

Non-Surgical Endodontic Treatment of a Large Periapical Lesion: Case Report

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Abstract

The choice between endodontic treatment and periapical surgery for large periapical lesions has been a topic of debate in clinical practice for many years. The advancement of materials and techniques of endodontic treatment resulted in more teeth preservation and minimize the need for surgical intervention. Although many large lesions are treated by surgery, non- surgical root canal treatment is an alternative option. Therefore, the teeth with large periapical lesions verified radiographically were enrolled and a decision was taken to proceed with a root canal treatment.

In this clinical case report, the swelling and periapical lesion in the upper left anterior region was determined to originate from the lateral tooth, and it was managed with root canal treatment without surgical intervention and followed up. Healing was observed in the periapical region during the controls performed at four and 16 months. The teeth with a large periapical lesion demonstrated favourable outcomes at the conclusion of the follow-up periods. Non-surgical root canal treatment represents the optimal initial treatment for teeth exhibiting a large periapical lesion.

Keywords

Periapical lesion; Non-Surgical Endodontic treatment; CBCT

Introduction

Periapical lesions are the result of microbial activity originating from necrotic pulp tissue or the presence of foreign bodies within the periapical tissue. In the presence of bacteria and their by-products, the periapical tissues start an immunological response, which ultimately leads to the development of periapical lesions [1].

Chronic periapical lesions are typically categorised as dental granulomas, radicular cysts or abscesses. In order to define radicular cyst or apical granuloma, histological examinations are needed in addition to radiographs. Radiographic examination of apical lesions cannot differentiate between cysts or granulomas [2].

The most important factor in the successful treatment of periapical lesions is the elimination of bacteria from the root canal. The objective of conventional root canal treatment is the elimination of bacteria to the greatest extent possible [3].

The range of treatment options for large periapical lesions comprises non-surgical root canal therapy and/or apical surgery, in addition to extraction. However, in line with minimally invasive endodontics, most inflammatory periapical lesions are effectively treated with non-surgical endodontic therapy. The objective of this methodology is to eliminate or reduce the bacterial load within the root canal system, thus establishing an optimal biological milieu conducive to the resolution of periapical lesions [4, 5].

The purpose of this case report is to present the healing of the periapical tissue in the long term after non-surgical root canal treatment of the left upper lateral tooth lesion, with a cyst-like periapical.

Case report

21-year-old patient referred to the Endodontics department of Uskudar Oral and Dental Health Center with complaints of swelling and pain in the upper left anterior region. In the clinical examination, it was observed that palpation resulted in the occurrence of pain, and that the upper left anterior region exhibited swelling. In the periapical radiological examination, a significant radiolucent area was identified in the apical regions of teeth #21, 22 and 23 (Figure 1).



Figure 1: A periapical radiograph showing periapical lesion area.

The use of a Cone Beam Computed Tomography (CBCT) imaging technique revealed the presence of a

sustained radiolucency in association with the second, third and fourth mandibular teeth (#21, 22 and 23, respectively) and also demonstrated the servical internal resorbtion (Figure 2-4).

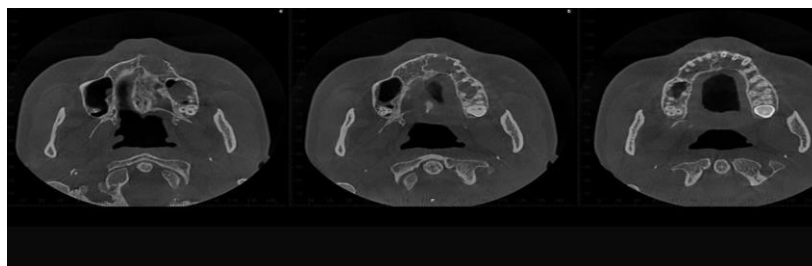


Figure 2: CBCT, Showing axial section.

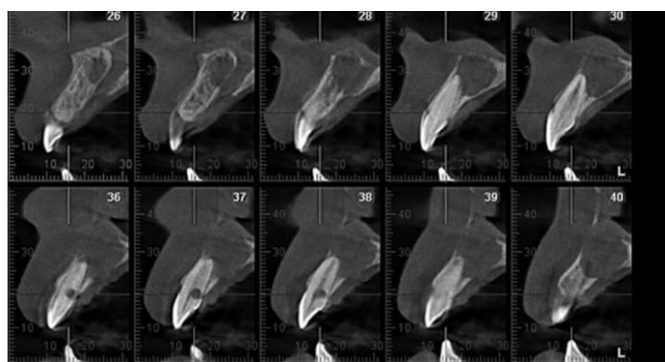


Figure 3: CBCT, showing axial section.

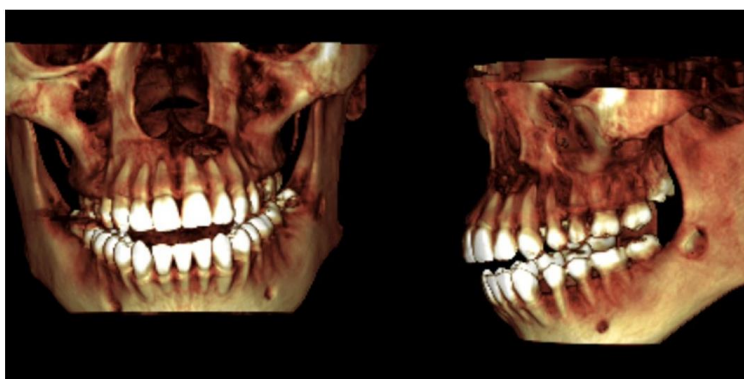


Figure 4: CBCT, Dimensional views

The clinical examination yielded a diagnosis of chronic apical periodontitis, which was determined to be the result of traumatic occlusion. The vitality test (C-Pulse Pulp Tester Digital Vitalometer, Coxo, China) showed a negative response for the lateral tooth, while the canine and central teeth showed positive responses. Therefore, root canal treatment was initiated only for the lateral tooth. The tooth were accessed under rubber dam isolation. After accessed the canal, a #15 K-type file was carried to the apex, and it was observed that the canal was filled with yellow cystic fluid. The working length was measured with an electronic apex locator (VDW Resiproc Endomotor, Gmbh, Germany). The root canals

were cleaned and shaped using the step-back method using K and H-type hand files to obtain the apical region in the size of a #50 instrument (Dentsply Maillefer, Ballaigues, Switzerland) file and irrigated with 2.5% sodium hypochlorite. A sterile 27-gauge syringe was used to aspirate the cyst-like fluid from the lesion cavity by extruding it apically through the canal (Figure 5).



Figure 5: A sterile 27-gauge syringe was used to aspirate the cyst-fluid.

The drainage procedure was performed once a week for ten weeks to allow the accumulation of serous fluid to be drained and to prevent the root canal from frequently opening to the oral environment, which could lead to a new infection. After the drainage was stopped, the treatment was continued by applying calcium hydroxide at one-week intervals for 3 weeks. The canals were then dried and calcium hydroxide in injectable form was injected into the root canals and the tooth was covered with temporary filling material. When the paste started to come out of the root canal dry and clean, the calcium hydroxide application was terminated. Root canal treatment was completed with the lateral condensation technique and mineral-trioxide- aggregate (MTA Fillapex) placed into servical resorbtion area. The access cavity was restored with resin composite (Figure 6).



Figure 6: Post treatment root canal radiography

Four months after the completion of treatment, during the follow-up examination, it was observed that the expansions in the hard and soft tissues of the maxillary left lateral tooth had resolved, the patient's complaints in the palatal area had disappeared, and the radiographs showed signs of healing (Figure 7).



Figure 7: Postoperative four months follow-up radiography.

It was determined that after 16 months; the periapical lesions had completely healed both clinically and radiologically as a result of endodontic treatment, without the need for surgical intervention (Figure 8).



Figure 8: Postoperative sixteen months follow-up radiography.

Discussion

The current approach for the treatment of teeth with large periapical lesions is to first perform non-surgical endodontic treatment. It has been stated that eliminating irritants within the root canal has a stimulating effect on the immune system, which accelerates periapical healing. When root canal treatment is insufficient, an apical surgical procedure may be performed. In the literature, there are many cases where non-surgical endodontic treatment applied to large lesions has yielded successful results. In this case, in line with the supporting literature, a non-surgical endodontic treatment option was chosen. The majority of traumatic dental injuries involve the anterior teeth. Trauma has been observed to be the most common etiological factor in the development of pulp necrosis and periapical lesions [6, 7].

In this case, a large periapical lesion is observed, which is thought to be caused by occlusal trauma. The sample contained microorganisms that originated from necrotic pulp, which resulted from trauma. This led to the development of periapical infections and subsequent bone destruction.

Drainage is important step for the conservative treatment of large periapical lesions. Fernandes and Ataide say that large periapical lesions can heal through a drainage technique using aspiration. As drainage is performed, a reduction in symptoms can be observed. In our case, the syringe placed in the canal was carried apically and the serous fluid in the lesion was aspirated to achieve decompression [9].

In this case, periodic clinical examination and radiographic examinations were performed and a 16-month follow-up interval was achieved. According to the guidelines of the European Endodontic Association, the first check-up should be done in 12 months, and if no clear improvement is observed, further evaluation should be done after 4 years [10].

As a result, it is thought that the treatment of large periapical lesions can be successful without a surgical approach by removing the infected materials in the root canal with biomechanical and chemical preparation, providing effective disinfection and achieving complete apical sealing with root canal filling.

Conclusion

As a result, it is thought that successful root canal treatment with the removal of infected materials in the root canal will be successful in the treatment of large periapical lesions without a surgical approach.

References

1. Nair PNR. (2006) On the causes of persistent apical periodontitis: a review. *Int Endod J.* 39(4):249-281.
2. Bhaskar SN. (1966) Periapical lesions: types, incidence, and clinical features. *Oral Surg Oral Med Oral Pathol.* 21:657-71.
3. Weiger R, Rosendahl R, Löst C. (2000) Influence of calcium hydroxide intracanal dressings on the prognosis of teeth with endodontically-induced periapical lesions. *Int Endod J.* 33:219-26.
4. Ng YL, Mann V, Gulabivala K. (2011) A prospective study of the factors affecting outcomes of nonsurgical root canal treatment. Part 1: Periapical health. *Int Endod J.* 44(7):583-609.
5. Soares JA, Brito-Junior M, Silveira FF, Nunes E, Santos SMC. (2008) Favorable response of an extensive periapical lesion to root canal treatment. *J Oral Sci.* 50:107-11.
6. Oztan MD. (2002) Endodontic treatment of teeth associated with a large periapical lesion. *Int Endod J.* 35:73-78.
7. Caliskan MK. (2004) Prognosis of large cyst-like periapical lesions following nonsurgical root canal treatment: a clinical review. *Int Endod J.* 37:408-16.
8. Tanomaru-Filho M, Jorge EG, Duarte MA, Goncalves M and Guerreiro-Tanomaru JM. (2009) Comparative radiographic and histological analyses of periapical lesion development. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 107(3):442-47.
9. Fernandes M, De Ataíde I. (2010) Non-surgical management of a large periapical lesion using a simple aspiration technique: a case report. *Int Endod J.* 43(6):536-42.
10. European Society of Endodontology. (2006) Quality guidelines for endodontic treatment: consensus report of the European Society of Endodontology. *Int Endod J.* 39(12):921-30.