogenic cysts like dentigerous cysts, odontogenic keratocysts and odontogenic tumours such as ameloblastoma, Pindborg tumour, odontogenic fibroma and cementoma may share the same radiological features as radicular cysts so histopathology is considered as a final answer.^[2] Histopathologically, radicular cysts are lined completely or in part by stratified squamous epithelium. These linings may be continuous or discontinuous range in thickness from 1 to 50 cell layers thick. The lumen of a cyst contains fluid with low concentration of protein and collection of cholesterol clefts (Rushton bodies) with multinucleated giant cells. The deposits of cholesterol crystals arise from the disintegrated red blood cells, lymphocytes, plasma cells and macrophages. Occasionally metaplastic changes, in the form of mucous cells or ciliated cells, are frequently found in the epithelial linings of radicular cysts due to migration of these cells from maxillary sinus or nasal cavity.

In few cases squamous carcinoma occasionally arises from the metaplastic changes in the epithelial lining of the radicular cysts.^[5,8,9] Long-standing cases of radicular cysts have shown histopathological evidence of transition from a cystic lining to epithelial dysplasia and further progressing as infiltrating squamous carcinomas.^[2,3] Periapical lesions and cyst-like lesions can be initially managed by nonsurgical endodontic treatment.⁶ In some cases, surgical management might be necessary for a better prognosis. Enucleation of large

cysts in the jaws is an invasive procedure which may lead to complications such as damage of the adjacent teeth or anatomic structures, but advanced and less invasive surgical techniques for treating large radicular cysts have been developed^[7] Endoscopically assisted enucleation is an innovative alternative method that can be as conservative as marsupialisation^[10] allowing preservation of important surrounding structures, reduced healing period and very low morbidity. Good knowledge oral, pulpal and periapical microflora will help in better treatment outcome. Also more biocompatible materials like MTA for root end filling followed by endodontic surgery provide excellent post-operative results.^[12]

Also to achieve better healing of periapical area bone graft was used. However, there various controversies regarding the use of guided bone regeneration techniques in periapical bone defects. Few studies states that regenerative techniques are not superior, either with regard to the speed or quality of healing. In contrast, various other studies state that conventional treatment results were less predictable in comparison with cases in which regeneration methods were used.¹¹ But in our case better healing was evident.

CONCLUSION

Radicular cyst is one of the most prevalent cysts occurring in the jaw. So, treating doctor must be well versed with the treatment options and protocol that are required to treat this condition in its various stages.

REFERENCES

1. Shivhare P, Singh A, Haidry N, Yadav M, Shankarnarayan L. Multilocular radicular cyst - a common pathology with uncommon radiological appearance. J Clin Diagn Res 2016;10(3):ZD13–ZD15.
2. Rajendran R. Shafer's textbook of oral pathology. Elsevier India; 2009.
3. Neville BW, Damm DD, Allen CM, Chi AC. Oral and maxillofacial pathology. Elsevier Health Sciences; 2015.
4. Lin LM, Ricucci D, Kahler B. Radicular cysts review. JSM Dent Surg 2017;2(2):1017.
5. Noda A, Abe M, Shinozaki-Ushiku A, Ohata Y, Zong L, Abe T, et al. A bilocular radicular cyst in the mandible with tooth structure components inside. Case Rep Dent 2019;2019:6245808.
6. Bava FA, Umar D, Bahseer B, Baroudi K. Bilateral radicular cyst in mandible: an unusual case report. J Int Oral Health 2015;7(2):61–63.
7. Harshitha KR, Varsha VK, Deepa C. Radicular cyst-A case report. Int J Appl Dent Sci 2015;1(4):20–22.
8. Kay LW, Kramer IR. Squamous cell carcinoma arising in a dental cyst. Oral Surg Oral Med Oral Pathol 1962;15:970–9
9. Swinson BD, Jerjes W, Thomas GJ. Squamous cell carcinoma arising in a residual odontogenic cyst: case report. J Oral Maxillofac Surg 2005;63:1231–3
10. Johann AC, Gomes Cde O, Masquita RA. Radicular cyst: a case report treated with conservative therapy. J Clin Pediatr Dent 2006;31:66–7
11. Deshmukh J, Shrivastava, Bharath KP, Mallikarjuna, Giant radicular cyst of the maxilla, NIH, National Library Of Medicine, National Centre For Biotechnology Information,
12. Kanipakam Y, Arumugam SD, Kulandairaj PL, Muthanandam S, Radicular Cyst (Periapical Cyst): A Case Report, jp journal-10083-0908.