



## Residual Radicular Cyst Surgically Treated: A Case Report

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### Keywords:

### Article Info.:

#### Article History:

Received: 17/1/2024

Received in revised form:  
25/3/2024

Accepted: 1/4/2024

Final Proofreading: 1/4/2024

Available Online: 1/6/2025

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**Citation:** Hawi MT, Malik SA.  
Residual Radicular Cyst Surgically  
Treated: A Case Report. Tikrit  
Journal for Dental Sciences. 2025;  
13(1): 182-188.

<https://doi.org/10.25130/tjds.13.1.19>

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### Introduction:

The cyst is described as a pathological cavity lined fully or in parts by epithelium with fluid, semi-fluid, or gaseous contents that is not caused by pus accumulation (1, 2). Odontogenic cyst generally classified into inflammatory (*radicular cyst also called periapical or dental cyst, Residual cyst, Paradental cyst*) and developmental (Eruption cyst, Gingival cyst, Glandular odontogenic cyst, Odontogenic keratocyst, Lateral periodontal cyst, Dentigerous cyst, Orthokeratinizing odontogenic cyst) (3, 4). The lining epithelium of odontogenic cyst originate from residues of tooth forming tissues which includes (epithelial cell rest of serres, reduced enamel epithelium(REE), epithelial cell rest of malassez) (4). The ERM at the root apex of the affected tooth proliferates due to the inflammation which increase the osmotic pressure leading to the cyst's enlargement(3). Periapical cysts are the most prevalent cystic lesions of odontogenic cyst nearly 52% - 68% (5) however rarely seen on clinical diagnosis it often discovered by radiographs as clearly defined round or oval unilocular radiolucency with a radiopaque sclerotic border in the periapical region of the affected tooth(6, 7). Histologically appear one to two thin cell layers of nonkeratinized stratified squamous epithelium related to inflammatory infiltrates and inflamed fibrous connective tissue.(8). Treatment of periapical cyst ranged from conventional endodontic therapy to surgical treatment like apicoectomy, marsupialization, enucleation depending on the size and extension of the lesion and its relation to anatomical structures and the systemic condition of the patient, generally has good prognosis (9, 10). Radicular cysts classified into apical, lateral and residual based on the anatomical relationship to the root of the tooth, apical radicular cysts make up the largest percentage 75% and related to the apex of non-vital tooth while The lateral type is unusual and develops after the spread of the inflammation from the pulp via the lateral root canals into the lateral periodontium, in complete curettage of radicular cyst after extraction of the involved tooth may not trigger complications mostly result in residual cyst formation accounting for 20% (11)

**Case presentation:**

A 53-years-old male came to the AL-Baladyat governmental specialized dental center with a chief complaint to make a removable dental prosthesis to restore the missing teeth. During diagnosis and on routine orthopantomogram (OPG) discovered a large unilocular radiolucent lesion oval in shape on the left side of the mandibular premolar area (10x10 mm). The dental history revealed that the patient suffered from recurrent swelling at the same region associated with the retained root of tooth no 20 during the seven years ago and the patient also undergo extraction in the same region two weeks ago (tooth no 20). The patient is medically fit, the extra-oral examination showed normal face color and facial symmetry, no enlargement or fixation or tenderness in the lymph nodes. The intraoral examination shows no ulceration no swellings in the buccal and labial mucosa, and the lesion was not pulsating, not swelled, and not fluid-filled (approved by fine needle aspiration). Upon reviewing the information gathered from the dental history, radiographical findings, and clinical evaluation, a radicular cyst was the provisional diagnosis.

**Investigation:**

In order to establish a proper surgical approach the patient was sent for a CBCT radiograph for precise diagnosis and to check the proximity or involvement of the lesion with mental nerve. The CBCT shows a large lesion (14.3x13.7x13 mm) in direct association with the mental nerve (figure 1)

**Treatment:**

The treatment plan was formulated and explained to the patient in details which is surgical enucleation of the cyst under local anesthesia and his informed consent was obtained. The area of interest is anesthetized by inferior alveolar nerve block (IANB) and long buccal nerve block (LBNB). A three-sided full-thickness mucoperiosteal flap extended from the incisor to the molar region reflected (by surgical blade no 15 used) (figure2 A). It should be mentioned that when the flap reflected a yellowish to white fluid oozed

from the lesion and the bone was soft and irregularly resorped over the lesion. Surgical length round shape 25mm carbide bur low speed straight hand piece used to remove the bone to expose the lesion with continuous irrigation with normal saline (figure2 B). After exposing the lesion a surgical curette was used to complete curettage of the lesion alongside with granulation tissue removal (figure2 C). The lesion was in direct relation to the mental nerve, precise dissection by using blade No 15 was carried out to separate the lesion from the mental nerve. The specimen preserved in formalin (37%) to be sent for histopathological examination. Copious irrigation with normal saline was used to reveal sound boundaries of the bone (figure2 D). Synthetic Graft Particulate from Bionnovation Biomedical Hydroxyapatite used to make bone augmentation covered by collagen membrane. The surgical site sutured with 3.0 silk braided natural suture material to close the wound and restore the normal contour of the mucosa (figure2 E) the patient received the required instructions and medications

- i. Amoxicillin and potassium clavulanate (augmentin) tablets 625mg
- ii. Dexamethasone injections
- iii. Volt fast oral solution 50mg

**Histopathology:**

Sections showed a cystic cavity lined by a non-keratinized hyperplastic stratified squamous epithelium overlying an inflamed connective tissue wall (figure3) The histopathological picture is c/w radicular cyst

The histopathological study confirmed the provisional diagnosis

**Follow up:**

During the first follow-up visit which was 7 days postoperatively the sutures was removed there were good signs of healing, no signs of inflammation at the operation site (figure4 A), the patient complaint of numbness in the lip at the affected side during four days after the operation which was normal due to the surgical dissection in approximate to the mental nerve after that the numbness decreased gradually

until completely resolved in three weeks postoperatively

At the second follow-up visit after a month an OPG radiographic picture exhibited a good healing of the lesion (figure4 B)

The third follow-up visit after three months the OPG radiograph showed more healing and a good amount of bone formation (figure4 C)

On the fourth follow-up visit after eight months the OPG showed complete healing in the operation site (figure4 D,E)

### **Discussion:**

Periapical cysts are lined wholly or in part by non-keratinized stratified squamous epithelium and divided into those with cavities entirely lined by epithelium (true cysts) make up higher than 50% and those with cavities lined with epithelium but continuous with the root canals (strap or pocket cyst) (11). It was crucial to identify the type of cyst since the true cyst is sustainable and can resist endodontic therapy while the pocket cyst has a continuous lumen with the root canal and relies on the pulpal infection for development and persistence therefore after receiving standard endodontic care pocket cysts disappear and recover while true cysts need to be surgically treated (11-13). The majority of clinicians choose traditional endodontic therapy for localized lesions (smaller than 1cm) in diameter however enucleation or marsupialization are surgical options for lesions larger than 1cm(9, 10). The success rate of endodontic procedures is quite impressive however endodontic therapy may fail because the microbes persistent in the apical portion of root canal even in well treated teeth which allows for the possibility of infection persistence, Studies have revealed that some root canal regions cannot be shaped or cleaned, obturated by using the current tools, materials and methods(14). To treat lesions that are unresponsive to endodontic treatment, apicoectomy may also be combined with a

root canal filling as an alternative, allowing for direct curettage of the cystic lesion.(15). Marsupialization is indicated for very large lesions and is proximal to vital structures if treated by enucleation there is a risk of jaw fracture complications and unnecessary tissue sacrifice, also if the patient medically ill-fitted and debilitated because it is simple and maybe less stressful (13, 16). The main disadvantages of the marsupialization procedure include pathologic tissue being left and the absence of an extensive histologic investigation and the need for several visits for follow-up and routine cavity cleaning(17). The main advantage of enucleation is allowing for pathologic examination of the cystic tissue also the excisional biopsy treat the lesion(13). Endoscopic enucleation is a modern technique offers clear visualization of the whole cystic cavity, making it possible to remove any diseased tissue and maintain the integrity of the important anatomical structures (18). The current case is large residual true cyst so surgical enucleation was performed in spite of using surgical enucleation the vitality of anatomical structures (mental nerve) preserved and histopathological study was done on the cystic lesion to confirm the provisional diagnosis.

### **Conclusion:**

This case report highlights two important things first one remind the general public of the need for early diagnosis of dento-alveolar diseases. Early detection can reduce the need for invasive surgical procedures and stop further complications from developing. The second one, since we discover this lesion on routine radiographic examination, this paper demonstrates the value of radiographic evaluation before tooth removal because it provides information about the roots and the surrounding tissues.

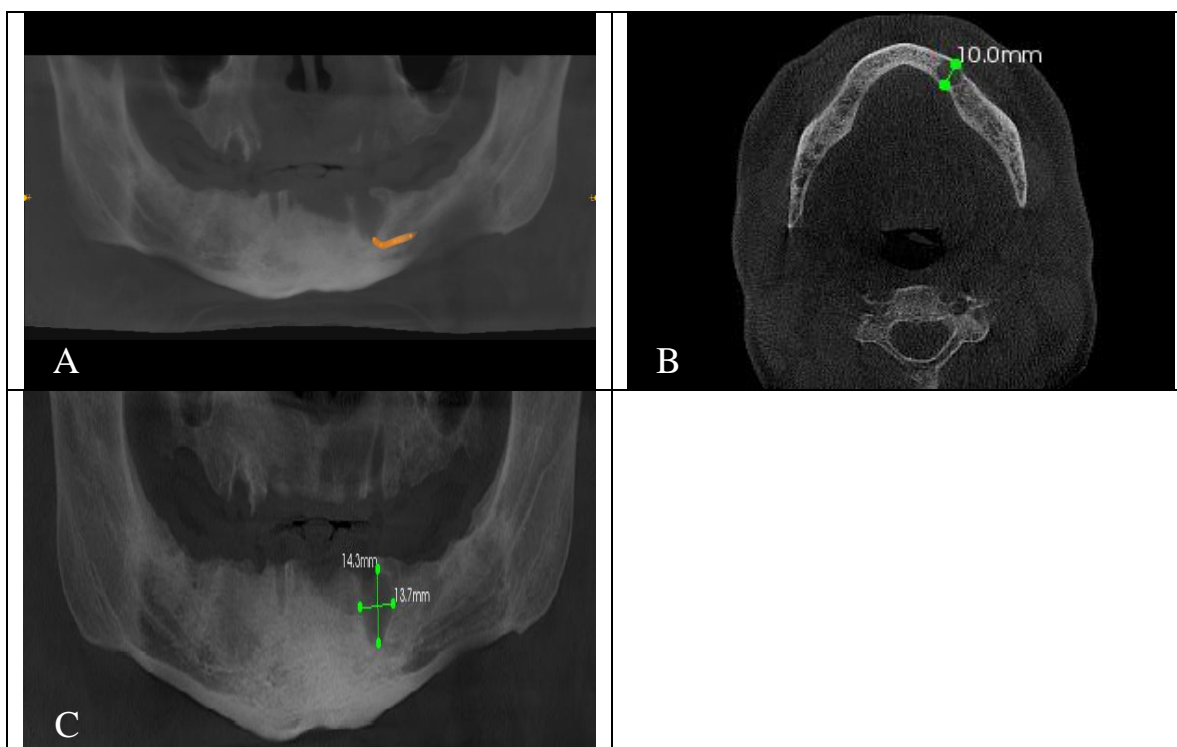


Figure 1: CBCT radiograph: (A) CBCT show the direct association between the mental nerve and the lesion. (B and C) CBCT show the size of the lesion

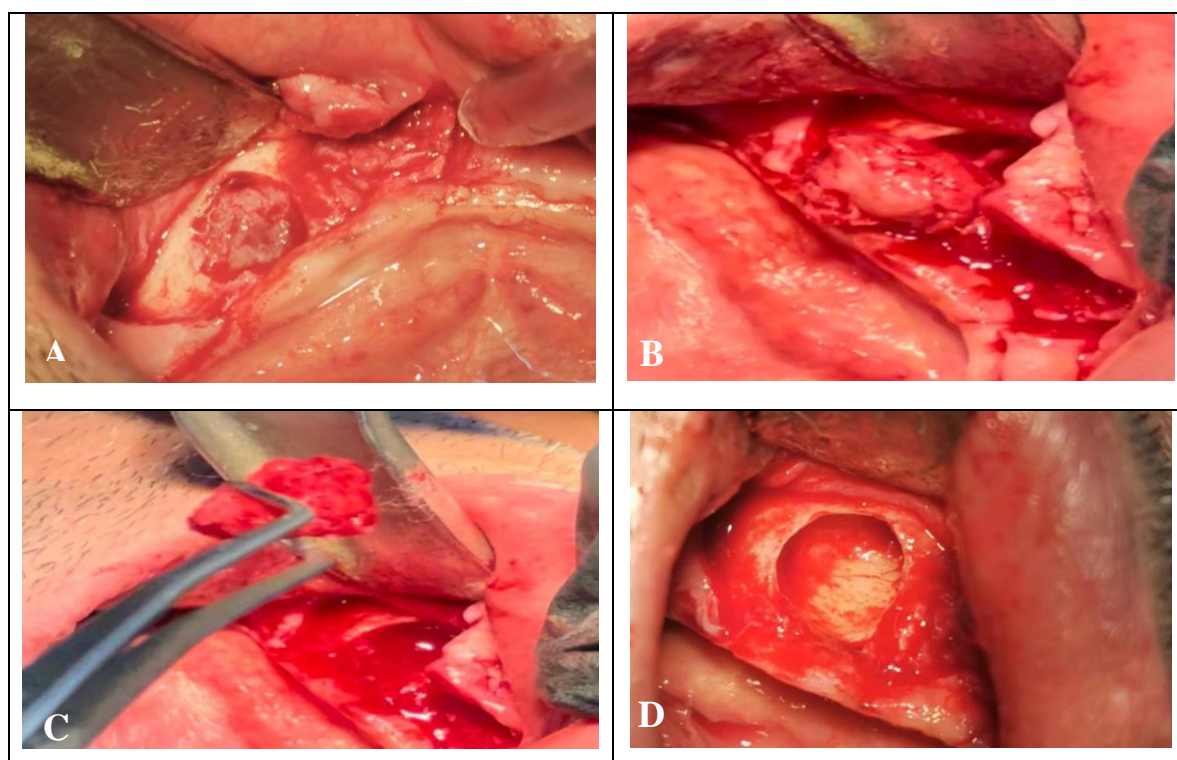






Figure 2: Surgical enucleation treatment: (A) Three sided full thickness mucoperiosteal flap done by blade no 15 elevated by mucoperiosteal elevator. (B) Removing the bone by low speed hand piece using large round carbide bur to expose the lesion. (C) Surgical curette was used to complete curettage of the lesion alongside with granulation tissue removal. (D) Copious irrigation with normal saline used to reveal sound boundaries of the bone.(E) Closure of the wound by simple interrupted suture

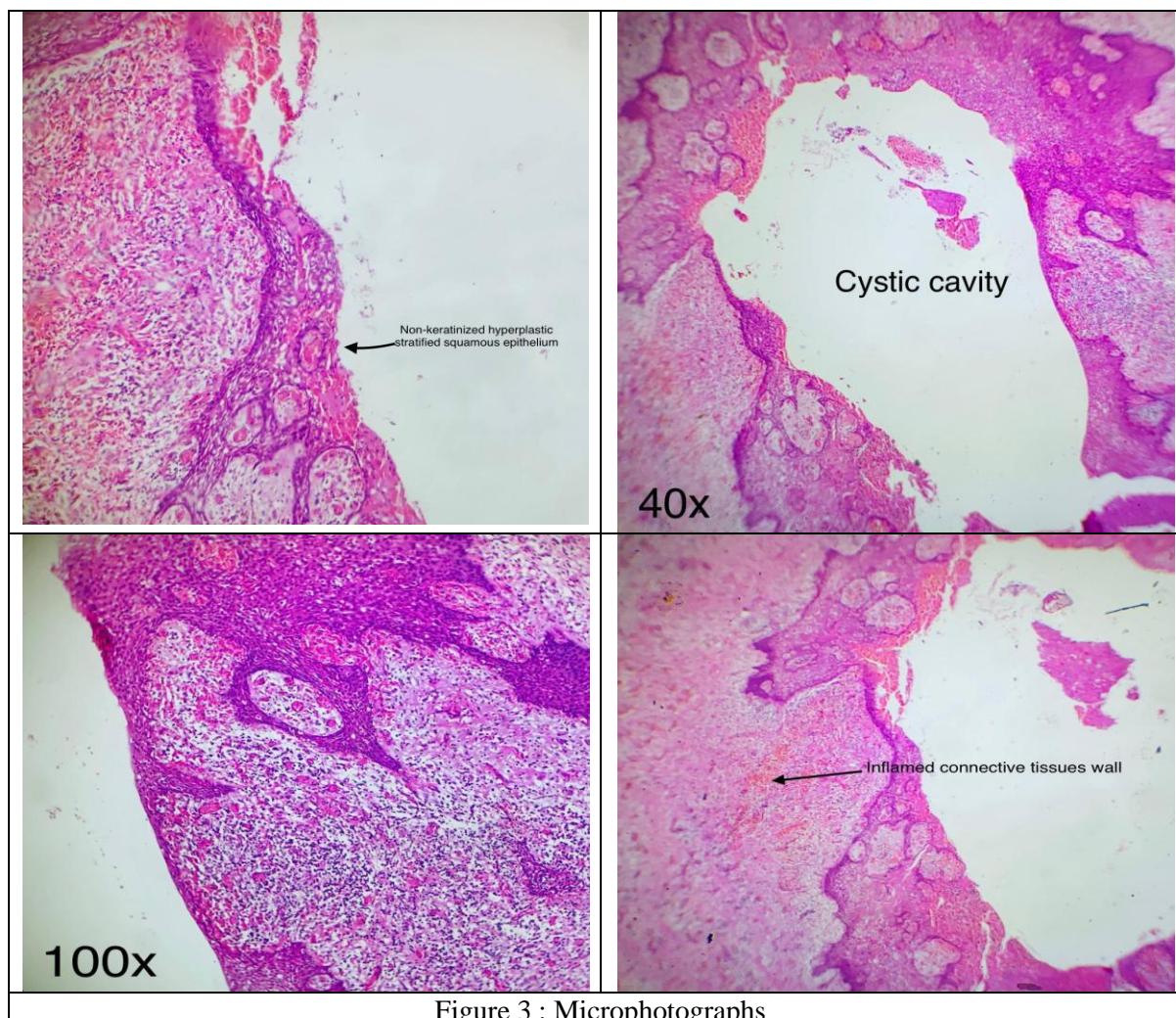


Figure 3 : Microphotographs

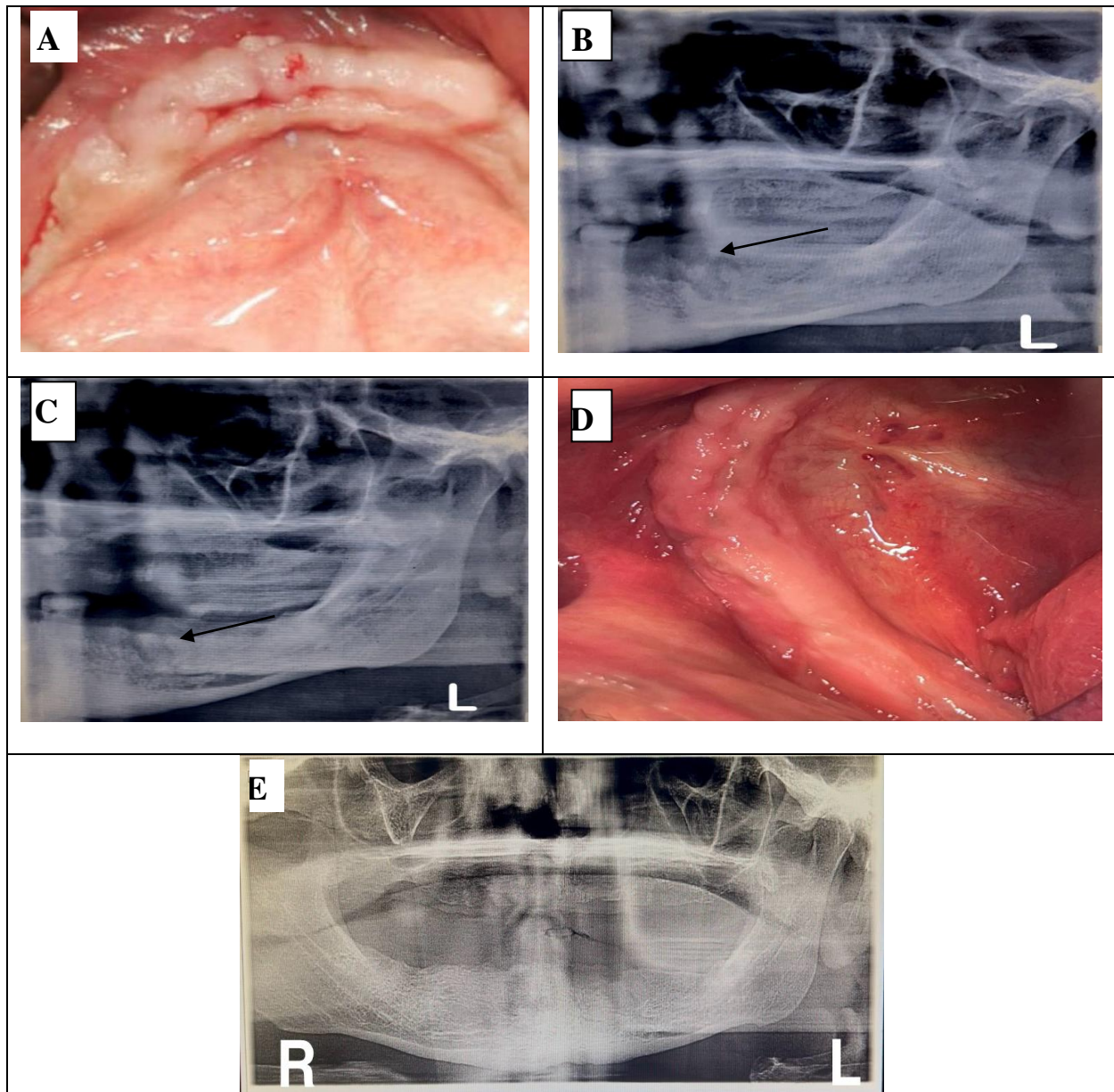


Figure 4: follow up visits: (A) the first follow-up visit and removing the stitches. (B) OPG radiographic picture after one month show a good healing of the lesion (the arrow define the site). (C) OPG radiographic picture after three month show more healing and good amount of bone formation (the arrow define the site). (D and E) the radiographic picture and the clinical picture show complete healing of the operation site after eight

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