Journal of Pre-Clinical and Clinical Research 2021, Vol 15, No 3, 148-150
www.jpccr.eu

CASE REPORT

Multidisciplinary treatment of radicular cyst caused by delayed trauma in the maxillary central teeth – case report

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A – Research concept and design, B – Collection and/or assembly of data, C – Data analysis and interpretation, D – Writing the article, E – Critical revision of the article, F – Final approval of the article

Altunok Ünlü N, Altan A, Altan H. Multidisciplinary treatment of radicular cyst caused by delayed trauma in the maxillary central teeth – case report. J Pre-Clin Clin Res. 2021; 15(3): 148–150. doi: 10.26444/jpccr/139069

Abstract

Objective. The aim of this case report is to present a multidisciplinary treatment administered to a patient with a cystic lesion in the jawbone, in the root region of the incisors, caused by trauma. The report also emphasizes the effect of accurate diagnosis and treatment planning on the prognosis of cyst-associated teeth in the presence of large cystic lesions.

Case report. A 12-year-old male patient with the maxillary central teeth broken as a result of trauma experienced 3 years ago. In radiographic examination, a round and wide radiolucent area with smooth and distinct borders was observed which included the root of tooth number 11. As a result of the clinical and radiographic examination, it was decided to resect the cyst after consultation with oral and maxillofacial surgery specialists. According to the one-year follow-up results, no pain was felt in the area of the tooth.

Key words

MTA, apexification, radicular cyst, apical resection

INTRODUCTION

Odontogenic cysts are unique because they affect only the oral and maxillofacial region [1]. They occur in the third decade of life and are more common in men. Among such lesions, radicular cysts are the most common type of inflammatory odontogenic cysts and are most frequently seen and more widespread in the maxillary anterior region [2, 3]. Possible radiological progress of a radicular cyst starts as a small radiolucent lesion at the root of a non-vital tooth or at the apex of a remaining root, similar to periapical granuloma [4]. Most cysts are asymptomatic but especially infected cysts might cause pain [5]. Additionally, if such lesions reach a certain size, they might cause some symptoms in neighboring teeth, such as repositioning, mobility, expansion or paresthesia [4]. Small cysts are treated with root canal therapy and apical resection. For larger cysts it might be necessary to extract the related tooth. Another treatment option could be marsupialization [6]. Nowadays, it is believed that extracting the tooth is unnecessary, and even classical root canal treatment would be sufficient for the treatment of many cyst lesions [7].

When teeth are not treated due to decay or trauma, they lose their vitality, resulting in pulpal necrosis. This situation halts growth and development, especially at the roots of immature permanent teeth [8]. Because the teeth that require treatment have open apices, apical barriers have to be formed on root ends to complete endodontic treatment. For teeth with open apices that have pulpal necrosis, MTA can be used on its own or as a barrier material [9]. MTA is the most preferred filling material to be used at single session apexification due to its strong physical, chemical, and clinical properties at the apical region. This treatment is also bacteriostatic, and together with its dimensional stability, radio-opacity, biocompatibility, and impermeability properties, creates a good hard tissue barrier [10].

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Received: 18.04.2021; accepted: 16.06.2021; first published: 30.06.2021

CASE REPORT

An 11-year-old male patient reported to our clinic with a broken tooth complaint. When anamnesis was received, it was learned that as a result of a trauma received three years previously, the maxillary central teeth were broken. Clinical examination revealed enamel-dentine fracture on teeth numbered 11 and 21 (Fig. 1). No pathological formations or percussion were observed on soft tissue or any sensitivity on palpation. As a result of cold test conducted on mobile tooth

Figure 1. Enamel-dentin fracture observed in teeth 11 and 21 during intraoral examination

number 11, vitality was detected to be negative. On tooth number 21 and the neighbouring teeth, vitality test gave a positive response and mobility was observed. At radiographic examination, a round and wide radiolucent area with neat and clear-cut lines was detected which also covered the root of tooth number 11 (Fig. 2). As a result of clinical and radiographic examination, the lesion was thought to be a cyst and root canal therapy was started on tooth number 11.

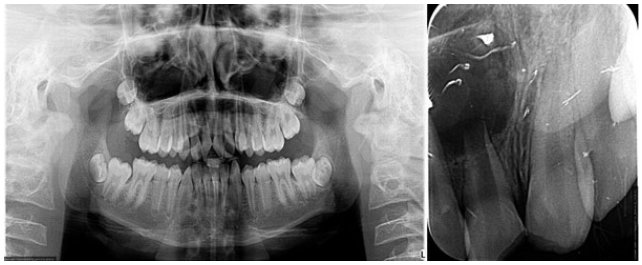

Figure 2. Periapical cyst observed in the panoramic and periapical radiographs of the patient

Root canal therapy protocol. After topical anesthesia, local anesthesia (Aventis Pharma, Istanbul, Turkey) was performed. Tooth number 11 was isolated with a rubber dam (Royal Shield Powder Dental Dams, Malesia) and clamps (YDM, Tokyo, Japan), following which the inlet cavity was opened with diamond fissure burs (Meisinger, Germany). Using flexible nickel titanium hand files (Kerr-files; Maillefer, Ballaigues, Switzerland), it was determined in radiography that the extent of the work was 2 mm shorter than the radiographic apex. At instrumentation intervals canals were irrigated with 1.5–2 mL 0.2% chlorhexidine (ProChex, Promida Co., Turkey). Final irrigation was made with 0.2% chlorhexidine followed by 10 mL sterile saline for one minute, and finally, 10 mL 2.5% NaOCI solution was used to irrigate the root canal. The canals were dried with premeasured paper points (PearlEndo, Gyonggi-Do, Korea). Calcium hydroxide was mixed in the form of a cream and placed on the root canal using a lentulo spiral. Glass-ionomer cement was used as temporary restoration material.

At the second session,the temporary filling material was removed after isolation. The root canal was irrigated with 10 mL sterile saline 2.5% NaOCI solution. After drying with paper points, in order to create apical barrier, the apical was closed for 3–4 mm with MTA. Tooth number 11 was temporarily closed with a humidified cotton pellet and glass ionomer to wait for the MTA to harden.

After placing orthograde MTA in the canal, the patient was referred for oral and maxillofacial Surgery for apical resection. The gingival tissue covering cystic tissue was lifted in an operation using flap application. When the flap was lifted, it was revealed that the cystic cavity had completely resorbed the cortical bone on the buccal surface (Fig. 3). When the cystic tissue was completely removed from the cavity, apical 2–3 mm parts of tooth number of 11 in the cavity were removed with resection procedure. Afterwards, the area of the operation was thoroughly cleaned using normal saline, and the flap was again sutured following which the operation area was closed. Two weeks after surgical procedure, canal filling of tooth number 11 was completed with canal filling path (AH Plus, Dentsply DeTrey, Germany) and the warm gutta percha technique. Teeth numbered 11–21 were restored using composite filling material (Estelite

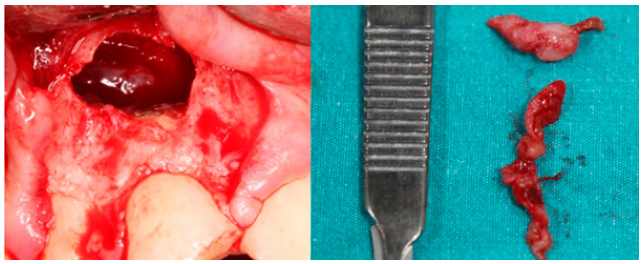

Figure 3. Intraoral photograph taken during the surgical operation and excised cystic tissue fragments

Quick, Tokuyama Dental Co., Tokyo, Japan) to complete the treatment (Fig. 4). Results of the one-year follow-up of the patient are presented in this case report and routine follow-up is continuing (Fig. 5).

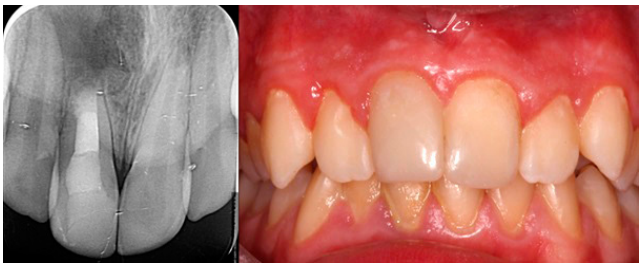

Figure 4. Periapical and intraoral views after treatment

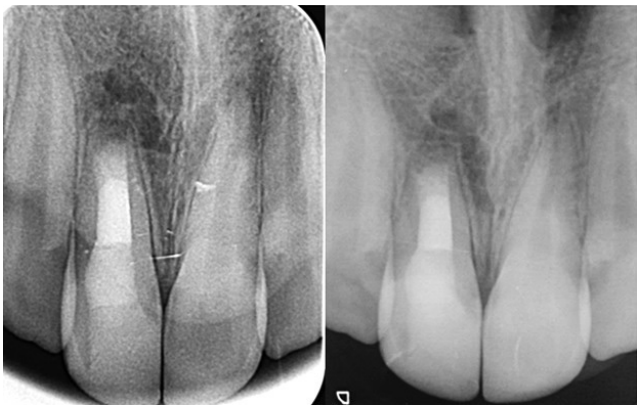

Figure 5. Periapical radiography results of the patient for 6 months and 1 year, respectively

DISCUSSION

Radicular cysts grow slowly and usually do not reach major sizes. Cystic cavities usually do not cause pain unless infected. Large cysts might cause loss of mobility and vitality in teeth [11]. In the presented case, because the cystic cavity was not infected, it remained symptom-free for a long time. Regarding the radicular cyst, there was mobility of the maxillary right central tooth, and the result of cold test was negative.

Many clinicians agree that most radicular cysts would heal following root canal therapy, and success has been recorded by as many as 85–90% of clinicians [12]. Many clinicians recommend conventional endodontic treatment for lesions smaller than 1 cm, although there is an ongoing discussion on the treatment for larger lesions. Clinicians also advocate that following conventional endodontic treatment, treatment must be evaluated at least one year, indicating that only if

healing has not achieved at the end of this period, surgery should be considered [13]. However, some authors suggest complete enucleation of cystic lesions smaller than 3 cm, together with epithelium and marsupialization for lesions larger than 3 cm [14]. In the presented case, the cystic cavity was larger than 1 cm, which was the reason for surgery being considered necessary.

Although the clinical success of conventional apexification treatment using many calcium hydroxide dressings applied on open apex teeth with pulpal necrosis is unclear, in the apexification method using MTA it is possible to foresee clinical success [15]. In the presented case, MTA apexification was preferred for observing healing in a small number of sessions.

In one of their studies, Hachmeister et. al discovered that, compared to 20% of MTA retrograde fillings in a control group, 100% of MTA orthograde fillings demonstrated bacterial penetration on day 70. The authors argued that MTA was not the cause of the observed leak but that the intracanal application method caused this result [16]. In the presented case, although orthograde MTA application was made instead of retrograde, the cyst was observed to have healed with excision.

RESULT

Using MTA as an apical barrier in order to reduce the number of sessions in radicular cyst treatment and minimize the risk of contamination by bacteria in cyst region, every session would have a positive impact on treatment prognosis.

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