



MANAGEMENT OF RADICULAR CYST BY SURGICAL ENUCLEATION: CASE REPORT

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Abstract

The most frequent cystic lesions that affect the jaw are radicular cysts. They make up between 52% and 68% of all cysts that affect the human jaw, making them the most prevalent of all jaw cysts. They are typically asymptomatic, and regular radiologic examinations are used to diagnose them. Radicular cysts can be treated surgically, such as enucleation, marsupialization, or decompression, or conventionally nonsurgically with root canal therapy when the lesion is small. The effective surgical treatment of a sizable infected radicular cyst that was connected to a maxillary lateral incisor is described in this case report.

Keywords: Cystic enucleation, Radicular cyst, Surgical

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1. Introduction

For teeth with periapical lesions that do not react well to conventional root canal therapy or when orthograde treatment is not an option, surgical endodontics is an effective way of correction.¹ When conservative instrumental, pharmacotherapeutic, and physiotherapeutic therapies failed, it helps to retain the shape, functionality, and aesthetics of the relevant teeth and their roots.

The main goals of a surgical approach are to completely debride the root canals, make them free of diseased necrotic tissue, and then seal any cavities or defects to stop the spread of microorganisms to the periradicular tissues and create an environment that is favourable for a normal periodontal apparatus regeneration. By performing root-end resection, preparing the root-end cavity, and closing the apical end of the root canal system with a retrograde filling, this objective should be achieved. Additionally, curettage is crucial for the debridement of the periapical diseased tissue in order to get rid of any extra-radicular infections, foreign bodies, or cystic tissue.² Thus this case report aims to highlight a clinical case of surgical treatment of periapical radiolucency with history of trauma.

Case Report

A 29-year-old female patient reported to the Department of Conservative Dentistry and Endodontics, Bharati Vidyapeeth Dental College and Hospital, Pune, with chief complaint of pain, recurrent swelling, and pus discharge from the upper right front tooth region of the jaw. Patient notified a history of trauma in upper anterior teeth, which had occurred 4 years back. Intraoral clinical examination revealed a round to oval swelling which was located over labial mucosa of maxillary anterior region in association with 12. Swelling was soft, localized, fluctuant, inflamed and nontender. Spontaneous pus discharge was seen from sinus tract. Ellis class IV fractures of 12 with slight discolouration were also seen (Figure 1).

Electric and thermal pulp vitality testing showed negative responses in 11 and 12. All teeth were non-tender to percussion test. An IOPA was taken, which revealed a unilocular radiolucent lesion which involved periapical region of 12 (Figure 2a). Patient was subjected to CBCT examination which showed well defined unilocular radiolucency with sclerotic borders in apical region of 12 approximately measuring 8.4mm in diameter. It also revealed perforation of buccal cortex and root resorption w.r.t. 12 and ill-defined radiolucency with loss of lamina dura with respect to 11 (Figure 2b).

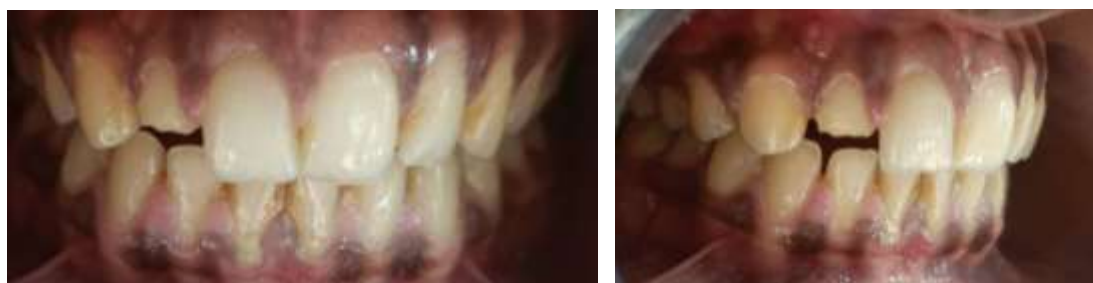
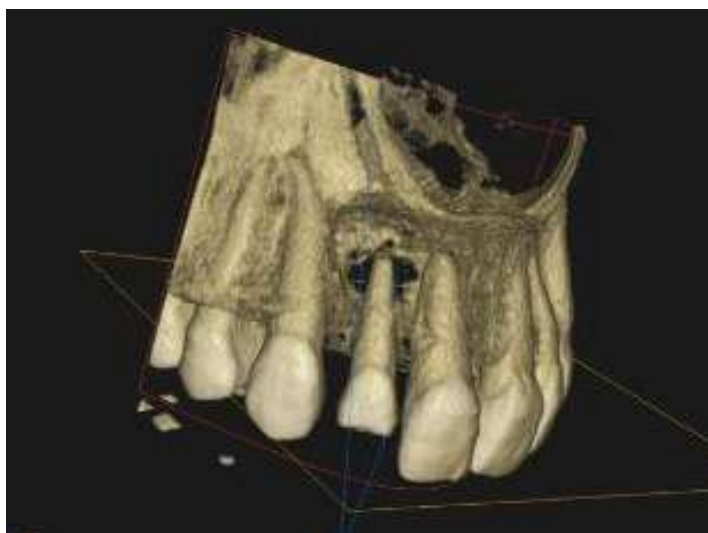


Figure 1: Preoperative Intraoral picture



a)

b)

Figure 2: Preoperative radiographic examination; a) IOPA image b) CBCT image showing the extent of the lesion

From the history, clinical examination and investigation, a provisional diagnosis of infected radicular cyst in 12 and periapical abscess in 11 was made.

Treatment plan

Root canal treatment with respect to 11 12 followed by cystic enucleation of periapical cyst with respect to 12 was formulated and after explaining it to the patient, his informed consent was taken.

Therapeutic Interventions

Root canal opening with 11 and 12 was done under rubber dam application (Figure 3a). Pus discharge was seen with 12 after access opening. After determination of working length and biomechanical preparation, calcium hydroxide intracanal medicament was used for two weeks. Then, in next appointment, obturation was completed (Figure 3b and 3c).



a)

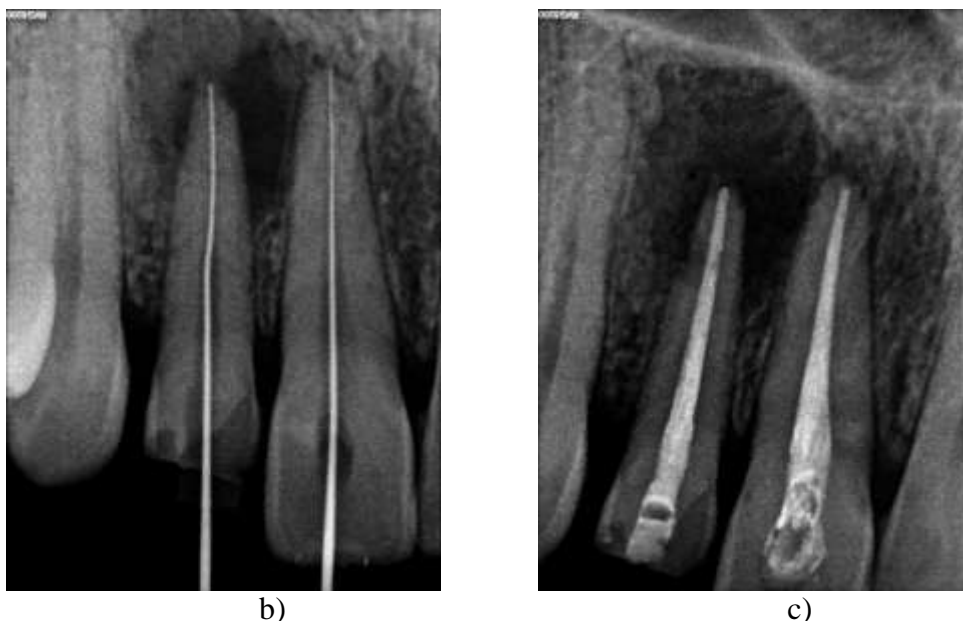


Figure 3: a) Access opening under rubber dam isolation; b) Working length determination; c) Obturation

Surgical Intervention

After mouth preparation with povidine iodine rinse and swab, local anesthesia (2% lidocaine with 1: 100,000 epinephrine) was administered. Using 15c blade and bard parker handle, a sharp incision was made deep into bone. A sulcular incision in addition to two vertical releasing incisions were given, and a full-thickness mucoperiosteal flap was raised and a large bony defect with respect to 12 was seen clinically (Figure 4a). A round carbide bur under constant irrigation for cooling was used to enlarge bony defect to the buccal window to gain access to the periapical lesion and root end of the tooth with defect. Curettes were then used to

a)



b)

remove the soft granulation tissue, which further aided in adequate visualization of root apex. Hemostasis was achieved with the use of sterile gauzes. Enucleation of cystic lesion was done and it was sent for histopathological evaluation (Figure 4b). Root end of 12 was cold burnished (Figure 4c). Careful evaluation and copious irrigation with normal saline of the surgical field was done to ensure complete debridement of a hemostatic agent, root-end filling material, and debris, which may hinder the process of healing. A damp gauze piece was slightly compressed to bring back the flap in position. Single interrupted sutures were given and flap closure was done with 3-0 silk (Figure 4d).



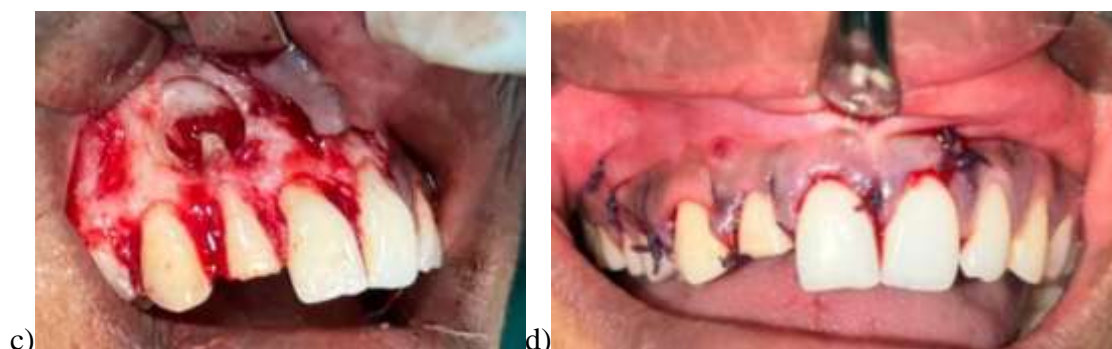


Figure 4: Surgical pictures (a) full thickness flap elevated with visualization of defect; (b)&(c) Removal of cyst and granulation tissue; (d) After placement of 3-0 Silk sutures
The histopathology report confirmed the provisional diagnosis of an infected radicular cyst. Post-operative instructions were given to the patient and patient was kept on antibiotics and analgesics. Currently, the patient is asymptomatic and he is under follow-up since 1 year (Figure 5). Follow-up radiograph showed appreciable healing.



Figure 5: Follow-up radiographs showing appreciable healing of the lesion (a and b) IOPA's after 1 year of follow-up

2. Discussion

The term, 'cyst' is derived from the Greek word, 'Kystis', meaning, 'sac or bladder'.³ Cyst is defined as a pathological cavity that is usually lined by epithelium and which has a centrifugal, expansive mode of growth.⁴

Radicular cysts make up between 52% and 68% of all cysts that affect the human jaw, making them the most prevalent of all jaw cysts.^{5,6} They develop from epithelial remnants that have been induced to proliferate as a result of an inflammatory process that begins with the pulpal

necrosis of a tooth that is no longer viable. A non-vital tooth that is left in place for long enough to develop chronic periapical pathosis is the first event in the natural history.⁷ They are typically located near the apices of the teeth that are affected. In respect to lateral auxiliary root canals, they can also be present on the lateral portions of the roots.⁸ They have no symptoms, and regular radiologic examinations are used to diagnose them. Traditional nonsurgical root canal therapy is used to treat radicular cysts when the lesions are localised, and surgical procedures such enucleation,

marsupialization, or decompression are used when the lesions are big.⁹

Endodontic treatment was performed in the present patient over the course of several sessions with interim calcium hydroxide dressings. When treating teeth with chronic periapical lesions with root canal therapy, it's important to use root canal dressings in between sessions to reduce bacterial levels more effectively than with mechanical preparation, especially by penetrating areas that are inaccessible to instruments or irrigation fluids, like dentinal tubules and ramifications. Due to its hygroscopic qualities, calcium hydroxide has also demonstrated therapeutic effectiveness in decreasing exudate. According to studies, the bactericidal activity of calcium hydroxide requires at least two weeks.¹⁰ Then, in the subsequent appointment, obturation was completed.

Conservative surgical procedure was planned because of the lesion's size. As opposed to techniques like En bloc resection, which removes the healthy structure along with the diseased tissue, the conservative method only removes the infected tissues. Enucleation or marsupialization are the two surgical options for jaw cystic lesions. The preferred course of treatment depends on the lesion's size and location, the cystic wall's bone integrity, and its closeness to important structures.

Patient was prepared for surgery in next visit, which included surgical enucleation of cyst and cold burnishing of gutta percha at apical end of involved tooth. After administration of local anaesthesia, crevicular incision was made in labial region 14 to 21. A full thickness mucoperiosteal flap was reflected and a large bony defect with respect to 12 was seen clinically. Complete curettage, along with granulation tissue removal and enucleation of cystic lesion was done and it was sent for histopathological evaluation. Root end of 12 was cold burnished with a burnisher and flap closure

was done with 3-0 silk. Post-operative instructions were given to the patient and patient was kept on antibiotics and analgesics.

The time following surgery was uneventful. The presented lesion's histological characteristics supported the clinical conclusion that it was an infected radicular cyst. Nonkeratinized, stratified squamous epithelium lined the cystic cavity, and there was mixed inflammatory infiltration present. The patient was scheduled for post and core treatment followed by crown prosthesis. The patient, however, was uninterested in the rehabilitative component of the therapy because of budgetary limitations.

Currently, the patient is asymptomatic and he is under follow-up since 1 year. Follow-up radiograph showed appreciable healing.

3. Conclusion

Assessment and follow-up care for apicoectomy treatments have significantly improved thanks to modern understanding of endodontic concepts for success and failure. Endodontists may now treat difficult situations with a great deal more efficiency thanks to improvements in apicoectomy instruments and supplies. The apicoectomy procedure that was used in this instance was appropriate, and the outcomes were satisfactory. Since traditional, nonsurgical endodontics cannot preserve the tooth, apical surgery is a predictable choice.

4. References

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