



**Research Article**

**CYST ENUCLEATION FOLLOWED BY APICECTOMY: WHAT ELSE CAN BE A BETTER OPTION FOR FAILED ROOT CANAL TREATMENT!**

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**ABSTRACT**

Apicectomy along with cyst enucleation is typically done as a retreatment strategy in case of failed non-surgical root canal therapy which has associated cyst. Several factors such as a complex root canal system or past procedural mishaps may hinder the accomplishment of non-surgical retreatment. Radicular cysts are generally symptomless unless infected and are diagnosed during routine radiographic examination. The treatment of radicular cyst includes traditional non-surgical root canal therapy when lesion is localized or surgical treatment like enucleation, marsupialization or decompression when the lesion is large.

This case report presents the successful surgical management of a large infected radicular cyst which was associated with maxillary central and lateral incisor.

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**INTRODUCTION**

Apical surgery procedure is often the last hope to save an endodontically treated tooth with a periapical lesion. Several factors, such as a complex root canal system, apical root calcifications, broken endodontic file at the apex, non-healing periapical lesion may impede the success of non-surgical retreatment. In these cases, periradicular surgery and apicectomy would be the treatment of decision to safeguard the tooth.

An apicectomy was all around characterized in 1884 by J. Farrar as “a bold act, which removes the entire cause and which will lead to a permanent cure, may not be the best in the end, but the most humane.” According to Black (Black 1886) the root-resection technique began as a treatment for “pyorrhea alveolaris” complicated by a dental abscess in the late long periods of the nineteenth century as a substantial option in contrast to a dental extraction. It appears that the primary treatment appropriately depicted was performed on a 14-year-old boy in 1846, accessing to the root with a trephine and a bur mounted on the dental engine to drill away the area of inflamed/infected tissue (Ojha and G.D, 1961). After this, within a couple of years, a progressively radical method of complete excision of the root apex was performed and ached.

Periapical cysts are inflammatory jaw cysts that show up at the apices of infected teeth with necrotic pulps. It involves both the primary and permanent dentition with a scope of 0.5%–3.3%. They are more common in males contrasted with females with a proportion of 1.6:1(Nair and P.N., 1998).

The radicular cyst is the most well-known inflammatory cyst in the jaw that is of odontogenic origin (Marx *et al*, 2012). The cyst is accepted to be originated from the epithelial cell rests of Malassez (Nair and P.N., 1998). It is typically associated with a tooth having a necrosed pulp. The lesion is seen mostly in the males during their third and fifth decades of life (Joshi *et al*, 2011). Treatment of radicular cyst relies upon the size of the lesion and can be treated with a simple conventional therapy or may require a surgical intervention.

**Case Report**

A 41-year-old female patient reported to our department with chief complaint of swelling in the upper front region of jaw since one month. Patient reported history of trauma in upper anterior teeth about two years back. Patient had visited department of Endodontics one year ago. Root canal treatment was done with 21 and 22. Intraoral clinical assessment revealed a swelling which was located over labial mucosa of maxillary anterior region in association with 21 and 22. Swelling was soft, localized, fluctuant, inflamed and non-tender. Spontaneous pus discharge was seen from gingival crevices of 21 and 22. Electric and thermal pulp vitality testing indicated negative reactions in 21 and 22. All teeth were non-tender to percussion test. An IOPA was taken, which revealed an enormous unilocular radiolucent lesion which involved periapical regions of 21 and 22. There was no evidence of root resorption but displacement of the central and lateral incisor was noted.

**Surgical Procedure**

Patient was retreated endodontically before the surgical procedure. After administration of local anaesthesia and under

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all aseptic precautions, crevicular incision was made in labial region from 13 to 23 with a releasing incision distal to 13. A full thickness triangular mucoperiosteal flap was reflected and a large bony defect with cystic lining was seen clinically. Complete enucleation and curettage of cystic lesion was done [Fig-1]. Lesion removed was around 4\*2 cm in dimensions [Fig-2]. Apical third of 21 and 22 was removed with bur and handpiece for about 2 mm in an oblique fashion. Gutta-percha which was visible after apicectomy was sealed and compacted into the canal with hot burnisher. Sharp bony edges of the cavity margins were smoothed after the enucleation, irrigated and cleansed thoroughly with pure Betadine and the wound was sutured with non-absorbable suture material.



**Fig 1** Enucleation: Cyst enucleation was done in toto without leaving the cystic lining in the cavity



**Fig 2** Cystic lesion: A kidney shaped cystic lesion removed was sent for histopathological diagnosis

## DISCUSSION

The most frequent cystic lesion influencing human jaws is the radicular cyst with a rate ranging from 52% to 68% (Uloopi *et al*, 2015). It can occur in relation with all locations of the jawbone but more common in the maxilla (Nair and P.N., 1998; Rees and J.S., 1997). The etiology is the infection of the periradicular space either because of trauma or caries, usually sterile unless it is secondarily infected (Narula *et al*, 2011).

The infection spreads to the tooth apex of the root, causing periapical periodontitis, which prompts either an acute abscess or a chronic granuloma. Tenacious chronic infection can lead to development of a periapical cyst (Weber *et al*, 2003). In the present case, patient had given a history of trauma previously; it could be the plausible etiology. Cortical expansion, root resorption of the affected tooth and displacement of the adjacent teeth are common features of radicular cysts (Weber *et al*, 2003). In the current case, there was cortical perforation and adjacent teeth in relation to the cyst were non-vital, which is not common. It has been stated that as the cyst enlarges, adjacent teeth can become non-vital (Andersson *et al*, 2012).

There are different opinions advanced for clarifying the formation of this cyst. Torabinejad (1983) depicted the pathogenesis of radicular cyst according to the “breakdown/nutritional deficiency hypothesis” and “abscess cavity hypothesis.” The “breakdown” hypothesis suggests that after provocation, the epithelial cells continue to proliferate following which the central cells become deprived of nutrition from the surrounding connective tissue and undergo liquefactive necrosis, prompting the development of a microscopic cyst. According to the “abscess cavity” hypothesis, the epithelial cells proliferate and line a pre-existing cavity (abscess) as a result of their characteristic inclination to cover exposed connective tissue surfaces. This hypothesis was additionally bolstered by McConnell (McConnell and G., 1921). Another hypothesis suggested that the cyst formation was because of an immediate after-effect of epithelial proliferation around a space caused by proteolytic activity occurring in the connective tissue (Nair and P.N., 1998). However, the most acknowledged theory is the epithelial breakdown theory as also supported by previous articles (Nair and P.N., 1998; McConnell and G., 1921). The pathogenesis of radicular cysts can be additionally portrayed under three distinct phases, namely, the phase of initiation, the phase of cyst formation, and the phase of enlargement (Jansson *et al*, 1993).

The treatment of the radicular cyst depends on the size and confinement of the lesion (Bodner and L., 2002). It can be treated with endodontic therapy, extraction, surgical procedure such as enucleation, and marsupialization (Joshi *et al*, 2011).

## CONCLUSION

Enucleation and apicectomy of the involved roots of the teeth is the best option for large periapical lesions in failed root canal treatment.

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## References

- Andersson, L., Kahnberg, K.E. and Pogrel, M.A. eds., 2012. *Oral and maxillofacial surgery*. John Wiley & Sons.
- Black CV., 1886. Amputation of the roots of teeth. In: Litch WF, editor. *The American system of dentistry*. Philadelphia: Lea Brothers; 1886. pp. 990-2.
- Bodner, L., 2002. Cystic lesions of the jaws in children. *International journal of pediatric otorhinolaryngology*, 62(1), pp.25-29.

- Jansson, L., et al., 1993. "Development of Periapical Lesions." *Swedish Dental Journal*, vol. 17, no. 3, pp. 85-93.
- Joshi, N.S., Sujan, S.G. and Rachappa, M.M., 2011. An unusual case report of bilateral mandibular radicular cysts. *Contemporary clinical dentistry*, 2(1), p.59.
- Marx, R.E. and Stern, D., 2012. *Oral and maxillofacial pathology: a rationale for diagnosis and treatment*. Hanover Park, IL: Quintessence Pub. Co.,.
- McConnell, G., 1921. The histo-pathology of dental granulomas. *The Journal of the National Dental Association*, 8(5), pp.390-398.
- Nair, P.N., 1998. New perspectives on radicular cysts: do they heal?. *International endodontic journal*, 31(3), pp.155-160.
- Narula, H., Ahuja, B., Yeluri, R., Baliga, S. and Munshi, A.K., 2011. Conservative non-surgical management of an infected radicular cyst. *Contemporary clinical dentistry*, 2(4), p.368.
- Ojha, G.D., 1961. The historical changes in the tooth and surrounding structure following apicoectomy in dogs.
- Rees, J.S., 1997. Conservative management of a large maxillary cyst. *International endodontic journal*, 30(1), pp.64-67.
- Torabinejad, M., 1983. The role of immunological reactions in apical cyst formation and the fate of epithelial cells after root canal therapy: a theory. *International journal of oral surgery*, 12(1), pp.14-22.
- Uloopi, K.S., Shivaji, R.U., Vinay, C., Shrutha, S.P. and Chandrasekhar, R., 2015. Conservative management of large radicular cysts associated with non-vital primary teeth: a case series and literature review. *Journal of Indian Society of Pedodontics and Preventive Dentistry*, 33(1), p.53.
- Weber, A.L., Kaneda, T., Scrivani, S.J. and Aziz, S., 2003. Jaw: cysts, tumors, and nontumorous lesions. *Head and neck imaging*, 4th edn. Mosby, St. Louis, pp.930-994.

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