BOHR International Journal of Current research in Dentistry
2023, Vol. 2, No. 1, pp. 48–51
DOI: 10.54646/bijcrid.2023.18
www.bohrpub.com

Radicular cyst management due to endodontic failure – a case study

Khalid Sheriff

Sheriff Dental Clinic, Hosur, India

*Correspondence:
Khalid Sheriff,
smiledental2016@yahoo.com

Received: 18 July 2023; **Accepted:** 19 October 2023; **Published:** 19 December 2023

Radicular cysts, also known as periapical cysts, are the most prevalent cysts affecting both the maxilla and mandible. They arise from epithelial residues in the periodontal ligament as a result of inflammation. In the present case, a 17-year-old male patient reported with pain and swelling in the upper front teeth region for the past 1 year which was diagnosed to be a radicular cyst in relation to 12 which was previously root canal treated. The treatment involved enucleation of the cyst and extraction of 12. The patient has no pain or other symptoms and is currently attending follow-up appointments following the procedure. This case report explains the process and treatment of the radicular cyst in this patient in detail.

Keywords: radicular cyst, periapical cyst, root canal therapy, enucleation, radiolucency, infection

Introduction

Radicular cysts, also known as periapical cysts, are the most prevalent cysts affecting both the maxilla and mandible. They are inflammatory jaw cysts which develop from the epithelial remnants of the periodontal ligament as a result of inflammation. The cyst also seems to be most commonly affecting the apex of the root of the involved tooth. The etiology of the cyst is multifactorial with most common ones being pulpal necrosis due to dental caries or failed endodontic treatment as seen in the present case.

A 17-year-old male patient presented to the clinic expressing their primary concern of experiencing pain and swelling in the upper anterior region for the past 1 year. When questioned, the patient revealed that he had pain and swelling for the past 1 year. The swelling was initially smaller in size and had grown bigger to the current size. The patient reported that the pain was intermittent in nature. He had consulted a local dentist regarding the problem for which he was prescribed medications. The pain subsided temporarily on medication.

The patient reported that he had undergone root canal treatment for the upper lateral incisor 1 year before and just immediately after, he started experiencing intermittent pain and the swelling started to appear in the labial aspect of upper right lateral incisor and gradually grew in size. There were no significant findings in the patient's medical health history and was not on medication for any ailments. The patient denied having any smoking and alcohol usage habits.

Examinations

The vitals of the patient were all found to be within normal limits. The clinical examination of the head and neck region revealed no abnormal findings. No palpable lymph nodes were detected. There were no abnormal extraoral findings noted.

On thorough intraoral examination, a localized round to pear shaped swelling was seen in the labial region of upper right lateral incisor, which was approximately 5 mm in diameter. Swelling was soft, fluctuant, inflamed, and tender on palpation.

On radiological examination (An IOPA), a large unilocular periapical radiolucency was noted involving the root of 12 and also revealed that the root canal done was not of best quality resulting in RCT failure and periapical cyst (see **Figure 1**).

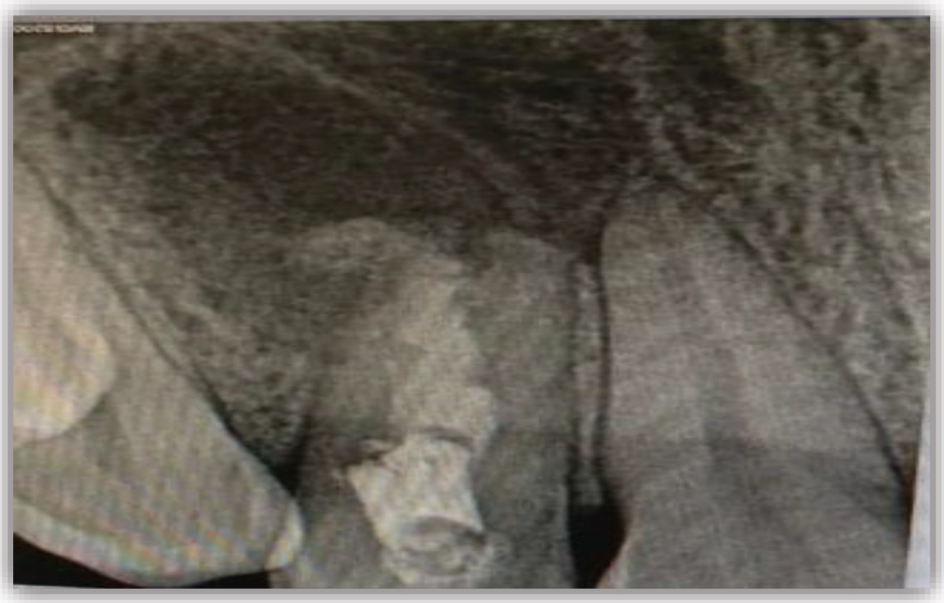

FIGURE 1 | IOPA indicated radicular cyst over a RCT failed Teeth.

FIGURE 2 | Extraction of 12 followed by enucleation of cyst.

Treatment plan

Based on the thorough clinical and radiological evaluation, a treatment plan was devised and subsequently explained to the patient, obtaining their informed consent. Surgery was scheduled for the next visit, which involved surgical enucleation of cyst along with extraction of 12 as shown in **Figure 2**.

Following local infiltration in the 12 region, extraction of 12 was done, after which a crevicular incision was made in the labial aspect of 11–14. A full thickness mucoperiosteal flap was then reflected, which exposed the bony defect underneath. This region then underwent a complete curettage involving scraping and removal of all granulation tissues. This was followed by the enucleation of cystic lesion. The flap was subsequently closed using 3-0 silk sutures to provide a tight closure and better healing.

The patient was provided with post-operative instructions and prescribed antibiotics and analgesics. The follow-up radiograph taken within 1 week of the surgery revealed noticeable signs of healing surgery as shown in **Figure 3**. On further follow-up, it was revealed that the patient is asymptomatic.

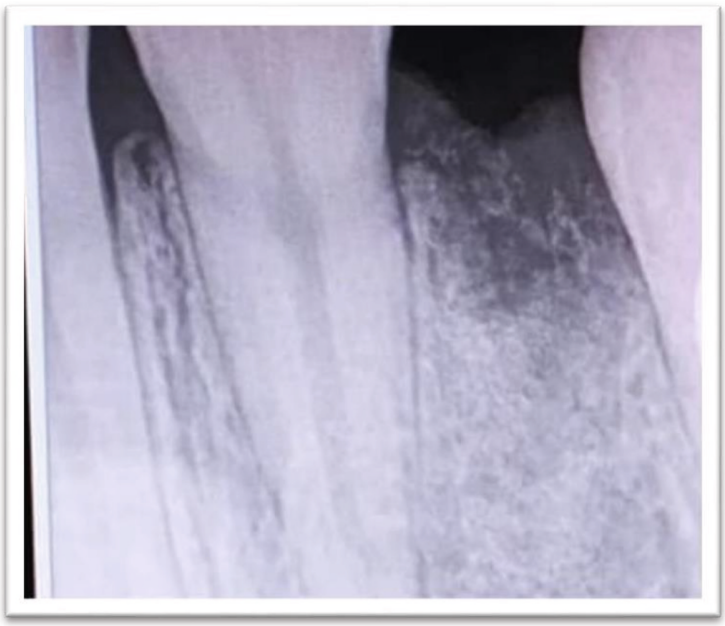

FIGURE 3 | Follow-up radiograph (within 1 week) showing appreciable complete healing of cyst

Discussion

Radicular cysts are the most prevalent cystic lesions occurring in relation to teeth usually resulting from chronic infection of the tooth (1). Approximately 50–70% off all the cysts occurring either in maxilla or in mandible are found be radicular cysts (2–4). The anterior region of the maxilla and the premolar region of the mandible are more prone to development of radicular cysts than the other parts of the jaw (1).

Radicular cysts are usually of three types namely periapical cyst, which occurs in the apex of the root, lateral radicular cyst, which occurs in the lateral aspect of the root corresponding to the opening of lateral accessory canals, and the residual cyst, which persists behind the bone even after extraction of the affected tooth. Clinically, it is usually seen as an enlargement in buccal or palatal aspect when occurring in maxilla and mostly seen as a buccal enlargement when occurring in mandible. Cortical expansion and root resorption are also some of the common clinical features that can be observed. Most often they are asymptomatic and only get diagnosed when taking a periapical radiograph of the affected tooth during routine clinical investigations unless they become infected. Radiographically, they generally appear as a round, unilocular, radiolucent lesions in the periapical region, usually measuring <1 cm (2).

The most common causes of the development of radicular cysts are inflammation due to trauma, dental caries, or a failed root canal therapy which ultimately results in the affected tooth becoming non-vital. Persistent chronic infection of the non-vital pulp may initiate the development of a periapical cyst (2, 5). In this case, the patient reported having undergone root canal treatment 1 year before, which unfortunately failed, making it the likely cause of the cyst.

The treatment for radicular cysts depends on the extent of the lesion. Localized and smaller cysts can be managed with the conventional non-surgical root canal therapy while lesions that are larger in size require surgical interventions such as enucleation, marsupialization, and decompression (1).

Considering the size and extent of the lesion, a conservative surgical approach was chosen for this patient. This approach basically involves only the infected tissue being removed, in contrast to procedures like En bloc resection where normal structures along with the diseased tissue will be removed. The choice of the treatment in any patient should be based on taking numerous factors into consideration such the size of the lesion, localization, and the cyst's relation to surrounding vital structures.

In this present case, the lesion was successfully enucleated along with the extraction of the affected tooth with a failed root canal treatment. The healing of the periapical area was successful and currently the patient is asymptomatic and attending regular follow-up appointments.

Conclusion

Most of the periapical cysts occurring either in mandible or in maxilla are being managed by non-surgical and minimally invasive methods such as root canal treatment of the affected

tooth. However, in few cases surgical intervention may be required to ensure successful outcomes. This is usually decided by taking into consideration the size of the lesion and the extent to which the lesion has spread and the surrounding vital structures. In this case, the periapical cyst was managed successfully by performing surgery along with extraction of the tooth involved.

Considering that the etiology of this cyst was the failure of the previously performed root canal treatment, it is essential to keep in mind these consequences during endodontic treatments. Paying close attention to details not only enhances the finesse of the endodontic procedures but also maximizes the success rate that results in a better prognosis. Regular follow-ups, at least annually, are crucial to evaluate the treatment's outcome and detect any recent changes.

Maintaining clinical thoroughness throughout the treatment phase can turn out to be advantageous for both the clinician and the patient in the long run. This approach could have prevented the RCT failure thus the cyst formation and the complications that accompany it.

Author contributions

The author confirms being the sole contributor of this work and has approved it for publication.

References

1. Rajendran A, Sivapathasundharam B. *Shafer's Textbook of Oral Pathology*. 6th ed. Amsterdam: Elsevier (2009). p. 487–90.
2. Kanipakam Y, Arumugam SD, Kulandairaj PL, Muthanandam S. Radicular cyst (periapical cyst): a case report. *J Sci Den.* (2019) 9:43–5.
3. Shear M. *Cysts of the Oral Regions*. 3rd ed. Bristol: Wright (1992).
4. Killey HC, Kay LW. *Benign Cystic Lesions of the Jaws, Their Diagnosis and Treatment*. Edinburgh: Churchill Livingstone (1977).
5. Nair PNR. New perspectives on radicular cysts: do they heal? *Int Endodontic J.* (1998) 31:155–60.