

NON-SURGICAL ENDODONTIC TREATMENTS OF TEETH ASSOCIATED WITH LARGE PERIAPICAL LESIONS

GENİŞ PERİAPİKAL LEZYONLU DİŞLERİN CERRAHİ GİRİŞİMSİZ KÖK KANAL TEDAVİLERİ

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ABSTRACT

The aim of this paper is to present the non-surgical management of three cases with large periapical lesions. The first case was a mandibular left canine with periapical lesion of endodontic origin in a 29 year-old female patient with extra oral fistula, in the second case a maxillary left central incisor was affected in a 23 year-old female patient and the third case was a maxillary right central incisor in a 21 year-old female patient. The root canals were prepared and filled with calcium hydroxide as an intra-canal medicament. Clinical evaluation was performed after seven days. After the first week, root canal obturations were performed with gutta-percha and Sealapex sealer. The clinical and radiographic examination after 1 year revealed complete repair. These case reports showed that root canal treatment succeed in the healing of large periapical lesions.

Key Words: Non-surgical Endodontic Treatment; Periapical lesion; Calcium Hydroxide

ÖZET

Bu makalenin amacı geniş periapikal lezyonlu üç vakanın cerrahi girişimsiz tedavilerinin sunulmasıdır. İlk vaka ekstraoral fistüle sahip olan 29 yaşındaki bayan hastada endodontik kaynaklı periapikal lezyonlu mandibular sol kanindi, ikinci vakada 23 yaşında bayan hastada maksiller sol santral kesiciydi ve üçüncü vaka ise 21 yaşında bayan hastada maksiller sağ santral kesici idi. Kök kanalları prepare edildi ve kanal içi medikament olarak kalsiyum hidroksitle dolduruldu. Yedi gün sonra klinik inceleme yapıldı. İlk 1 haftadan sonra , kök kanalları gütaperka ve sealapex sealer ile dolduruldu. Bir yıl sonra klinik ve radyografik inceleme tam iyileşmeyi ortaya koydu. Bu vaka raporları kök kanal tedavisinin geniş periapikal lezyonların iyileşmesinde başarılı olduğunu göstermiştir.

Anahtar kelimeler: Cerrahi olmayan endodontik tedavi; Periapikal lezyon; Kalsiyum Hidroksit.

INTRODUCTION

Inflammation of pulpal or periradicular tissues result from irritants which could be classified as living (microorganisms and viruses) and non- living irritants (mechanical, thermal and chemical irritants). Mild to moderate injuries of short duration cause reversible tissue damage and recovery of these tissues. Persistent and/or severe injuries usually cause irreversible changes in the pulp¹. The persistence etiologic factors that cannot be eliminated from

the root canal system by the host organism, such as microorganisms, dead cells remnants, foreign bodies and bacterial metabolic products, can result in a chronic inflammatory process².

Differential diagnosis of periradicular pathosis is essential and confusing. As for differential diagnose of these lesions, the examination radiographic is not alone adequate for diagnose. Well-defined radiolucent lesions surrounding tooth may present problems in determining treatment strategies. It was reported that elimination of bacteria from the

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root canal is most important factor for the successful treatment of periapical lesion, and the lack of recession of such lesions is generally assigned to the persistence of bacteria inside root canal with the possibility of the additional factors². Conventional root canal treatment is aimed primarily at eliminating these bacteria as completely as possible³.

Treatment options to manage large periapical lesions range from non-surgical root canal treatment and/or apical surgery to extraction. Current philosophy in the treatment of the teeth with large periapical lesions includes the initial use of non-surgical treatment. When this treatment is not successful in resolving the periradicular pathosis additional treatment options should be considered⁴.

The following reports include the non-surgical management of three cases with periapical lesions.

CASE REPORT 1

A 29 year old female patient was referred to the Department of Endodontics in the dental faculty of Ataturk University for the treatment of swelling with extra oral fistula at the left mandibular region. Clinical examination revealed a porcelain/metal bridge including left mandibular canine and left mandibular second premolar. The porcelain/metal bridge was extracted, and then a periapical and an occlusal radiograph were taken. When the radiographs were examined, a large periapical lesion (approximately 7 mm) was seen around the apex of the left mandibular canine (Figure 1A). Radiographic evaluation demonstrated also a calcified canal. Mandibular left canine failed to respond to electric pulp testing. The tooth was intensively sensitive to percussion and palpation and there was mobility. Periodontal probing revealed a normal intact gingiva.

A non-surgical endodontic therapy was planned. After applying rubber dam, the access cavity was prepared without local anesthesia. There was drainage from the canine tooth. Working length was determined by an electronic apex locator (Propex, Dentsply-Maillefer). Canal preparation was conducted using crown down technique. During the preparation, 2, 5 % sodium hypochlorite irrigation solution was administered between each file. After sufficient drainage, the tooth was temporarily restored with Cavit (ESPE Dental AG, Seefeld, Germany) and the

patient recalled one day later. Any medication was not given to the patient. The following day, the rubber dam was applied and then the Cavit was removed, there was slightly drainage from the root canal. The canal was irrigated with sodium hypochlorite and calcium hydroxide paste was placed into the canal with lentulo filler.

Clinical examination was performed after seven days. Tooth was asymptomatic, the fistula was healed and there was no mobility. The canal was obturated by the lateral condensation technique using gutta-percha and Sealapex sealer (Kerr, Italy) (Figure 1B). The patient was recalled for control. After one year, the patient exhibited healthy dental structures, and the absence of the radiolucent periapical lesion (Fig. 1C, 1D). In spite of the extra oral fistula was healed one week after the first visit, there was a residual scar tissue that was seen slightly after one year. Surgical correction was considered unnecessary.

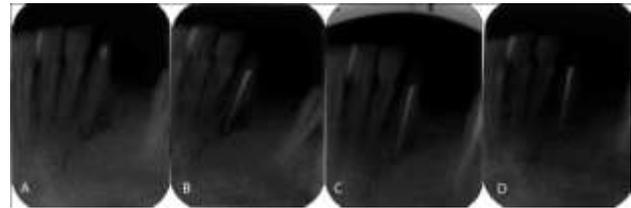


Figure 1: (A) Initial radiograph revealed large periapical lesion, (B) Radiograph of the root canal obturation, (C) Radiograph at one year, revealing complete repair.

CASE REPORT 2

A 23 year old female patient was referred to the Department of Endodontics in the dental Faculty of Ataturk University. The reason for consultation was completion of root canal therapy on the maxillary left central incisor tooth, which had been left unfinished with an open cavity. Clinical examination revealed that a tooth was discolored, with a composite restoration and slightly sensitive to percussion and palpation but there was no mobility. The left central incisor failed to respond to thermal and electric testing. Radiographic evaluation demonstrated a wide canal and a radiolucent lesion approximately 7 mm in diameter around the apex (Figure 2A).

A non-surgical endodontic therapy of the maxillary left lateral incisor was planned. After applying rubber dam, the access cavity was prepared without local anesthesia. The canal was prepared as the same of the previous case report and was temporarily restored with Cavit (ESPE Dental AG, Seefeld, Germany). Clinical evaluation was performed after seven days. Tooth was asymptomatic and the canal was obturated by the lateral condensation technique using gutta-percha and Sealapex sealer (Kerr, Italy) (Figure 2B). Then the coronal part of the root filling material was removed and a fiber post placed. The patient was recalled for control. After one year, the patient exhibited healthy dental structures, and the absence of the radiolucent periapical lesion (Figure 2C).



Figure 2: (A) Initial radiograph revealed large periapical lesion, (B) Radiograph after obturation, (C) Radiograph one year later.

CASE REPORT 3

A 21 year old female patient was referred to the Department of Endodontics in the dental faculty of Ataturk University for treatment of maxillary right central incisor tooth. Clinical examinations revealed that a tooth was discolored, with a composite restoration and slightly sensitive to percussion and palpation but there was no mobility. Clinical examination of soft tissues revealed fistulae. The right maxillary central incisor failed to respond to thermal and electric testing. Radiographic evaluation demonstrated a radiolucent lesion approximately 9 mm in diameter around the apex (Figure 3A).

A non-surgical endodontic therapy of the maxillary left lateral incisor was planned. After applying rubber dam, the access cavity was prepared

without local anesthesia. The canal was prepared as the same of the previous case report and was temporarily restored with Cavit (ESPE Dental AG, Seefeld, Germany). Clinical evaluation was performed after seven days. Tooth was asymptomatic and the canal was obturated by the lateral condensation technique using gutta-percha and Sealapex sealer (Kerr, Italy) (Figure 3B). The patient was recalled for control. After one year, the patient exhibited healthy dental structures, and the absence of the radiolucent periapical lesion (Figure 3C).



Figure 3: (A) Initial radiograph revealed a large periapical lesion, (B) Radiograph at the final of endodontic treatment, (C) Radiograph at one year, revealing complete repair.

DISCUSSION

Radiographic evaluation is the most widely used method for detection of periapical lesions. Periapical lesions can be detected radiographically only when loss of alveolar bone is accompanied by cortical bone involvement during the development of the periapical pathological process. For this reason periapical lesions in their earlier stages may not be visualized⁵.

Calcium hydroxide ($\text{Ca}(\text{OH})_2$) is an intracanal medicament that is commonly used because of its ability to predictably disinfect the RCS. The mechanisms of $\text{Ca}(\text{OH})_2$ are not fully understood. Additionally its biological properties are achieved by the dissociation in Ca^{2+} and OH^- ions⁶. The antimicrobial effects of calcium hydroxide relate directly to its high pH 12.5, it has a destructive effect on cell membranes and protein structures⁷. Because it plays a major role as an interappointments dressing in the disinfection of the root canal system, a $\text{Ca}(\text{OH})_2$ based paste was used as an antibacterial dressing in this case.

The drainage is important for the conservative management of large periapical lesions. Fernandes and Ataide have demonstrated that large periapical lesion healed using an aspiration technique for the drainage⁸. When drainage is obtained, the symptoms are reduced without systemic antibiotics⁹. In the present cases, root canal treatments were carried out in two visits without antibiotics.

When they are associated with the clinical finding that the tooth was asymptomatic and the soft tissue was healthy, radiographic signs such as density change within the lesion, trabecular reformation and lamina dura formation confirmed healing particularly¹⁰. Çalışkan stated that in approximately 70% of cases with periapical lesion, the healing was apparent within 2 years of treatment¹¹. However some authors reported that some cases with periapical lesions had completely disappeared from 1 to 12 months after the treatment^{12, 13}. In the present paper, we observed that periapical healings completed during the 12 months observation time.

Previous therapies used for teeth with pulpal necrosis and extra oral sinus tracts included extraction of the affected tooth¹⁴. Additionally the sinus tract has been treated with several different therapies, ranging from phenol cauterization to apicectomy combined fistula curettage¹⁵. Recently, sinus tracts of endodontic origin require no special therapy because they heal after appropriate root canal treatment^{15, 16}. In fact, the fistula in the case report one healed at the beginning of the endodontic therapy, and after one year there was a residual scar tissue that was seen slightly enough not to be needed surgical correction.

Radiographic signs such as density change within the lesion, trabecular reformation and lamina dura formation confirmed healing, particularly when associated with the clinical finding that the tooth was asymptomatic and the soft tissue was healthy¹⁰. Some authors declared that a period of more than 2 years is able to determine the final treatment result of these lesions². In the present cases, recession of the lesions by a non- surgical approach was evident after 1 year.

CONCLUSION

In this case report, root canal treatment proved successful in promoting the healing of large periapical lesions. This confirms that even large periapical

lesions can respond favorable to non- surgical treatment. Non-surgical approaches should be considered before attempting to surgery.

REFERENCES

1. Ingle JI, Bakland LK. Endodontics. 5th ed. Hamilton, London: BC Decker Inc; 2002.
2. Broon NJ, Bortoluzzi EA, Bramante CM. Repair of large periapical radiolucent lesions of endodontic origin without surgical treatment. Aust Endod J 2007;33(1):36-41.
3. Weiger R, Rosendahl R, Lost C. Influence of calcium hydroxide intracanal dressings on the prognosis of teeth with endodontically induced periapical lesions. International Endodontic Journal 2000;33(3):219-26.
4. Hoen MM, LaBounty GL, Strittmatter EJ. Conservative treatment of persistent periradicular lesions using aspiration and irrigation. J Endod 1990;16(4):182-86.
5. Tanomaru-Filho M, Jorge EG, Duarte MA, Goncalves M, Guerreiro-Tanomaru JM. Comparative radiographic and histological analyses of periapical lesion development. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2009; 107(3):442-7.
6. Fava LR, Saunders WP. Calcium hydroxide pastes: classification and clinical indications. Int Endod J 1999;32(4):257-82.
7. Pacios MG, de la Casa ML, de los Angeles Bulacio M, Lopez ME. Calcium hydroxide's association with different vehicles: In vitro action on some dentinal components. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2003;96(1):96-101.
8. Fernandes M, De Ataide I. Non-surgical management of a large periapical lesion using a simple aspiration technique: a case report. International Endodontic Journal 2010;43(6):536-42.
9. Çalışkan MK. Prognosis of large cyst-like periapical lesions following nonsurgical root canal treatment: a clinical review. International Endodontic Journal 2004;37(6):408-16.
10. Saatchi M. Healing of large periapical lesion: a non-surgical endodontic treatment approach. Aust Endod J 2007;33(3):136-40.



11. Caliskan MK. Prognosis of large cyst-like periapical lesions following nonsurgical root canal treatment: a clinical review. *Int Endod J* 2004;37(6):408-16.
12. Caliskan MK, Turkun M. Periapical repair and apical closure of a pulpless tooth using calcium hydroxide. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 1997;84(6):683-7.
13. Oztan MD. Endodontic treatment of teeth associated with a large periapical lesion. *Int Endod J* 2002;35(1):73-8.
14. Salamat K, Rezai RF. Nonsurgical treatment of extraoral lesions caused by necrotic nonvital tooth. *Oral surgery, oral medicine, and oral pathology* 1986;61(6):618-23.
15. Baumgartner JC, Picket AB, Muller JT. Microscopic examination of oral sinus tracts and their associated periapical lesions. *Journal of Endodontics* 1984;10(4):146-52.
16. Fowler EB, Breault LG, Galvan DA. Nasal fistula associated with dental infection: a report of a case. *Journal of Endodontics* 2000;26(6):374-6.

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