

Case Report Of Two Giant Radicular Cysts

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Abstract:

Radicular cysts are the most common odontogenic cyst found in oral cavity accounting for more than 50% of the total odontogenic cysts. They usually remain asymptomatic unless and until it becomes larger in size. In some cases, small radicular cysts get diagnosed during routine radiographs and such small lesions can be managed conservatively by endodontic treatment whereas large radicular cysts needs surgical intervention post root canal treatment. In this article we have reported two such cases of giant radicular cysts (one in maxilla and mandible each) which were treated effectively by means of root canal treatment followed by surgical enucleation and showed significant healing postoperatively.

Key Word: Radicular cyst, Enucleation, Apicoectomy, Cell rest of Malassez.

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I. Introduction

The cyst was defined by Kramer as a pathological cavity containing a fluid, semi-fluid or gaseous content that is not created by the accumulation of pus and is frequently but not always lined by an epithelium [1]. Cysts of jaws are classified as odontogenic and non odontogenic cysts. The odontogenic cysts are derived from the tooth forming apparatus such as tooth germ, cell rests of serres, cell rests of malassez, reduced enamel epithelium or the basal layer of the epithelium [2]. Radicular cyst, the most common cystic lesion of jaws is found in apical region of the tooth. They also present on the lateral aspect of the tooth involving the accessory canal [3]. This contribute to about 52% to 68% of all the cyst affecting the jaws [4]. The prevalence of the cysts are more in the third decade of life [3,4]. The tooth with infected or necrotic pulp often present with radicular cyst [5]. The inflammatory stimulation and proliferation of the epithelial cell rests of malassez present in the periodontal ligament results in the formation of a radicular cyst [6]. Radiographically, radicular cyst appears as a unilocular radiolucency with a circumscribed sclerotic border [3,7]. Smaller lesions are treated conservatively by root canal treatment and larger lesions were treated by biopsy of the lesion, marsupialization and / or enucleation [3,5]. The objective of our case report is to describe the clinical presentation and management of large radicular cysts of maxilla and mandible.

II. Case Report 1

A 23 year old male patient reported with the chief complaint of pain and swelling in the upper front tooth region for past 2 months. Patient gave a history of trauma to the upper front tooth region 15 years back and for which no treatment was taken. The swelling gradually increased to attain the present size, which caused discomfort. On extraoral examination, no abnormalities detected and lymph nodes were not palpable. Intraoral examination revealed Ellis class IV fracture of 21 with discoloration present (Fig 1). A single diffuse palatal swelling which was around 2.5x2.5cm, soft in consistency, fluctuant, non tender on palpation, with no sinus opening and the mucosa over the swelling was normal. The swelling extends from 12 to 25 region. Electric pulp testing showed negative response in 11,21,22,23 and 24, while 12 showed a delayed response. All the teeth were non tender on percussion except 21, which was tender on percussion. OPG revealed a unilocular radiolucent lesion involving the periapical region of 11,21,22,23and 24 (Fig 2). From the clinical examination and radiographic interpretations, a provisional diagnosis of radicular cyst was made.

Treatment was planned, explained to the patient and informed consent was taken. Root canal access opening was done in 12,11,21,22,23 and 24. Biomechanical preparation done and calcium hydroxide intra canal medication was used for 2 weeks. Obturation done and patient was prepared for the surgical enucleation and apicoectomy.

Under local anaesthesia, crevicular incision was made buccally from 13 to 25 region, vertical relieving incision was given in 13 and 25 regions and a full thickness mucoperiosteal flap was elevated. A bony defect was noted in the buccal aspect of 22, 23 region. The lining was curettaged and complete enucleation done. The apical root ends were resected in relation to 12,11,21,22,23 and 24 (Fig 3). The enucleated lining was sent for histopathological evaluation. Hemostasis was achieved and flap repositioned. Interdental suturing was done with 3-0 vicryl (Fig 4). Post operative instruction were given and patient kept under antibiotics (Amoxiclav 625mg & Metronidazole 400mg) and analgesics (Aceclofenac 100mg & paracetamol 325mg) for 5 days. Patient was followed up for a period of 6 months and follow up radiographs showed acceptable healing. Patient was asymptomatic in all the further follow ups.

Histopathology report shows connective tissue stroma with dense diffuse chronic inflammatory cell infiltrate predominately composed of lymphocytes and plasma cells. Numerous dilated blood vessels with few areas of haemorrhage were seen. Few areas showed the presence of cholesterol clefts. Suggestive of Radicular cyst and confirmed the provisional diagnosis.



Fig 1: Intra oral pre op photograph



Fig 2: Pre op OPG



Fig 3: Intra op photograph



Fig 4: Suturing



Fig 5: 6 months post op OPG

III. Case Report 2

A 25 year old male patient reported with swelling in right and left lower front tooth region since 3 months. Patient gave a history of swelling which was smaller in size initially and have gradually increased to attain the present size, swelling is not associated with pain and also no known history of trauma. On extra oral examination no abnormalities detected. Intraorally solitary swelling noted periapically in relation to alveolar mucosa of 32 to 43 region. Obliteration of mandibular labial vestibule noted. Mucosa over the swelling is normal, no discharge noted. Ellis class II fracture noted in 31. On palpation, swelling is hard in consistency, not tender. No tenderness noted on percussion. Electric pulp testing showed negative response in 31,32,33,41,42,43. Radiographically, a well defined periapical unilocular radiolucency seen extending from 33 to 43, superiorly extending upto interradicular bone upto middle 3rd of root region and inferiorly upto 5mm above the inferior border of mandible (Fig 7). On the basis of radiological and clinical findings, provisional diagnosis of radicular cyst was made. Root canal treatment was completed from 33 to 43 region followed by 2 weeks of intra canal medication, and then patient was planned for surgical enucleation.

Under Local anesthesia, crevicular incision from 34 to 44 region and 2 vertical releasing incisions one in 34 and one other in 44 region was placed, full thickness mucoperiosteal flap was elevated, reflection done. Bony defect noted in 41,42 region (Fig 8). Defective bone were removed and with the bony window created, cyst lining was curetted and complete enucleation was done. Root ends were resected in relation to 31,32,33,41,42,43 (Fig 9). Enucleated lining was sent for histopathological investigation.

Hemostasis was achieved and flap repositioned. Interdental suturing was done with 3-0 vicryl (Fig 10). Post operative instructions were given to the patients and patients kept under antibiotics (Amoxiclav 625mg & Metronidazole 400mg) and analgesics (Aceclofenac 100mg & paracetamol 325mg). Patient was followed up for a period of 6 months and follow up radiographs showed satisfactory healing (Fig 11).

Histopathology report showed a non keratinised stratified squamous epithelium with arcading pattern and the underlying connective tissue stroma showed blood capillaries, areas of hemorrhage, lymphocytes and plasma cells which suggested radicular cyst thereby confirmed the provisional diagnosis.



Fig 6: Intra oral pre op photograph

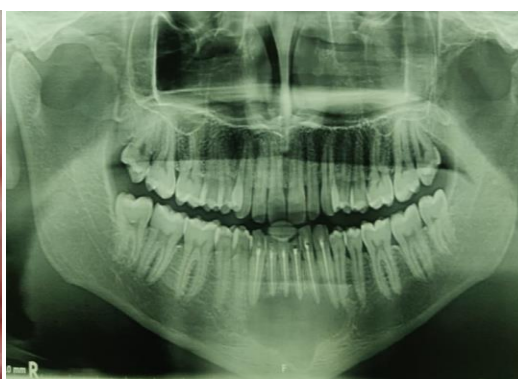


Fig 7: Pre op OPG



Fig 8: Buccal cortical erosion



Fig 9: Enucleation and Apicoectomy



Fig 10: Suturing



Fig 11: 6 months post op OPG

IV. Discussion

Cyst is a pathological sac like structure of varying size within a tissue that can occur anywhere in the body^[8]. Cysts of jaws are classified as odontogenic cysts, arising from tooth forming tissues and non odontogenic cysts, are developmental or fissural^[9]. The cysts lined by epithelium are known as true cysts while those not lined by epithelium are pseudocysts. True cysts are more common in the jaws bone because of the close proximity to the epithelial cell rests^[10]. The pathogenesis of cyst has three stages: cyst initiation, cyst formation and cyst enlargement or expansion^[1,2,4,7]. In the initiation stage, the epithelial cell rests start proliferating under the influence of bacterial antigens, epidermal growth factors, cell mediators, metabolites that are released by various cells residing in the lesion and decreased oxygen tension with increased co2 tension. The stage of cyst formation is explained by three theories: Nutritional deficiency theory, Abscess theory, Merging of epithelial strands theory. Nutritional deficiency theory states that with the proliferation of the epithelial cell rests the innermost cell of the mass do not get nutritional supply and undergoes necrosis resulting in a cavity formation. The abscess theory states that the proliferating epithelium lines an abscess cavity formed by tissue necrosis and lysis because of the innate nature of the epithelial cells to cover exposed connective tissue surfaces. Merging of epithelial strands theory states that the continuously growing epithelial strands merges to form a three-dimensional mass. When the connective tissue trapped inside this epithelial mass degenerates, it results in a cyst formation. Cysts enlargement occurs by peripheral epithelial cell division and accumulation of contents within the lumen of the cyst^[1,2,4,7,11,12].

Radicular cyst is the most common type of odontogenic cyst that occur in jaws. It is more commonly associated with patients in third decade of life^[13]. It is an inflammatory cyst that arises from cell rest of malassez following stimulation from necrotic pulp tissue which results from either trauma or dental caries. Infection spreads from pulp to periapical tissues through apical foramen which leads to apical periodontitis which if left untreated further leads to periapical granuloma/ periapical cyst. Radicular pulp and peri apical region serves as a most suitable site for the mixed anaerobic organisms to survive and replicate. Thus these microorganisms release chemical mediators and affects the periapical region and thereby leading to series of periapical pathologies. Radicular cyst is generally of 2 types: True radicular cyst and bay cyst. True radicular cyst is a one which contains a closed cavity lined by epithelium whereas in bay cyst, epithelium is attached to the apical foramen and lumen of the cyst remains open and maintains continuity with the infected root canal of the tooth.

Radicular cyst in general remains asymptomatic but as it enlarges causes cortical expansion and thinning of bony cortex leading to egg shell crackling and cortical erosion^[14]. In the initial stages swelling will be bony hard later swelling exhibits springiness because of thinning and finally on perforation of cortex, fluctuation can be felt. In the above cases, cortical perforation was noted in buccal cortices.

If a cyst develops in maxillary posterior region, usually on expansion it can cause upward displacement of sinus but with the cortical outline intact. Pekiner et al. have stated that even a very large radicular cyst arising in maxilla results in clinically very less noticeable jaw expansion. In case of such large lesions, CT scans are preferred over conventional panoramic radiography to visualise the extent of lesion to determine maxillary sinus invasion and nasal/ orbital invasion^[11].

Treatment for radicular cyst is still a matter of dispute and it varies from endodontic treatment, marsupialisation, enucleation and apicoectomy. Treatment selection depends on various factors such as size of lesion, proximity to anatomical structures, systemic condition of the patient^[1]. Many professionals opt for endodontic treatment for smaller cases. Takasi et al., stated that two weeks of calcium hydroxide intracanal dressing is required for bactericidal activity in periapical region. However surgical intervention is required in cases of larger cyst^[3]. Root canal treatment along with root end resection, periapical curettage/enucleation reduces the risk of recurrence because root canal treatment eliminates bacteria and reduces the microbial load in root canal and further by resecting the root end, lateral canals which are commonly found in the apical third which

fails to get obliterated gets resected thereby preventing the recurrence and also root end resection helps to remove any residual pathologic tissue on lingual / palatal aspect of the root^[15]. Here in our both the cases root canal treatment was initiated and calcium hydroxide dressing was given for two weeks and then obturation was performed followed by surgical enucleation, root end resection and retrograde filling with GIC.

In recent times, use of PRF in the enucleated cavity along with MTA as a retrograde filling agent and GTR techniques (i.e., use of bone graft along with collagen membrane) have shown excellent osseous healing.

V. Conclusion

In this article, we have reported two cases of giant radicular cyst, one in maxilla and other in mandible which were successfully treated by root canal treatment followed by surgical enucleation and apicoectomy. Eventhough there are studies which have reported successful management of radicular cyst by nonsurgical means, still it requires studies in large scale to prove the success rate of nonsurgical technique. Till then, surgical management is the viable option for larger cysts.

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