RETREATMENT OF TEETH WITH SECONDARY ACUTE APICAL PERIODONTITIS: A CASE REPORT

SEKONDER AKUT APİKAL PERİODONTİTİSLİ DİŞLERİN TEKRAR TEDAVİSİ:BİR VAKA SUNUMU

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Abstract

This case report presents the non-surgical endodontic retreatment of a 21-year-old female patient diagnosed with secondary acute apical periodontitis. The patient reported pain localized in the upper left incisors. Clinical and radiographic examination revealed percussion sensitivity, a periapical radiolucent lesion, and inadequate root canal obturation. The primary objective of endodontic treatment is to effectively clean and debride the root canal system to eliminate infection and prevent reinfection. When initial treatment fails, retreatment, surgical intervention, or extraction may be considered. In this case, orthograde retreatment was chosen due to accessible canals and its higher success rate compared to surgical approaches. The retreatment procedure included the removal of the previous filling, cleaning and shaping of the canals with rotary files under irrigation with sodium hypochlorite, and the placement of calcium hydroxide as an intracanal medicament. At the eight-month follow-up, the patient was asymptomatic, and radiographs confirmed the healing of periapical tissues, indicating a favorable clinical outcome. This case highlights the effectiveness of non-surgical retreatment in managing persistent apical periodontitis.

Keywords: Retreatment, MTA, periapical lesion, root canal failure

Öz

Bu olgu sunumu, sekonder akut apikal periodontitis tanısı konulan 21 yaşındaki kadın hastaya uygulanan cerrahi olmayan endodontik retreatmanı anlatmaktadır. Hasta, üst sol kesici dişlerinde lokalize ağrı şikayetiyle başvurmuştur. Klinik ve radyografik muayenede, perküsyon hassasiyeti, periapikal radyolüsent lezyon ve yetersiz kanal dolumu tespit edilmiştir. Endodontik tedavinin temel amacı, enfeksiyonu ortadan kaldırmak ve yeniden enfeksiyon oluşumunu önlemek için kök kanal sisteminin etkin bir şekilde temizlenmesi ve debride edilmesidir. İlk tedavinin başarısız olması durumunda yeniden tedavi, cerrahi müdahale veya diş çekimi gibi alternatifler değerlendirilmelidir. Bu vakada, kök kanallarına erişimin mümkün olması ve cerrahi yöntemlere göre daha yüksek başarı oranına sahip olması nedeniyle ortograd (cerrahi olmayan) retreatman tercih edilmiştir. Tedavi sürecinde, önceki kanal dolumu uzaklaştırılmış, döner eğelerle şekillendirme ve 5.2% sodyum hipoklorit ile irrigasyon yapılmış ve ardından kanal içine medikament olarak kalsiyum hidroksit yerleştirilmiştir. Sekiz aylık takip sonunda, hasta asemptomatik hale gelmiş ve radyografik olarak periapikal dokuların iyileştiği gözlemlenmiştir. Bu vaka, inatçı apikal periodontitis olgularında cerrahi olmayan retreatmanın etkinliğini ortaya koymaktadır.

Anahtar Kelimeler: Retreatment, MTA, periapikal lezyon, kök kanal tedavisi başarısızlığı.

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1. Introduction

Endodontic treatment aims to eliminate infection from the root canal system by thoroughly cleaning, debriding, and shaping the canals before sealing them with an inert, biocompatible material. This process is critical for preventing bacterial reinfection and ensuring long-term tooth preservation (Hargreaves, 2010). However, root canal treatment may sometimes fail due to a variety of factors, including overextended or underfilled canals, untreated or missed canals, inadequate apical sealing, or microleakage resulting from coronal restoration failure (Sağlam, 2021). These technical or biological shortcomings can lead to persistent periapical pathology and clinical symptoms such as pain or swelling.

When endodontic treatment fails, clinicians must consider several management options, including non-surgical retreatment, periradicular (apical) surgery, or extraction of the affected tooth (Brochado, 2023). Among these, non-surgical retreatment is generally preferred as a first-line approach when canal access is feasible, owing to its higher success rates and less invasive nature. Successful outcomes in retreatment depend not only on the removal of the previous root filling material but also on proper canal disinfection, shaping, and the application of an appropriate obturation technique. Therefore, factors such as accurate case selection, use of modern equipment, appropriate irrigation protocols, and a thorough assessment of the prognosis are essential for achieving clinical success (Dioguardi, 2022).

This case report presents the non-surgical endodontic retreatment of a maxillary incisor with persistent apical periodontitis, highlighting the effectiveness of orthograde retreatment in managing failed primary endodontic therapy.

2. Case Report

A 21-year-old female patient presented to the Department of Endodontics at the Faculty of Dentistry, Ankara University, with a chief complaint of spontaneous and persistent pain localized in the upper left anterior region. Clinical examination revealed tenderness to percussion in teeth #21 and #22, while no abnormal mobility was observed. Thermal tests were not performed due to the patient’s discomfort. Radiographic evaluation demonstrated a periapical radiolucency associated with tooth #21, indicative of a periapical

lesion, along with insufficient root canal filling and signs of root resorption, most likely of infectious origin (Figure 1).

Following local anesthesia, the old restorative material was removed using a diamond round bur, and an access cavity was carefully prepared. Rubber dam isolation was applied to ensure an aseptic working field. The previous root canal filling was removed using H-type files in conjunction with RT rotary instruments. Irrigation was performed after each file change with 2 mL of 5.25% sodium hypochlorite (NaOCl) and 17% ethylenediaminetetraacetic acid (EDTA) to aid in the dissolution of organic tissue and smear layer removal, respectively (Figure 2).

Once the canals were cleared of debris and remnants of the previous obturation, working length determination was performed using an electronic apex locator and confirmed radiographically (Figure 3). The root canals were then irrigated sequentially with 5.25% NaOCl, saline solution, and 2% chlorhexidine (CHX). Calcium hydroxide paste, prepared by mixing with saline, was placed as an intracanal medicament to aid in disinfection and control of periapical inflammation. The access cavity was sealed temporarily with suitable restorative material. The patient was informed about the possibility of a flare-up and was scheduled for a follow-up visit after 10 days.

At the subsequent appointment, the patient reported no symptoms. Upon removal of the temporary filling, the intracanal calcium hydroxide dressing was flushed out using H-type files, 2% NaOCl, and 17% EDTA. Final irrigation was performed in the following sequence: 2% NaOCl, 17% EDTA, a final rinse with 2 mL of 2% NaOCl, followed by saline and then 2% CHX. The canals were then dried with sterile paper points.

Due to the presence of apical root resorption, mineral trioxide aggregate (MTA) was selected as the final obturation material. The MTA was mixed according to the manufacturer's instructions and carefully placed into the canal using a hand plugger to ensure a homogeneous fill (Figure 4). A moist cotton pellet was placed in the pulp chamber, and access was sealed temporarily to allow the MTA to set.

The patient was recalled after 8 months for clinical and radiographic follow-up. At this visit, teeth #21 and #22 were asymptomatic, responded normally to percussion, and radiographic evaluation showed significant healing of the periapical tissues, with resolution of the lesion and no evidence of further root resorption (Figure 5). The treatment

was deemed successful, and periodic follow-up continues to monitor the long-term outcome.

3. Discussion

The management of teeth with failed root canal treatments remains a significant challenge in endodontics, requiring careful case selection and a well-informed treatment plan. When endodontic failure occurs, several therapeutic alternatives exist, including non-surgical orthograde retreatment, periradicular (apical) surgery, or extraction. Among these, non-surgical endodontic retreatment is often considered the treatment of choice, especially when adequate coronal and radicular access to the root canal system is possible. It is a conservative approach that preserves the natural dentition and has demonstrated higher long-term success rates compared to surgical methods such as apical resection with retrograde filling or root-end curettage (Stueland, 2023).

The goal of retreatment is to eliminate residual or recurrent intraradicular infection by removing the previous root canal filling materials, followed by thorough cleaning, shaping, and three-dimensional obturation of all accessible canals(Karaoğlan, 2022). The use of an inert and biocompatible material to seal the root canal space is essential to prevent further microbial leakage. A key factor influencing the outcome of both primary and secondary root canal treatment is the quality of the root canal obturation. Inadequate root fillings—characterized by underfilling, voids, or poor adaptation to the canal walls—can compromise the seal, leading to microleakage and subsequent bacterial contamination of the periapical tissues.

Several studies have highlighted the prevalence of poorly executed root canal fillings as a contributing factor to endodontic failure. In the current analysis, 28.5% of the evaluated cases demonstrated suboptimal obturation quality. This result is consistent with findings from previous studies. For instance, Barrieshi-Nusair et al (2004) reported 27.4% of root canals had poor-density fillings, while Dadresanfar et al (2021) observed a similar figure of 29.3% in their study. Such findings emphasize the importance of both technical proficiency and the use of modern techniques and materials in endodontic practice.

It is also important to consider that the variability in reported rates of inadequate root fillings across studies may stem from differences in evaluation criteria, radiographic

interpretation, and operator experience. Therefore, consistent training, use of magnification tools such as dental operating microscopes, and adherence to evidence-based protocols are essential for improving the quality of root canal therapy and minimizing the risk of retreatment.

In the present case, the decision to perform non-surgical retreatment was based on the feasibility of canal access, the presence of insufficient previous root canal obturation, and radiographic evidence of periapical pathology. The use of sodium hypochlorite, EDTA, and chlorhexidine during the disinfection phase, along with calcium hydroxide as an intracanal medicament, provided a comprehensive approach to eliminate microbial presence. The placement of MTA in the apical region due to root resorption further contributed to the favorable outcome observed at the 8-month follow-up. This case supports the notion that well-executed orthograde retreatment, even in complex cases involving resorption, can yield excellent clinical and radiographic outcomes.

4. Conclusion

In cases involving inadequate root canal treatment accompanied by periapical lesions, non-surgical endodontic retreatment remains the most appropriate and conservative treatment modality. Prior to initiating retreatment, it is essential to conduct a thorough assessment to identify the underlying cause of the initial treatment failure. Employing case-specific techniques for the effective removal of existing root canal filling materials, followed by meticulous cleaning, shaping, and obturation of the canal system with a biocompatible material, is fundamental to achieving long-term success. When performed according to established endodontic principles, orthograde retreatment can significantly improve the prognosis and preserve the natural dentition.

References

Barrieshi-Nusair, K. M., Al-Omari, M. A., & Al-Hiyasat, A. S. (2004). Radiographic technical quality of root canal treatment performed by dental students at the Dental Teaching Center in Jordan. *Journal of dentistry*, *32*(4), 301-307.

Brochado Martins, J. F., Guerreiro Viegas, O., Cristescu, R., Diogo, P., & Shemesh, H. (2023). Outcome of selective root canal retreatment-A retrospective study. *International Endodontic Journal*, *56*(3), 345-355.

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Dadresanfar, B., & Rotstein, I. (2021). Outcome of endodontic treatment: The most cited publications. *Journal of Endodontics*, *47*(12), 1865-1874.

Dioguardi, M., Stellacci, C., La Femina, L., Spirito, F., Sovereto, D., Laneve, E., ... & Troiano, G. (2022). Comparison of endodontic failures between nonsurgical retreatment and endodontic surgery: systematic review and meta-analysis with trial sequential analysis. *Medicina*, *58*(7), 894.

Hargreaves, K. M., & Cohen, S. (2010). *Cohen's pathways of the pulp*. Elsevier.

Karaoğlan, F., Miçooğulları Kurt, S., & Çalışkan, M. K. (2022). Outcome of single-versus two-visit root canal retreatment in teeth with periapical lesions: A randomized clinical trial. *International Endodontic Journal*, *55*(8), 833-843.

Sağlam, H. (2021). Non-surgical endodontic retreatment of anterior tooth with a large periapical lesion and extruded guta percha with 36 Months follow-up: a case report. *Open Journal of Stomatology*, *11*(4), 166-178.

Stueland, H., Ørstavik, D., & Handal, T. (2023). Treatment outcome of surgical and non-surgical endodontic retreatment of teeth with apical periodontitis. *International endodontic journal*, *56*(6), 686-696.

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Figure 1. Preoperative radiographic. (root resorption)

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Figure 2. Clinical appearance.

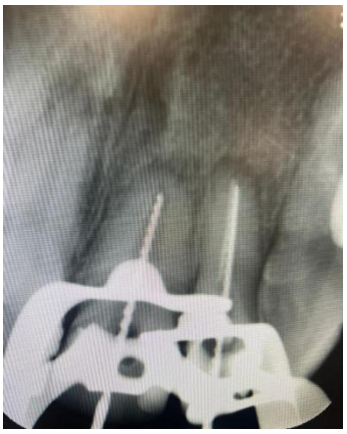

Figure 3. Radiographic appearance of canal length determination.

Figure 4. Postoperative radiographic after orthograde use of MTA.

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Figure 5. Postoperative radiographic view after eight months.

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