Case report

Radicular cyst as an epilogue of trauma from occlusion at an unfamiliar site: A rare case report

Anu Chandran[1], Anegundi Raghavendra Vamsi[2], Biju Thomas[1], S. V. Sreelatha[3]

[1]Department of Periodontics, NITTE (DEEMED TO BE UNIVERSITY), AB Shetty Memorial Institute of Dental Sciences, Derlakatte, Mangaluru, 575 018, Karnataka, India

[2]Department of Periodontics, Saveetha, Dental College, SIMATS, Saveetha University, Chennai, Tamil Nadu, India.

[3]Department of Oral and Maxillofacial Pathology and Oral Microbiology, NITTE (DEEMED TO BE UNIVERSITY), AB Shetty Memorial Institute of Dental Sciences, Derlakatte, Mangaluru, 575 018, Karnataka, India

(Received: April 2022 Revised: December 2022 Accepted: January 2023)

Corresponding author: **Biju Thomas.** Email: bijuthomas172230@gmail.com

ABSTRACT

The radicular cyst is a common visitant in a dental office especially dealing with the non-vital tooth. It is a sequela of apical periodontitis, and it is often associated with carious teeth. Trauma from occlusion, in the long run, will lead to apical periodontitis. The association of radicular cyst with trauma from occlusion is rare, and this case report is one such incidence. A 38- year -old male patient reported with the chief complaint of mobility and swelling in the lower front teeth region for one month. Radiographs revealed a radiolucency around the apices of the mandibular central and lateral incisors. Trauma from occlusion was diagnosed using the fremitus test. Root canal therapy, surgical excision of the lesion, splinting, and coronoplasty was done concerning the affected teeth. The excised lesion on histopathological analysis revealed a cystic connective tissue capsule with a band of chronic inflammatory cells and abundant cholesterol clefts. This 18 month follow up case report emphasizes the rare occurrence of radicular cyst in the anterior mandible with a not-so-familiar etiology and possible ways to avoid its recurrence.

Keywords: Trauma; root canal therapy; excision; radicular cyst; coronoplasty.

INTRODUCTION

Radicular cysts are the most commonly observed cystic lesions of the jaws, predominantly in the maxilla than the mandible, and are often associated with non-vital teeth. They are frequently seen at the teeth' apices, sometimes at the lateral aspects of the roots(1), and are expected in all age groups, predominantly in the third and fifth decades of life. These are generally painless unless infected and often diagnosed during routine radiography(2). A radicular cyst is formed by the inflammatory proliferation of epithelial cell rests of Malassez (in PDL) in the apical area of the tooth, having an infected necrotic pulp associated with apical periodontitis (3). Radicular cysts cannot be diagnosed clinically or with radiographs and can be definitively diagnosed only by histological examination of biopsy specimens.

Pulp or periapical pathology's pathogenesis is inflammatory because of various factors such as bacterial, mechanical, and/or other such insults. Trauma from occlusion is a very well-known mechanical factor for the development of apical periodontitis, and more often than not, the teeth are non-vital(4). The continuous traumatic forces will never let the natural healing process to occur unless intervened at the earliest. When the insults are not eliminated, the aseptic pulp necrosis begins by destroying the microvascular cells, lymphatic and nerve fiber systems (5). Subsequently, the necrotic pulp products pass the periapical region. The inflammatory and dynamic immune process produces apical periodontitis, resulting in the release of cytokines such as Interleukin 17 that causes the activation of osteoclasts which produce bone resorption, enlargement, and progression of periapical lesions (6).

Case report

A 38- year -old male patient reported with the chief complaint of mobility and swelling in the lower front teeth region for one month. The patient was normal until he noticed swelling and mobility in the front tooth region for one month. The swelling was initially small in size and gradually progressed to the present size. Lymph nodes were non-palpable.

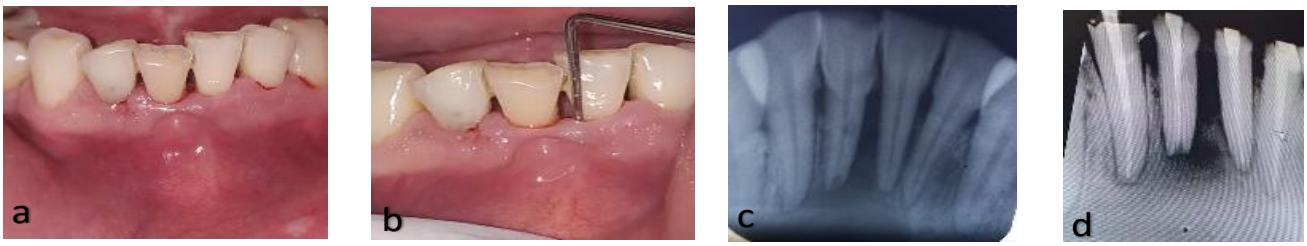

Figure 1: a and b: Clinical presentation (pre-operative). **c:** Initial Radiographic presentation. **d:** post-root canal therapy.

On clinical examination, an ill-defined swelling was observed in the labial vestibule extending from mesial of 33 to mesial of 43. The swelling was non-tender, soft, and fluctuant on palpation with a smooth texture. Sinus opening associated with pus discharge was seen at the summit of the swelling near the 41,31 regions. Attrition of lower anterior with positive fremitus test was observed, indicating active mechanical insults. (Fig. 1) A pulp vitality test revealed a negative result indicating necrotic pulp. Grade II mobility of 41,31 was noticed with a probing pocket depth of 4 mm. Differential diagnosis of the Radicular cyst, periapical granuloma, and the traumatic bone cyst was assigned. Root canal therapy and splinting of the lower anterior, followed by surgical excision of lesion and apicoectomy, were planned as a treatment protocol.

Surgical enucleation

Cyst enucleation procedure

Before starting the procedure, written informed consent was obtained. Under all aseptic conditions, lignocaine with 2% adrenaline was injected to anesthetize the operating site. Crevicular incision and two releasing vertical incisions were placed on the labial aspect extending from the left mandibular lateral incisor to the right maxillary lateral incisor to reflect full-thickness mucoperiosteal flap exposed a wide labial bone defect. Cyst lining was excavated with an angled curette and its content, followed by thorough curettage and irrigation done by normal saline. After elimination of cystic lining, apicoectomy was done concerning the affected tooth (41,31). Flap closure using 3-0 silk suture was done, followed by coronoplasty on all the affected teeth. The specimen was stored in formalin and sent for histopathological examination. After a week, the patient was recalled for the removal of sutures (Fig. 2).

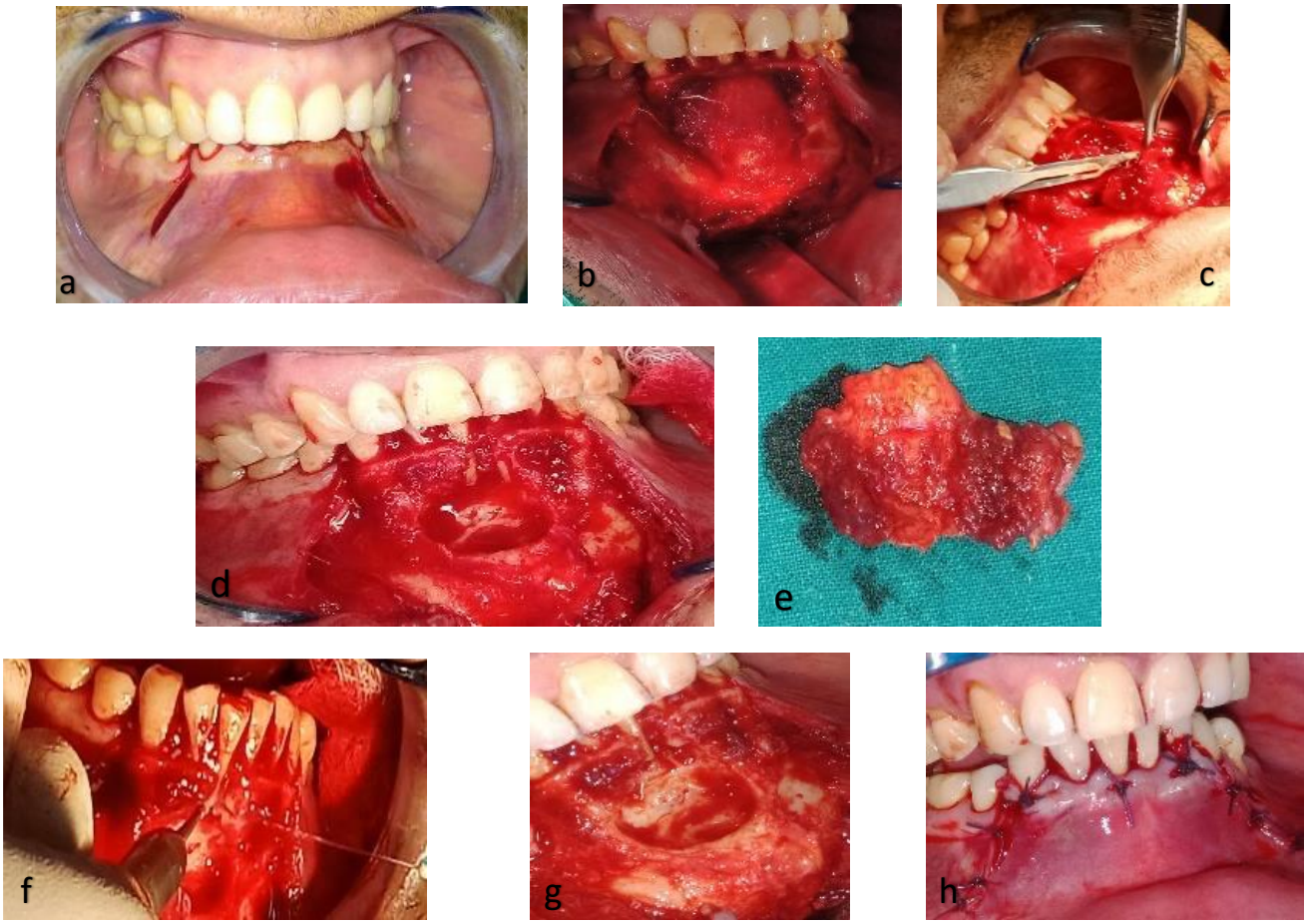

Figure 2: Surgical procedure: **a)** Incision placed, **b-d):** Enucleation of the cyst, **e)** excised tissue, **f and g)** apicectomy, **h)** primary closure achieved.

Histopathological Features:

Macroscopy

Gross examination of the single bit of soft tissue measuring 2.5 cm x 1.5 cm x 1.5 cm revealed a cystic lumen. The soft tissue was black and was firm in consistency.

Histopathology

The histopathological examination of the excised tissue revealed a cystic connective tissue capsule. The tissue was subjected to serial sections but there was no evidence of epithelial lining. A band of chronic inflammatory cells consisting chiefly of lymphocytes was evident admixed with foamy macrophages. Cholesterol clefts were seen in abundance throughout the section. The connective tissue wall was fibrous with densely packed collagen fibers. Numerous blood vessels and extravasated RBCs were seen. Bone spicules were evident at the periphery of the connective tissue capsule. Correlating with the clinical, radiographics, macroscopical, and microscopical features, an impression of the radicular cyst was given(Fig. 3).

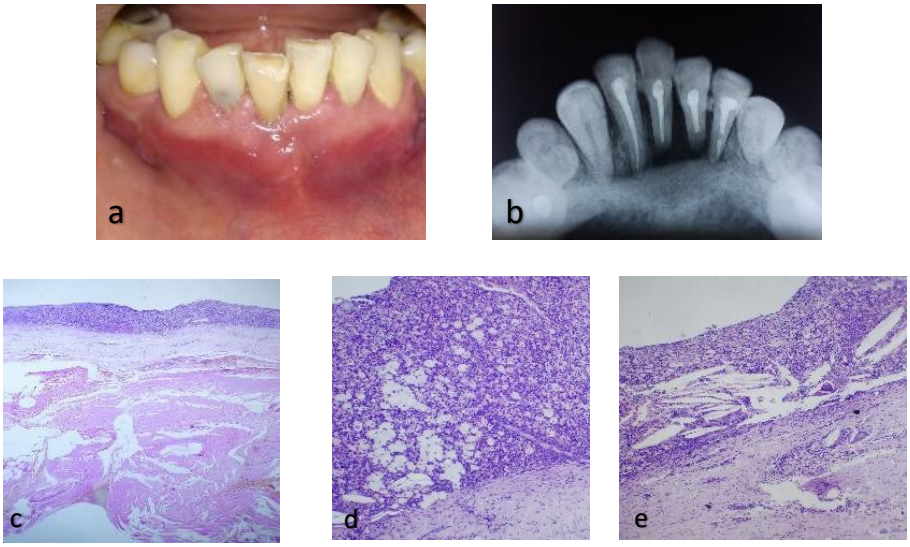

Figure 3: a and b) post-operative healing, **c-e)** Histopathological picture

Follow up

Post the visit for suture removal, the patient was lost due to follow-up due to the pandemic. However, the patient-reported back 18 months with clinically healthy tissues without any discomfort or pain. The patient was kept on maintenance therapy (Fig. 4).

Figure 4: Healthy tissues at 18 months follow up

DISCUSSION

The most commonly encountered cyst, i.e., radicular cyst (also called periapical cysts, dental cyst), is generally associated with a non-vital tooth and results as a sequela of apical periodontitis. Apical periodontitis results from multifactorial etiology and may be encountered with a combination of one or two causes. Generally, radicular cysts are associated with a carious tooth and are rarely seen in the anterior mandible. This case report is such a rarity where the teeth involved are caries-free and observed in the anterior mandible. The one possible etiology for the development of apical periodontitis is trauma from occlusion (Deep Bite in this case; 7) This disease process could lead to the initiation and progression of the radicular cyst from apical periodontitis. After routine cystic enucleation, the removal of etiology is also an essential factor to prevent its recurrence. Hence, in this case, coronoplasty was done to eliminate trauma from occlusion and is confirmed by a fremitus test.

As with most incidences, the lesion was asymptomatic and was not infected, which was reconfirmed by the histopathological analysis. In most cases, the preferred treatment option is extraction and cystic enucleation or draining it through the root canal (conservative approach; 8) In this case, an additional factor, i.e., trauma from occlusion, was also present. Hence, root canal therapy to the non-vital teeth, followed by surgical excision, apicectomy, and coronoplasty, was

performed. The natural tooth is preserved, along with improved prognosis of the adjacent teeth was also achieved.

Apart from its incidence as an apical cyst, it also manifests in the teeth' lateral aspects. This occurrence is due to the lateral canals' irritation or insults, leading to such peculiar lesions (9).

CONCLUSION

This case report emphasizes identifying and eliminating all possible etiological and risk factors that may cause or lead to a radicular cyst's recurrence. Careful examination and sound knowledge regarding the radicular cyst's possible etiological factors are essential for successful outcomes and preservation of the natural teeth. As with the many lesions, the radicular cyst is also associated with diffuse swelling and their potential neoplastic transformation. A careful histopathological analysis should always accompany clinical and radiological examinations to achieve successful treatment outcomes.

CONFLICT OF INTEREST

Authors declare no conflicts of interest.

REFERENCES

1. Narula, H., Ahuja, B., Yeluri, R., Baliga, S., Munshi, A. K. Conservative non-surgical management of an infected radicular cyst. Contemporary clinical dentistry. 2011; 2(4): 368.
2. Nair, P. New perspectives on radicular cysts: do they heal? International endodontic journal. 1998; 31(3): 155-160.
3. Lin, L. M., Huang, G. T. J., Rosenberg, P. A. Proliferation of epithelial cell rests, formation of apical cysts, and regression of apical cysts after periapical wound healing. Journal of endodontics. 2007; 33(8): 908-916.
4. Yu, C., Abbott, P. V. Responses of the pulp, periradicular and soft tissues following trauma to the permanent teeth. Australian Dental Journal. 2016; 61: 39-58.
5. Galler, K. M., Weber, M., Korkmaz, Y., Widbiller, M., Feuerer, M. Inflammatory Response Mechanisms of the Dentine–Pulp Complex and the Periapical Tissues. International journal of molecular sciences. 2021; 22(3): 1480.
6. Moutsopoulos, N. M., Konkel, J., Sarmadi, M., Eskan, M. A., Wild, T., Dutzan, N., *et al.*, Defective neutrophil recruitment in leukocyte adhesion deficiency type I disease causes local IL-17–driven inflammatory bone loss. Science translational medicine. 2014; 6(229): 229ra240-229ra240.
7. Shi, Y., Wang, J., Cao, C. Clinical studies on pulpitis and periapical periodontitis caused by traumatic occlusion. Zhonghua kou qiang yi xue za zhi= Zhonghua kouqiang yixue zazhi= Chinese journal of stomatology. 1997; 32(1): 23-25.
8. Valois, C. R., Costa-Júnior, E. D. Periapical cyst repair after nonsurgical endodontic therapy: case report. Brazilian dental journal. 2005; 16(3): 254-258.
9. Shear, M., Seward, G. R. Cysts of the oral regions: John Wright; 1992.