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Periapical Cysts: A Case Series

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Abstract

Infective organisms cause inflammation and death of the pulpal tissues of the tooth. The progressive disease process following the death of dental pulp, leads to cyst formation. The most common type of cyst in the oral cavity is the periapical cyst, which arises from the epithelial residues in the periodontal ligament as a consequence of inflammation. Here, we report a case series of patients with periapical cyst treated by endodontic treatment followed by surgical approach with mineral tri-oxide aggregate (MTA) plus as the retrograde filling material.

Keywords: *Root Canal Treatment; Cyst; Inflammation; Infections; Mineral Tri-Oxide Aggregate*

Introduction

Infections are not an uncommon incidence anymore and are prevalent in one form or the other in day to day life. They are highly opportunistic in nature and many microorganisms which are normal floral inhabitants are found to be pathogenic in nature when they are excess in nature.

Infective organisms cause inflammation and death of the pulpal tissues of the tooth, whereas an inflammatory disease affecting the supporting structures of the teeth leads to the progressive loss of the connective tissue and the alveolar bone is termed as periodontitis. Even though microbial dental plaque is the primary factor responsible for the disease processes, it is not the sole factor and has been declared multifactorial in nature [1].

The progressive disease process following the death of dental pulp, leads to cyst formation. The most common type of cyst in the oral cavity is the periapical cyst, which arises from the epithelial residues in the periodontal ligament as a consequence of inflammation [2].

Here, we report a case series of patients with periapical cyst treated by endodontic treatment followed by surgical approach with mineral tri-oxide aggregate (MTA) plus as the retrograde filling material.

Case 1

A 22-year-old female patient reported with the chief complaint of swelling on the left side of the face since 2-3 months. Patient gives a previous history of trauma to her front teeth before 8 years. The patient had undergone root canal treatment and was asymptomatic initially however after one month he experienced pain and discomfort.

Case 2

A 20-year-old male patient reported with the chief complaint of pain and swelling, accompanied by pus discharge in the lower chin (anterior) region since 2 months. Patient gives a history of trauma in the lower anterior region, 5 years ago with recurrent swelling and pus discharge.

Case 3

A 26-year-old female patient reported with the chief complaint of swelling in relation to the buccal aspect of 11 and 12. Patient gives a previous history of trauma to her front teeth 4 years ago. Clinical examination revealed grade 1 mobility with respect to 11 with tooth discoloration.

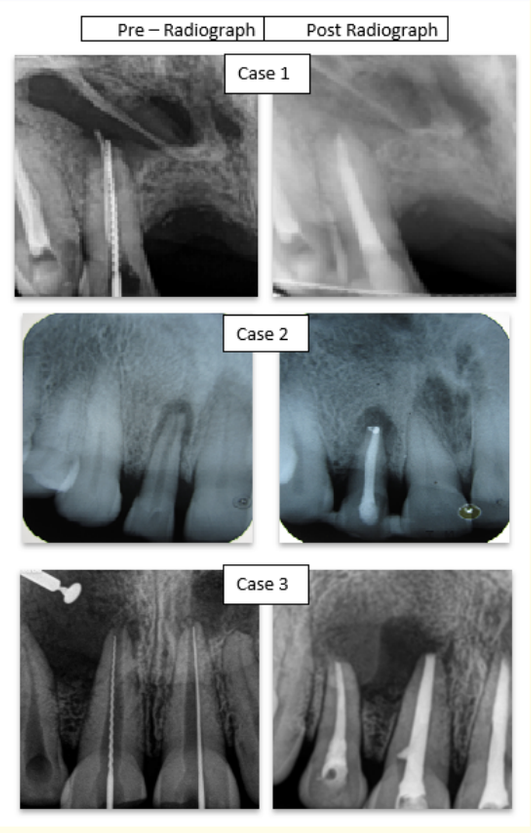
A diagnosis of periapical cyst was rendered based on the clinical and radiographic findings which included trauma, tooth discoloration, tooth mobility and a well-defined radiolucency with radiopaque borders of the affected tooth.

The treatment protocol for all the three cases was standardized wherein the lesion was enucleated (through the elevation of tissue flap) along with curettage (under anesthesia) to ensure complete removal of cystic components including the cystic lining to prevent recurrence.

It was followed by apicectomy and placement of MTA as root end filling material without the use of any bone grafts.

Post-operative instructions were given to the patients and patients were prescribed regular dose of antibiotics and analgesics. Good results were obtained as no complaints other than postoperative swelling and slight amount of pain was revealed by the patients till one week of continuous follow up.

A 6 month follow up was done which showed a slow healing process in the radiolucent apical space, which can be attributed to the non-usage of bone grafts.



Discussion

Periapical cyst also commonly known as radicular cyst or inflammatory cyst is the most common odontogenic cyst, commonly affected teeth are seen in the maxillary anterior region and the most common cited cause being trauma in that region and scarcely by any caries [2].

Periapical cysts arise from the epithelial residues in the periodontal ligament as a consequence of inflammation, usually following the death of dental pulp. The cystic lining is derived from the epithelial cell rests of malaseez which proliferates to form a cyst [2,3].

In all our cases, patients had experienced trauma in the anterior tooth region either maxillary or mandibular and in one case it was treated with root canal but the lesion still persisted and remained unresolved.

The course of a cyst formation after initiation gradually enlarges to involve the adjacent bone and other vital structures in the vicinity. The toxins from the necrotic pulp are released at the apical regions of the tooth, leading to periapical inflammation [3].

Usually a cyst is asymptomatic, however when a cyst gets infected, it causes swelling and pain. Larger cysts may cause bone expansion or displace roots and the alveolar plate may exhibit crepitus when palpated. Other features include discoloration of the tooth, negative results to electric and cold test of the affected tooth, sensitivity to percussion and lymphadenopathy [2,3].

Radiographically, a well circumscribed radiolucency generally round or ovoid with a narrow opaque margin contagious with the lamina dura of the involved tooth [2,3].

The treatment of choice is dependent on the size and localization of the lesion, the bone integrity of the cystic wall and its proximity to vital structures. Due to the large size of the lesion, conservative surgical approach is preferred, mostly marsupialization [5].

In our first case as the patient had undergone root canal treatment, avoiding surgical enucleation and apicectomy was inevitable. In our other two cases, the size of the lesion and the constant pus discharge and swelling after trauma, all made the apicectomy the preferred treatment modality of choice.

We had completely obturated the tooth and had gone ahead with the apicectomy with MTA as the retrograde filling material of choice with the agonistic support of antibiotics. The result being a complete revival for the patient with good results and no complains of pain as seen before. However radiographically we could not appreciate much of difference in size either as an increase or a decrease nor was there a significant change in the radiolucency in the apex of the tooth.

In many cases, even after the lesion is removed there might not be any change in the status of the radiolucency and may appear as an artefact at the root apex, which has been termed as periapical scar [6]. Hence, this should not be confused as the lesion or the disease process.

Mineral Trioxide Aggregate (MTA) was first described in 1993 as a cement used for its use in repairing lateral root perforations [7]. Its composition was described as being primarily a mixture of calcium silicates comprised of calcium oxide (CaO) (50 - 75% w/w) and silicon dioxide (SiO_2) (15 - 25%w/w) [8]. Calcium silicates are not particularly radiopaque, and thus a radiopaque agent such as bismuth oxide was then added [8-10].

MTAs can be separated into two main types, MTA restoratives and MTA sealers, and feature products which are often marketed as bioceramics. These endodontic bioceramics, as with MTA, fall under the categories of MTA restoratives and MTA sealers [9,10].

MTA has been favored due to its higher biocompatibility and sealing ability over the currently available root-end filling materials [9-11]. Set MTA has increased solubility in acidic environments, and these conditions may occur wherever inflammation is present [12]. Hence, we used MTA as the material for retrograde filling of the treated tooth in our cases which did not disappoint us.

Conclusion

As periapical cyst is asymptomatic, slowly progressive, it usually goes unnoticed initially. However secondary infection caused to the cyst may show the presence of the cyst, but during the time period the cyst may enlarge to an enormous size and cause destruction of adjacent bone the vital structures. This clearly calls for the surgical excision of the lesion as the conservative approach for this lesion is completely difficult or impossible at the stage.

In our cases MTA clearly acted as a good retrograde filling material with its superior properties and also surgical enucleation after endodontic procedure was preferred which actually showed us that our treatment planning was completely beneficial for the patient.

Source(s) of Support

Nil.

Conflicts of Interest

Nil.

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