

# Surgical Management Of Radicular Cyst With Microscope – A Case Report

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**Abstract:** Radicular are most common odontogenic cyst with high predilection for maxillary teeth. Most of them are diagnosed during routine radiographic examination. Final diagnosis is confirmed by histologic evaluation only. Treatment plan can vary from surgical to non-surgical procedure depending on the extent of lesion, proximity to vital structure and patient medical history. The present case, a radicular cyst was successfully managed with root canal therapy along with surgical enucleation under operating microscope.

**Keywords:** Radicular cyst, enucleation, operating microscope

## I. INTRODUCTION

Periapical radiolucencies are commonly found associated with non-vital teeth.<sup>1</sup> Depending on size, sometimes, they are diagnosed as cyst but diagnosis is confirmed only after relating radiographic lesion size to histology. Among odontogenic cyst most common are radicular cyst with incidence of 52 to 68% of entire jaw cyst.<sup>2</sup> They arises from remnants of epithelial rest of malassez as a consequence of inflammation, usually following the necrosis of pulp. Most of them are asymptomatic and found only during routine radiographic investigation done for other purposes. They are found more frequently in maxillary than mandibular teeth and rarely in primary dentition.<sup>3</sup> Over the time cyst may remain static or increase in size. Treatment plan for cyst vary from surgical procedure to non-surgical management depending on size, localisation of cyst, bone integrity of cystic wall and proximity to vital structures. The present case report discuss the surgical management of radicular cyst using operating microscope.

## II. CASE REPORT

A female patient of age 20 years reported to department of conservative dentistry and endodontic with chief complaint of pain in left maxillary anterior front teeth for 4 months. Patient gave history of trauma with respect to upper front teeth 5 year back due to sudden fall while playing. Since there was no history of associated pain or bleeding at the time of trauma, so no treatment was undertaken for same. Thorough intraoral examination revealed a softness of bone in labial aspect with respect to 21, 22. Teeth (21, 22) were tender on percussion and showed no response to vitality test. Radiographic examination (occlusal and periapical view) revealed large radiolucency (2x4 cm) involving periapical region of 21, 22 (Figure 1, 2).

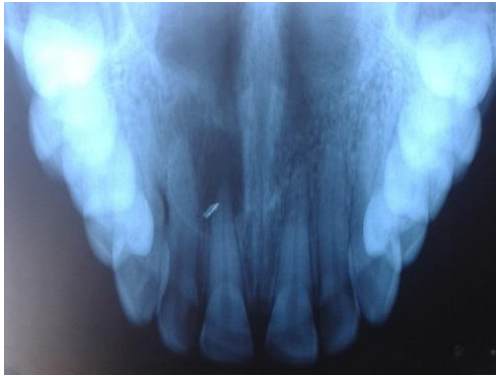


Figure 1: Occlusal radiograph showing periapical radiolucency with 21, 22

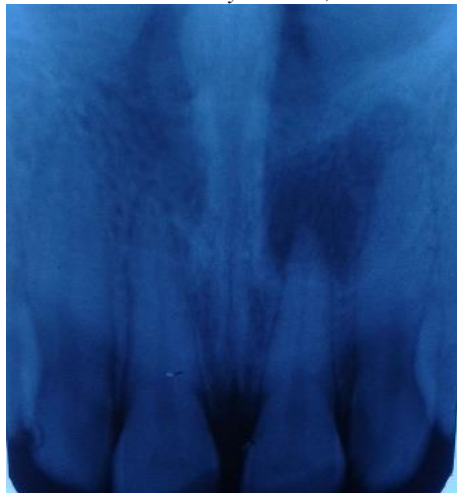


Figure 2: Periapical radiograph showing radiolucency with 21, 22

From history and clinical examination a provisional diagnosis of radicular cyst was made. Treatment was planned to enucleate lesion surgically after endodontic treatment of respective teeth (21, 22). Anti-inflammatory and antibiotics were given for management of the symptoms. The treatment plan was formulated, explained to patient and informed consent was taken. Access opening done under rubber dam with respect to 21, 22. After complete biomechanical preparation calcium hydroxide dressing was given for one week. In next visit root canal treatment was completed and post-operative radiograph taken (Figure 3).



Figure 3: Post-operative radiograph after root canal treatment with 21, 22



Figure 4: Full thickness flap reflected showing bone defect filled with cystic cavity

After administration of local anaesthesia 2% lignocaine with adrenaline, crevicular incision was made in labial region extending from 21, 22 with vertical releasing incision. After that full thickness flap was raised to expose cystic site which showed bony cavity with missing buccal plate with respect to 21 (Figure 4). A bony window is created with respect to 22 and cystic enucleation was carried out under microscope. Cyst was removed completely with epithelial lining in toto. The excised tissue was sent for histopathological investigation (Figure 5).



Figure 5: Excised tissue for histological examination



Figure 6: Enucleation of cyst

Bevels were placed on apices of maxillary left central incisor and lateral incisor, overextended gutta percha cut with hot instrument followed by condensation and apex were sealed with glass ionomer cement (Figure 6). Flap closure was done, post-operative instructions given to the patient and asked to come for follow up after one week for suture removal. Patient was asymptomatic and post-surgical healing took place without any complication. Later, histological report also confirmed diagnosis.

### III. DISCUSSION

A radicular cyst is classified as inflammatory cyst which is preceded by periapical granuloma formation and stimulation of cell rest of malassez. Mostly source of epithelium is malassez, it can also arise from sinus lining, crevicular epithelium and epithelial lining of fistulous tract. Pathogenesis of radicular cyst include three different phases: initiation phase, phase of formation and enlargement phase. Initially radicular cyst are usually asymptomatic, remain unnoticed and detected only during routine radiographic examination. With time they enlarge in size, bone covering becomes thin, preceding to complete erosion of bone with formation of cystic cavity as in present case. Treatment plan can vary from conventional non-surgical RCT to surgical treatment like enucleation, marsupialization depending on extent of lesion, relation with noble structures, cooperation and systemic condition of patient. In present case we surgically enucleated cyst after root canal treatment of 21,22 under microscope. With use of operating microscope some factors that control outcome of treatment can be improved. In first phase of osteotomy, microscope improves visualisation of apical and periapical zones, enhanced detection of anatomic variation and visualization of lesion. Second phase that include apicoectomy is crucial to determine success of treatment as it is imperative to remove pathological tissue from apical region due to presence of apical delta. In last phase (apex preparation and retrograde filling) of endodontic surgery with use of microscope, visual acuity is enhanced which enables better detection of any residual pathological tissue, debris that otherwise may remain in bony cavity leading to failure of endodontic surgery. Post-operative symptoms were minor due to minimized trauma to both hard and soft tissue. Although microscope provide such advantage but its high cost, time needed to adapt to instrument and increased surgical time limit its use in routine practice.<sup>11</sup> Microscope improves visualisation of field but the usable power is restricted as increasing magnification will result in decrease the depth of field and narrow its size<sup>12</sup>. Studies also suggested that magnification above 30X is of little importance in periapical surgery because slightest movement of patient including breathing throws the field out of focus and repeated refocusing causes unnecessary eye fatigue. To use microscope surgeon also need to adapt to different handling of instrument to avoid problem such as altered perception and evaluation of dimensions of the structure. The assisting staff should also be

properly trained in chair side assistance.<sup>9</sup>As it is well known fact that using an operating microscope is a cumbersome process but with practice over the time, one can master and overcome its limitations.

### IV. CONCLUSION

Currently periapical cyst can be managed by various treatment modalities. It is found that small lesions can be managed better by non- surgically conventional root canal therapy while surgical approach along with root canal therapy is more beneficial in treatment of large cystic lesions. In the present case, the surgical approach using microscope represents the successful management of radicular cyst. Although further studies are necessary to determine the beneficial effect of microscope.

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