

## The dilemma of management of cystic lesions; an uncertain way forward: A case report

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### Abstract

Periapical diseases ranges from mild granulomatous lesions to large cystic ones, with the treatments corresponding to their respective pre-operative diagnoses. However, the determination of cause of periapical radiolucency is impossible on pre-operative clinical and radiographic examinations. We present a case highlighting the difficulties encountered in treating a periapical cyst using the current evidence in literature. It demonstrates the uncertainty involved in treating such lesions, owing to the impossible nature of determining the histopathological nature of the cyst, i.e., being either true cysts or pocket cysts. This case includes orthograde re-treatment; decompression of the cystic lesion, followed by peri-apical surgery of two teeth over a course of three years; and the uncertain outcomes encountered after each phase of the treatment.

**Keywords:** Granuloma, periradicular lesion, apical cyst, periapical surgery, non-surgical retreatment.

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### Introduction

Endodontic infections cause an immune reaction in periradicular tissues, which may be evident as radiolucencies on radiographs.<sup>1</sup> The prevalence of cysts in particular, ranges between 15% to 32% of all periapical lesions.<sup>1</sup> These have historically been divided into two types, based on continuum of the infected root canal or a lack thereof, with the cystic epithelial lining.<sup>1,2</sup>

'Pocket cysts' are in continuity with the infected root canal, making these cysts manageable by endodontic intervention.<sup>1,2</sup> Contrarily, 'true cysts' are so called due to their ability to persist independently of the initiating endodontic infection.<sup>1,2</sup> These are self-sustaining lesions, with no openings to the root canal and require surgical

intervention disrupting the epithelial lining to ensure healing.<sup>1,2</sup>

Since both cysts are fundamentally indistinguishable on radiographs pre-operatively, their treatment presents a dilemma for clinicians. In the following narrative we present a case of large 'radicular cyst' that had challenged the current evidence due to the oversimplified nature of classification of cysts and the prescribed treatment options.

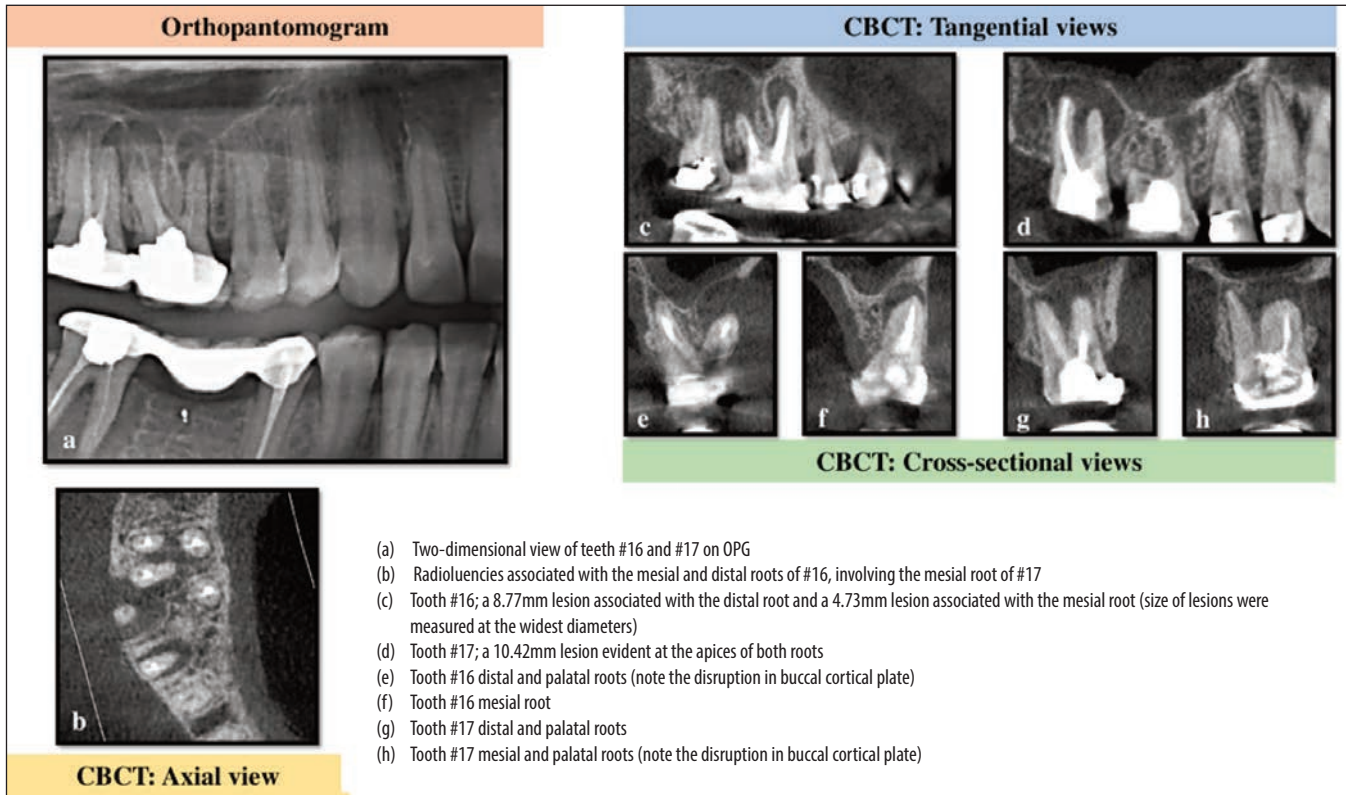
### Case

A 29-year-old healthy female presented to the dental clinics of Aga Khan University Hospital (Karachi, Pakistan) on 20th June 2019 with complaint of pain in upper right teeth since past two months. Upon clinical examination, teeth #16 and #17 had a splinted prosthesis and were tender to percussion and palpation, with a fluctuant abscess on the buccal aspect. On Orthopantomogram (OPG), it was evident that teeth #16 and #17 were endodontically treated, with inadequate obturation, associated with large periapical radiolucencies. A Cone Beam Computed Tomography (CBCT) with 8x8cm field of view (Orthophos XG 3D, Dentsply Sirona) scan revealed that the periapical lesions had well-defined margins (figure 1a) associated with mesial and distal roots of #16 and #17 (figure 1b, e & h). Therefore, a diagnosis of post-endodontic disease with chronic apical abscess for teeth #16 and #17 was established. The treatment options were discussed with the patient, and non-surgical orthograde re-treatment was planned for both teeth.

On a subsequent visit, non-surgical endodontic re-treatment was initiated in both teeth under local anaesthesia (2% xylocaine with 1:100,000 epinephrine, Dentsply Pharmaceutical, York, PA) and rubber dam isolation. The existing coronal restorations were removed. Consequently, the gutta-percha points were removed using ProTaperNext (Dentsply Maillefer, Ballaigues, Switzerland) rotary files, using an endo motor (Endo-Mate DT; NSK) using recommended speed and torque settings. The working lengths were confirmed radiographically and canals were prepared to X3 (30/0.07) using ProTaper Next in mesial and distal roots of both teeth. The palatal roots were prepared to a final apical size of 35 (35/0.04) using Bio RaCe (FKG Dentaire, Switzerland) rotary files. The canals

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**Figure-1:** Radiographic analysis.

were irrigated with 3% sodium hypochlorite (Antiseptic Liquid #2, Technodent, Beograd, Russia). The working lengths for the mesiobuccal, distobuccal and palatal roots of tooth #16 were: 19mm, 20mm, and 22mm, respectively. For tooth #17 they were: 18mm, 19mm and 21mm, respectively. Thereafter calcium hydroxide (OpaCal, Dentaires, Switzerland) was placed in the canals and accesses were temporized. One week later, the canals were irrigated with 3% sodium hypochlorite, 17% Ethylene diamine tetraacetic acid (EDTA, Roth International, Chicago, IL), normal saline and 0.12% chlorhexidine gluconate, respectively. Thereafter, canals were dried with paper points and obturated via cold hydraulic obturation technique with corresponding gutta-percha points (Dentsply Maillefer, Ballaigues, Switzerland) and calcium hydroxide-based sealer (Sealapex, Sybron Kerr, WA) followed by composite restorations. The teeth were prepared for full coverage crowns and provisionalized.

However, a few months later, the patient presented with an abscess associated with teeth #16 and #17 and decompression surgery was planned. Local anaesthesia (2% xylocaine with 1:100,000 epinephrine) was administered and a vertical incision was made through the abscess gaining access to the fenestration in the buccal cortical plate. A 10-mm syringe with 23-gauge needle was

used for aspiration of the exudate. The lesion was curetted and irrigated with normal saline. A 25 mm sterile 16-gauge nasogastric tube (Argyle, Covidien, Thailand) was cut and placed inside the opening which was sutured to the mucosa with 4-0 Vicryl sutures (Ethicon, Johnson & Johnson Int., USA). The patient was advised to irrigate the area using a 0.12% chlorhexidine. However, the tube dislodged within a few days and the patient was lost to follow-up.

Two years later, the patient presented with an abscess between teeth #16 and 17, with both teeth tender to percussion. On CBCT, periapical lesions involving the mesial roots of teeth #16 and 17 as well as the distal root of tooth #16 were evident (figure 2). Therefore, peri-radicular surgery of teeth #16 and 17 was planned. Ibuprofen (800mg) was prescribed to be taken pre-operatively.

After written consent, infiltration anaesthesia was administered (2% xylocaine with 1:50,000 epinephrine). The procedure was performed under a dental operating microscope (AM-4000, ALLTION, Guangxi, China). A full thickness mucoperiosteal flap was raised and an osteotomy was made using 2.0 Lindemann bur (Straumann Manufacturing, Inc. Andover, USA) in a highspeed handpiece under copious irrigation. The lesion was curetted and multiple cystic fragments (1.2x0.6cm) were

sent for histopathological analysis in 10% buffered formalin. Thereafter, 3mm of the apex of mesial and distal roots of tooth #16 and mesial root of tooth #17 were resected. Root-ends were prepared to a depth of 3mm using diamond-coated KIS tip #1 (Kavo Kerr Dental, France) powered by piezoelectric device MTS (Obtura Spartan Inc.), under water irrigation. Subsequently, 20% ferric sulphate (Ultradent Products, UT, USA) was applied for haemostasis. After drying the prepared cavities, Mineral Trioxide

Aggregate (MTA) Flow (Ultradent Products USA) was mixed according to manufacturer's instructions and condensed with micro-condenser to achieve optimum fill. The retrograde filling was verified on periapical radiographs (figure 2). The flap was approximated with interrupted sutures using 4-0 vicryl. Histopathological report confirmed the lesion being a radicular cyst (figure 3).

A periapical radiograph one year post-operatively

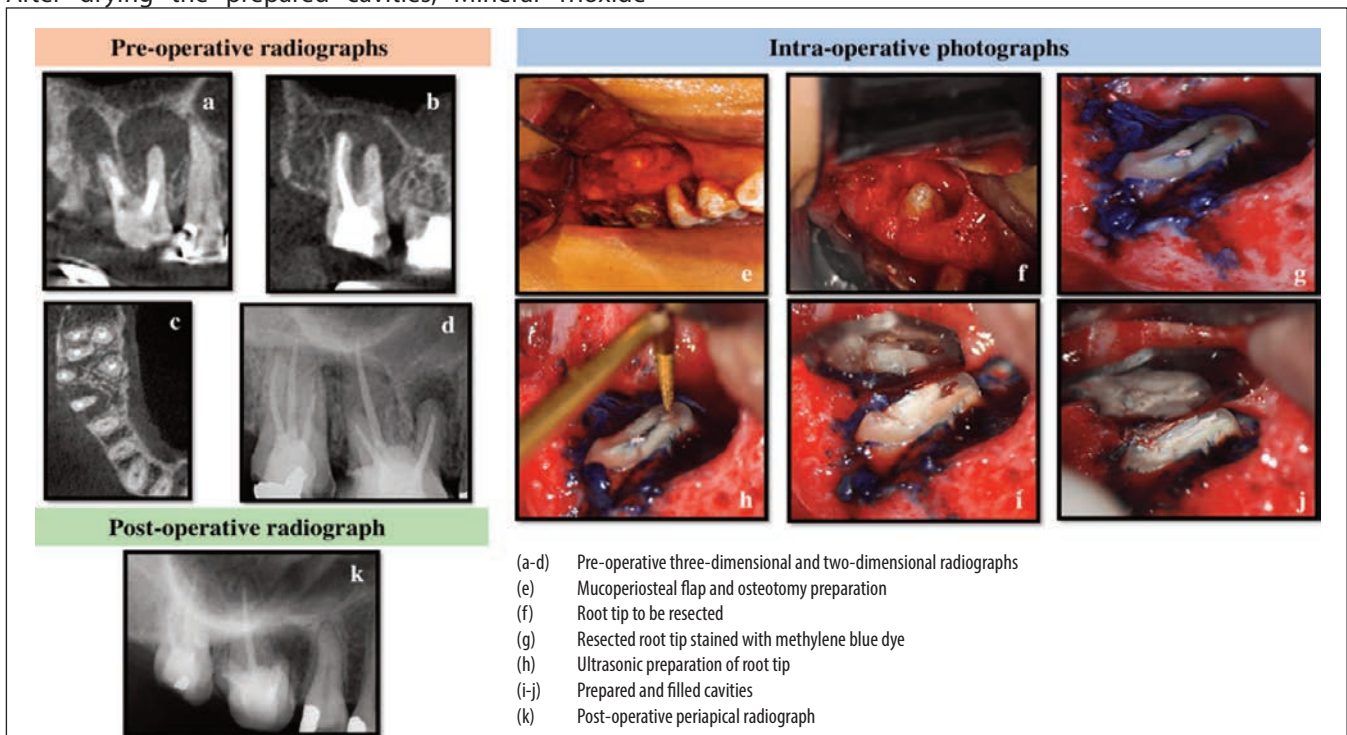


Figure-2:

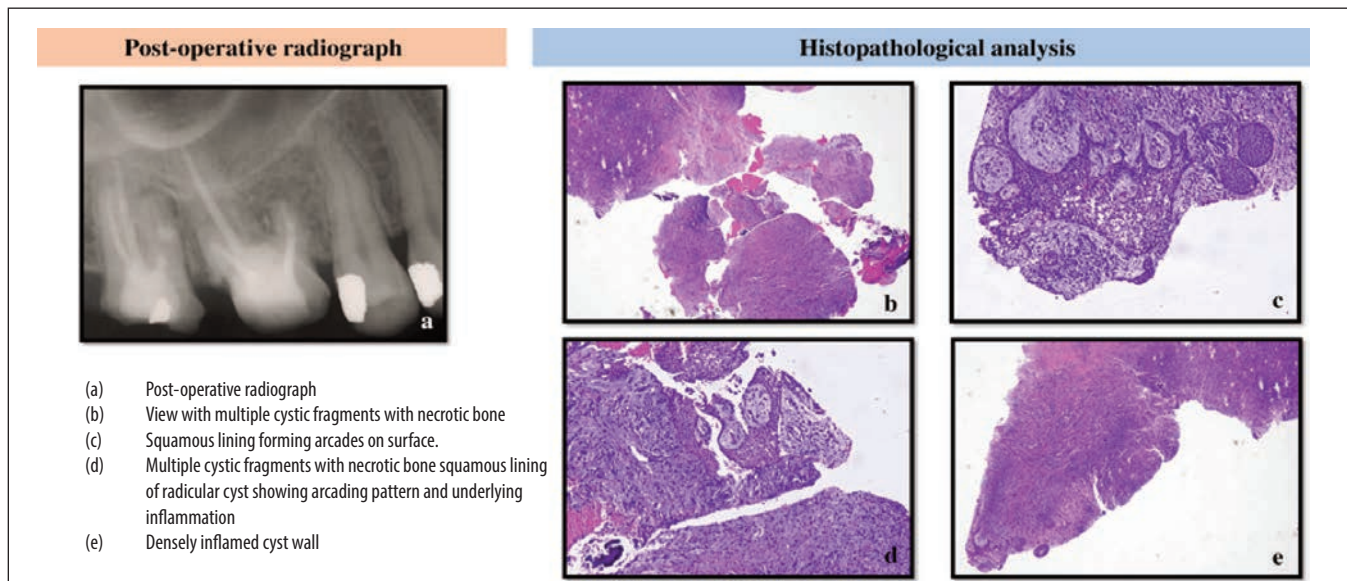


Figure-3:

(figure 3), revealed complete healing of the cystic lesion, according to the criteria by Molven et al.<sup>3</sup>

## Discussion

As evidenced by literature, the diseased teeth were treated via non-surgical orthograde endodontic re-treatment first, with the possibility that these lesions would heal once intra-radicular bacteria were effectively eliminated.<sup>4</sup>

The distinction between two types of cysts can only be made by serial-sectioning of lesions in toto, followed by histopathological analysis, therefore a definitive diagnosis pre-operatively is virtually impossible.<sup>2</sup> However, Ricucci et al. suggest that both true and pocket cysts have essentially the same histopathological and microbial properties, thereby indicating that both cysts should resolve after non-surgical endodontic treatment.<sup>1</sup> In this case, since an abscess was present despite non-surgical retreatment the possibility of this lesion being a true cyst was considered.<sup>5</sup>

Literature suggests decompression of potential true cysts leads to regression and healing by draining inflammatory mediators and necrotic tissue.<sup>5,6</sup> Moreover, considering the challenging access of surgical endodontics in posterior maxilla, the lesion was 'decompressed'.<sup>6,7</sup> One known drawback of this technique is dislodgement of tubing, which occurred in our case on the third day of placement.<sup>6</sup> Two years later, the patient was symptomatic and as a last resort, periapical surgery was planned for both teeth #16 and #17 (figure 3).

To date, there is conflicting evidence on the preferred treatment option for the management of cystic lesions. A predictable pathway of treating such lesions is yet to be paved; as suggested previously, periapical surgery as a first step may seem like the aggressive approach but could prove to be one with less patient morbidity.

## Conclusion

There is no consensus on the protocol for managing persistent periapical lesions. According to the findings of this case report, a more invasive approach could prove to be more predictable in large cystic lesions. Further research is required to address the heterogeneity in literature that favours a more conservative approach to treating such cases.

**Consent:** Consent of the patient was obtained for publishing her case.

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**Conflict of Interest:** None.

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