

Effective Management of Radicular Cyst by Surgical Enucleation: A Case Report

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ABSTRACT

Background: Radicular cysts are common odontogenic cysts. It involves the apex of carious tooth. It is also called a true cyst, since the lesion consists of pathologic cavity lined by epithelium and is often fluid filled. Radicular cyst which persists after or develops subsequent to extraction is termed as residual cyst. Cyst can be managed surgically and/or non-surgically. Choice of treatment depends on site and size of the cyst. The present case, characteristic radicular cyst, was successfully managed with root canal therapy (RCT) along with surgical enucleation.

Keywords: Radicular cyst, Surgical enucleation.

INTRODUCTION

Cyst is defined as a pathologic epithelium lined cavity usually containing fluid or semi-solid material. Odontogenic cysts are derived from the epithelium associated with the development of dental apparatus. Several types of cyst may occur depending on the stage of odontogenesis during which they originate.(1)Odontogenic cysts are derived from:

- 1) Tooth germ
- 2) Epithelial rests of Malassez
- 3) Reduced enamel epithelium of a tooth crown
- 4) Remnants of dentallamina or
- 5) Possibly the basal layer of oral epithelium.

Radicular cyst is one of the most common odontogenic cystic lesions of inflammatory origin, arising from epithelial residues in periodontal ligament as a result of inflammation.(2) Periradicular surgical practise is done for the treatment or prevention of periradicular

pathologies. Conventional endodontic treatment is generally a successful procedure; however, in 10% to 15% of cases the symptoms can persist or spontaneously recur. Findings such as a draining fistula, pain on mastication, or the incidental noting of a radiolucency increasing in size indicate problems with the initial endodontic procedure. Surgery then becomes an important part of treatment in such cases.(3,4)

A residual dental (or radicular) cyst arises from epithelial remnants stimulated to proliferate by an inflammatory process originating from pulpal necrosis of a non-vital tooth that is no longer present.(5) The natural history begins with a non-vital tooth which remains in situ long enough to develop chronic periapical pathosis such as a dental(radicular) cyst. Over the years, the cyst may regress, remain static or grow in size.(6)

The lesion is not clinically detectable when small but most often is discovered as an incidental finding on radiographic survey. Two techniques can

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be used in clinical practice for surgical removal of cysts enucleation and marsupialization.(2) Radiographically, the classic description of the lesion is a round or oval, well circumscribed radiolucent image involving the apex of the infected tooth.(5)

CASE REPORT

A 22-year-old male patient visited the Department of Conservative Dentistry and Endodontics with a chief complaint of a swelling in upper front side of face since 1 month with discoloration of tooth in respect to 11 and 12. Patient had a history of trauma in relation to 11 while playing around 5 years ago (Fig 1). Radiographic examination showed a well-defined unilocular radiolucency in relation to the right maxilla in the 11 and 12 regions. (Fig 2).



Fig 1: Preoperative photograph.

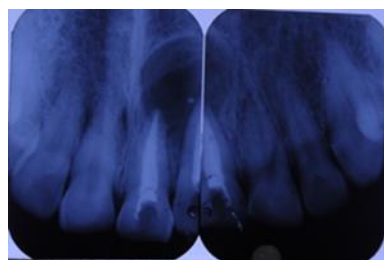


Fig 2: Preoperative radiograph after root canal treatment.

On extraoral examination a diffuse swelling was present involving the upper front region of the face. On intraoral examination a diffuse swelling was observed extending from 11 and 12, there was no mobility of the involved teeth. Surface discharge was seen from labial aspect of both 11 and 12. Electrical pulp testing revealed that 11 and 12 were nonvital, 13 and 14 were asymptomatic and responded normally to electric pulp testing. A

provisional diagnosis of radicular cyst was made. Root canal treatment was carried out in relation to 11 and 12. The surgical procedure was carried out under local anesthesia (infraorbital nerve block, nasopalatine nerve block and local infiltration). Vestibular incision was placed with releasing margins and mucoperiosteal flap was raised. (Fig 3.)



Fig 3. Vestibular incision

A plane of cleavage was established between cystic epithelial lining and surrounding bone (Fig 4.). The whole cystic lesion was enucleated and curettage was done (Fig. 5).



Fig 4. Complete cystic cavity.

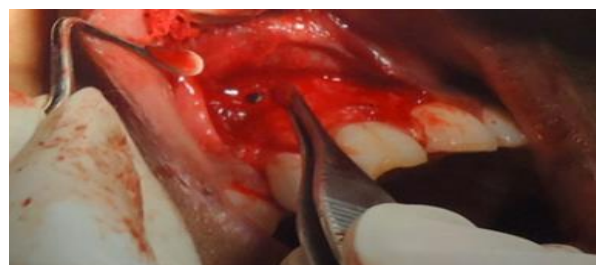


Fig 5: Curettage of the cystic cavity

Primary closure of the cystic cavity was done with mercesilk 3-0 non resorbable through

simple interrupted suturing. Pack was placed as drain in the buccal region. The drain was placed which was removed after 48 hours. Post operative instructions were given. Wound healed uneventfully and the patient was followed up after 6 months (Fig 6.).



Fig 6: Postoperative radiographic follow up after 6 months

TISSUE CULTURE

The excised tissue was sent for histopathological examination which showed a lining epithelium, a cystic cavity and a fibrous capsule. The lining epithelium was stratified squamous and non-keratinized. The connective tissue was fibrous with dense infiltrate of inflammatory cells. The diagnosis of radicular cyst was confirmed.

DISCUSSION

The radicular cyst is most common odontogenic cyst also called as periapical cyst, apical periodontal cyst and root end cyst. These cysts comprise about 52-68% of all the cysts affecting the human jaw. The usual etiology is an infected tooth, leading to the necrosis of the pulp.(4) Occur more commonly between third and fifth decades, more common in males than in females, and more frequently found in the anterior maxilla than other parts of oral cavity.(10) Simon discovered two distinct types of radicular cysts, namely those containing cavities completely enclosed in epithelial lining or true cysts, and those containing epithelium-lined cavities that are open to the root canals.(7)

Pathogenesis of radicular cysts has been described as comprising of three distinct phases: the phase of initiation, the phase of formation and the phase of enlargement.(11) Most radicular cysts develop slowly and do not become very large cavities. Patients do not experience pain unless

inflammatory exacerbation is present. Large cysts may lead to mobility and not respond to electrical pulp test in affected tooth.(8) Histopathologically it shows cystic lumen, lined with a thin epithelial lining supported by a fibrocellular connective tissue stroma, showing dense chronic inflammatory cell infiltrate with few cholesterol clefts.(2) The treatment of these cysts are still under discussion and many professionals opt for a conservative treatment by means of endodontic technique (Hoen, 1990; Rees, 1997).(12)

However, in large lesions the endodontic treatment alone is not efficient and it should be associated to a decompression or a marsupialization or even to enucleation (Neaverth; Burg, 1982; Hoen Et Al, 1990; Rees, 1997; Danin 1999). In this regard, it is suggested that the treatment of the apical periodontal cysts should be defined according to the clinical and x-ray evaluations according to each case.(13)

Enucleation is defined as the complete removal of the cystic lining with healing by primary intention while marsupialization is synonymous with Partsch's operation and is the conversion of cyst into a pouch. It requires considerable after care and patient cooperation in keeping the cavity clean whilst it resolves and heals by relieving the internal pressure, it is indicated when cyst is in close proximity to vital structures and where there is significant risk of injury with enucleation.(9) The endodontic treatment was carried out in multiple visits with interim calcium hydroxide dressings. The use of root canal dressings between sessions in root canal treatment of teeth with chronic periapical lesions is important for reducing bacteria beyond levels obtained with mechanical preparation, particularly by penetration of areas that are unreachable by instruments or irrigation solutions, such as dentinal tubules and ramifications. Calcium hydroxide has also shown clinical efficiency in reducing exudate due to its hygroscopic properties.(5)

Takahashi et al. (14), analyzing the pH and the concentration of calcium ions in the periapical area, concluded that at least 2 weeks are necessary for calcium hydroxide bactericidal activity. Thus the treatment of choice is dependent on the size and

localization of the lesion, the bone integrity of the cystic wall and its proximity to vital structures.

CONCLUSION

The clinical case reported in this presentation was managed successfully by endodontic therapy with emphasis on thorough debridement, disinfection and three dimensional obturation of the root canal system which was followed by surgery.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Harshitha KR, Varsha VK, Deepa. C. Radicular cyst- A case report. *International Journal of Applied Dental Sciences* 2015; 1(4): 20-22
2. Kumar JA, Achuthan N, Loganathan K, Augustine D. Effective Management of a Large Radicular Cyst with Surgical Enucleation. *Oral Maxillofac Pathol J* 2014;5(1):459-461.
3. A Textbook of Advanced Oral and Maxillofacial Surgery Volume 2.
4. Aslan M, Simsek G. Large residual dental cyst- a case report. *The Journal of the Dental Faculty of Ataturk University* 2002;12:45-49.
5. Verghese George M., George Thomas, M. A. Kuttappa, Girish Kumar Govind. Management of A large periapical cyst (apical matrix and surgical complications)- A case report. *Endodontology*.2009;21(2):82-87.
6. Massive residual dental cyst: Case report George Dimitroulis, John Curtin, *Australian Dental Journal*.1998;43:(4).
7. Nair PNR. Review new perspectives on radicular cysts: do they heal? *International Endodontic Journal*.1998;31:155-160.
8. Delbem ACB, Cunha RF, Vieira AEM, Pugliesi DMC, Conservative treatment of a radicular cyst in a 5-year old child: a case report. *International Journal of Pediatric Dentistry*.2003;13:447-450.
9. Sakkas N, Shoen R. Obturator after marsupialization of a recurrence of a radicular cyst of the mandible. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007;103:16-18.
10. Joshi. N, Sujan S, Rachappa M. An unusual case report of bilateral mandibular radicular cysts. *Contemporary Clinical Dentistry* 2011; 2(1):59-62.
11. Jansson L, Ehnevid H, Lindskog S, Blomlöf L. Development of periapical lesions. *Swedish Dental Journal* 1993; 17(3):85-93.
12. Ribeiro, Paulo Domingos Jr. et al. Surgical approaches of extensive periapical cyst. Considerations about Surgical technique *Salusvita, Bauru*.2004;23(2):317-328.
13. Caroline R.A. Valois Edson Dias Costa Júnior. Periapical Cyst Repair After Nonsurgical Endodontic Therapy - Case Report. *Braz Dent J*.2005;16(3): 254-258.
14. Leonardo et al. Calcium Hydroxide Root Canal Dressing Histopathological Evaluation of Periapical Repair at Different Time Periods. *Braz Dent J* (2002) 13(1): 17-22.