

# INFECTED RADICULAR CYST INVOLVING FOUR LOWER INCISORS: SHORT REVIEW AND CASE REPORT

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## ABSTRACT

*Radicular cyst of both jaws is an odontogenic in origin. It is usually a chronic inflammatory changes to the epithelial rest of malasses in the periodontium of the affected teeth. Chronic irritations of such lesions involve chronic trauma, microbial infections and chemical injury. A 47 years old female patient came to the periodontal clinic complaining of an intra and extra oral swelling affecting anterior lower jaw with a chin fistula. Clinical presentation and radiographic investigation were suggestive of radicular odontogenic cyst involving lower central incisors. This case was managed by surgical enucleation, root canal treatment and followed up for two years.*

**Key Words:** Odontogenic Radicular Cyst, Root canal treatment, Bone graft and collagen membrane.

## INTRODUCTION

A cyst can be defined as a pathological cavity usually inside bone lined interiorly by epithelium and exteriorly by connective tissue filled with fluid or semifluid.<sup>1</sup> Cysts can be classified as developmental or odontogenic. Radicular cysts of both jaws are an odontogenic in origin.<sup>1</sup> It is usually a chronic inflammatory change to the epithelial rest of malasses in the periodontium of the affected teeth.<sup>2</sup> Chronic irritations of such lesions involve chronic trauma, microbial infections and chemical injury. Such injuries irritate the pulps of involved teeth leading to necrosis and subsequently chronic apical periodontitis which provoke the dormant cells to proliferate and initiate cystic degeneration.<sup>3</sup> Among cysts affecting the jaws, about 65-70% are radicular cysts at the apex of the involved teeth.<sup>4,5</sup> The treatment choice for radicular cysts depends on aetiology, location and size of the lesion. Small size cysts can be treated conservatively via root canal treatment while large size can be treated surgically by enucleation and apicectomy using orthograde and retrograde obturation technique.<sup>6,7</sup> When the involved tooth or teeth is/are hopeless or non-strategic, enucleation of the cyst followed by extraction of involved tooth or teeth is recommended.<sup>8</sup> The cystic wall must be totally enucleated

surgically to remove all epithelial remnants in order to prevent recurrence of the lesion. This case report presents a successful surgical management of large infected radicular cyst that involved 4 lower incisor teeth.

## CASE REPORT

A 47 years old female patient came to the periodontal clinic at the department of dentistry, Prince Hashim Hospital (PHH), Zarka, Jordan complaining of an intra and extra oral swelling affecting anterior lower jaw with a chin fistula since 3 months. Clinical symptoms were pain on mastication, swelling and mobility of lower incisors, while signs were including sinus tract extraorally, discoloration and grade 1 mobility and deep pocketing of four lower incisors, presentation and radiographic investigation were suggestive of infected radicular odontogenic cyst involving four lower central and lateral incisors (Fig 1). Orthopantomogram revealed generalized horizontal bone resorption surrounding the necks of anterior teeth of four lower incisors indicating generalized periodontitis case. Radiolucency was single, large and well defined of size 2 cm × 2 cm extending supero-inferiorly from periapical region of four lower incisors to 2.5 cm above lower border of mandible. All four lower incisors were nonvital on examination and on vitality tests.

Treatment of radicular cyst involves a complete surgical excision (enucleation) of the cyst and root canal treatment of all nonvital teeth. In this case it was decided to merge both surgical and nonsurgical

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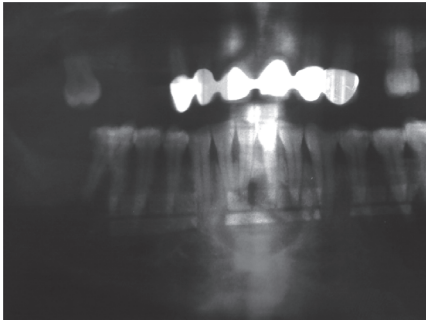


Fig 1: Orthopantomogram revealed generalized horizontal bone resorption

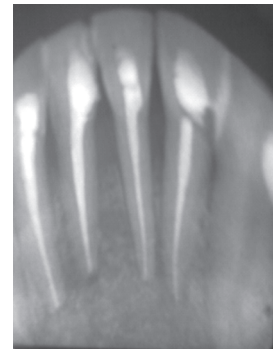


Fig 6: GP obturation

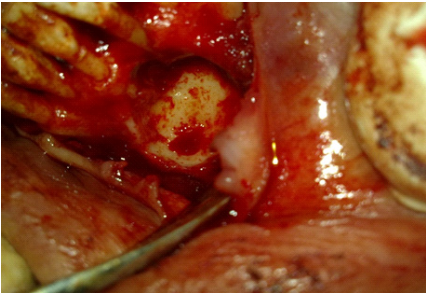


Fig 2: Envelop flap



Fig 7: Vicryl 4/0 suture



Fig 3: Sinus tract was excised and intimately sutured



Fig 8



Fig 4: Bone graft granules



Fig 9: Healing of sinus tract



Fig 5: Collagen membrane



Fig 10: Healing of gingiva

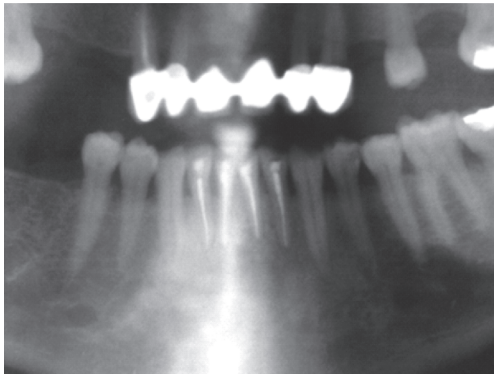


Fig 11: 2-year follow up

endodontic treatment i.e apicectomy using orthograde and retrograde obturation. Under local anesthesia access was gained for four lower central and lateral incisors, reaming and filling with frequent 5% sodium hypochlorite irrigation was applied. Envelop flap was opened under local anesthesia (Fig 2). radicular cyst was enucleated and the sinus tract was excised and intimately sutured (Fig 3). All necrotic bone was curetted via bone curette until the bone become clean, hard and healthy. Apices of incisor teeth were resected (Fig 6) gutta-percha was filled with a lateral technique and three dimensional hermetic seal was achieved. All debris were irrigated with normal saline until the surgical field become clean. Synthetic bone graft was applied to fill the defect and collagen membrane was placed to cover the graft (Fig 4 and 5). Flap was sutured with a resorbable Vicryl 4/0 suture (Fig 7). Orthodontic wire and composite fixation from canine to canine was applied to distribute occlusal load and support the already mobile dentition.

#### **Histopathological examination and laboratory work**

Surgical excision was necessary for two reasons: one to send the excised lesion for histopathological examination to rule out any malignancy. Two to treat the lesion radically. The steps of the surgical operation were explained to the patient. Patient was recalled for a post-operative checkup after 3 days, one week, 2 weeks (Fig 8 and 9), 2 months (Fig 10) and 2 years (Fig 11). No complaints were reported by the patient. The healing was complete with minimal scar at the chin which was not so apparent (Fig 9). Patient was kept on a follow up for two years. The histopathological report confirmed the lesion to be radicular cyst.

#### **DISCUSSION**

In the present case the size of radicular cyst was large, unilocular, well demarcated by radioopaque line and hence was not confusing for final diagnosis. Cysts can be classified as developmental or odontogenic. Radicular cysts of both jaws are odontogenic in origin 1.

In this case it was clear that the apparent causes were endodontically involved anterior teeth and chronic periodontitis were evident for the formation of the radicular cyst. The infection might have started with mandibular anterior teeth. The cyst was infected and drain through the extraoral sinus tract resulting in apical periodontitis which also had a negative effect on marginal periodontitis potentiating it.<sup>8,9</sup> Bone resorption around the apices of four lower incisors results in deprivation of these teeth from blood supply resulting in pulpal necrosis and inflammation.<sup>11</sup>

Root canal treatment of such teeth alone without surgery will never result in complete healing since the cyst was very large and infected with mixed bacterial media. It is well-established that root canal infection is the cause of primary and post-treatment apical periodontitis.<sup>10-14</sup>

Besides inflammatory apical true cysts has been suggested as a possible cause that prevents healing of apical periodontal lesions. Because these agents exist outside the root canal system, endodontic retreatment is unlikely to resolve the factors that sustain the periapical lesion. Therefore, apical surgery is indicated for successful treatment of such cases.<sup>14</sup> It is also widely believed in the endodontic microbiology and described in several endodontic textbooks that large cyst-like periapical lesions and apical true cysts are most likely not able to heal without surgical root canal therapy alone.<sup>15-17</sup>

Apical periodontitis due to periapical infected cyst or chronic abscess can be treated by conventional root canal therapy when the lesion is small. Both surgical and nonsurgical combination endodontic treatment is indicated in large periapical lesions.<sup>18,19</sup> In this case the suitable solution was enucleation of the cyst and root canal therapy at the same time which was good option for the patient with poor compliance.<sup>15-17</sup>

#### **CONCLUSION**

Etiology of large radicular cysts involve mainly endodontic infections. Clinical and radiographic investigation are necessary to establish appropriate diagnosis which enable the clinician to achieve suitable and more conservative treatment option to save the integrity of both soft and hard tissues i.e. teeth and bone.

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#### CONTRIBUTION BY AUTHORS

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| <b>1 Yahya MA Draid:</b>           | Main author and coordinate the whole case. |
| <b>2 Nabil A Al-Shdaifat:</b>      | Histopathological exa                      |
| <b>3 Mashhoor Abdo Al-Wraikat:</b> | Editing and did RCT trt.                   |
| <b>Hazem M Khraisat:</b>           | Participate in writing up                  |
| <b>Zuhair Mheedat:</b>             | Participate in bone graft and surgical trt |