

Healing of periapical lesion by non-surgical endodontic therapy: A case report

Arunima.B¹, Deepak baby², Sreedevi³, Rajeev K G⁴, Ann mary Augustine⁵,
Reshma p babu⁶

¹(Dept. of Conservative Dentistry and Endodontics, /Kerala university of health sciences/PSM College of Dental Science and Research, Thrissur, Kerala, India)

²(Dept. of Conservative Dentistry and Endodontics, /Kerala university of health sciences/PSM College of Dental Science and Research, Thrissur, Kerala, India)

³(Dept. of Conservative Dentistry and Endodontics, /Kerala university of health sciences/PSM College of Dental Science and Research, Thrissur, Kerala, India)

⁴(Dept. of Conservative Dentistry and Endodontics, /Kerala university of health sciences/PSM College of Dental Science and Research, Thrissur, Kerala, India)

⁵(Dept. of Conservative Dentistry and Endodontics, /Kerala university of health sciences/PSM College of Dental Science and Research, Thrissur, Kerala, India)

⁶(Dept. of Conservative Dentistry and Endodontics, /Kerala university of health sciences/PSM College of Dental Science and Research, Thrissur, Kerala, India)

Abstract:

Periapical lesions often arise as a consequence of pulpal diseases, and most inflammatory periapical lesions are initially managed with conservative non-surgical methods. The success of root canal treatment hinges on the thorough cleaning, shaping, and obturation of the root canal system. Calcium hydroxide and triple antibiotic paste (TAP) are preferred intracanal medicaments due to their effective antibacterial properties. This case report details the non-surgical management of a periapical lesion associated with the mandibular central incisors in a 18-year-old female who presented with periodic swelling and pus drainage in the labial sulcus, due to traumatic accident in the that area. The case underscores the effectiveness of using calcium hydroxide and TAP as interappointment endodontic dressings, leading to favorable clinical and radiographic outcomes for managing a periapical radiolucency.

Key Word: periapical lesion, triple antibiotic paste, calicum hydroxide, non surgical treatment.

Date of Submission: 24-08-2024

Date of Acceptance: 03-09-2024

I. Introduction

Pulpal infections can arise from various factors, including dental caries or trauma, leading to tissue necrosis. Periapical infection is an inflammatory condition affecting the periradicular tissues surrounding the teeth, resulting from the complex interaction between endodontic pathogens and the host's defense mechanisms.¹ This process can cause bone resorption and damage to the periradicular tissues. Although these lesions serve as a defense against microbial infection, they do not heal on their own without appropriate intervention.²

Treatment options for managing large periapical lesions include non-surgical endodontic therapy, which may be complemented by endodontic surgery, or, in some cases, tooth extraction. Successful management often hinges on effective microbial elimination or reduction within the pulp system, achieved through thorough chemo-mechanical preparation.³ This approach aims to address the infection and promote healing, thereby increasing the likelihood of a favorable outcome.

This article presents a case report on the non- surgical management of a periapical lesion combined with Ca(OH)₂ and TAP as intracanal medicaments.

hinges on effective microbial elimination or reduction within the pulp system, achieved through thorough chemo-mechanical preparation.³ This approach aims to address the infection and promote healing, thereby increasing the likelihood of a favorable outcome.

This article presents a case report on the non- surgical management of a periapical lesion combined with Ca(OH)₂ and TAP as intracanal medicaments.

II. Case Report

A 18 year old female patient came to the department of endodontics with chief complaint of swelling and pain in relation to lower front teeth for 4 months. She had a history of trauma 5 years back. Clinically, the lower mandibular incisors with sinus and tenderness on percussion. The vitality test was negative. Radiographically, a radiolucency was noted in relation to the apical region of 31 and 41.

Under local anaesthesia and rubber dam isolation, access cavity was prepared on 31 and 41. Working length was determined - 22mm and 22.5mm for 31 and 41, respectively. Cleaning and shaping was done upto and F2 rotary file (ProTaper gold) on 31 and 41, with intermittent irrigation using 3% sodium hypochlorite solution. After final rinsing with normal saline, the canals were dried with paper point and packed with calcium hydroxide. The patient was recalled after one week. The previous intracanal medicament was removed. The canals were flooded with 3% sodium hypochlorite and final rinsing with normal saline was done. The dried canals were packed with triple antibiotic paste and temporary restoration was given. In the third appointment, which was scheduled after 3 week, the intracanal dressing was replaced with calcium hydroxide. After one week, the patient was recalled. The root canals were filled with normal saline. Then, obturation was done using F3 guttapercha points for 31 and 41, respectively. Post endodontic restoration was done with composite. Follow up radiograph taken after 3 months shows reduction in periapical radiolucency.

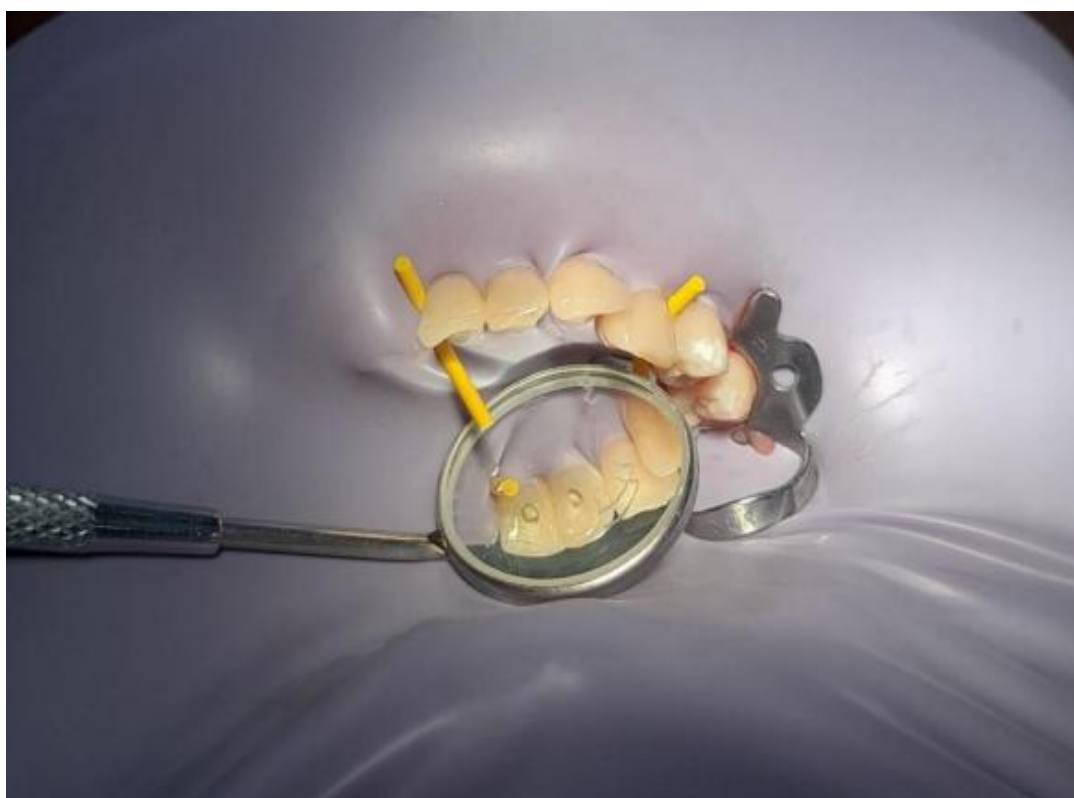


FIGURE 1 RUBBER DAM ISOLATION AND ACCESS OPENING OF 31 AND 41

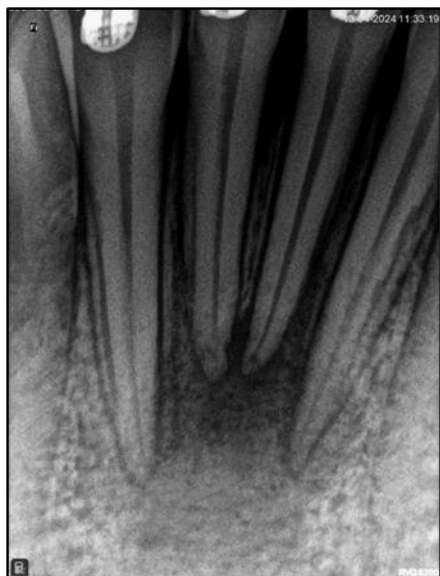


FIGURE 2 PREOPERATIVE RADIOGRAPH

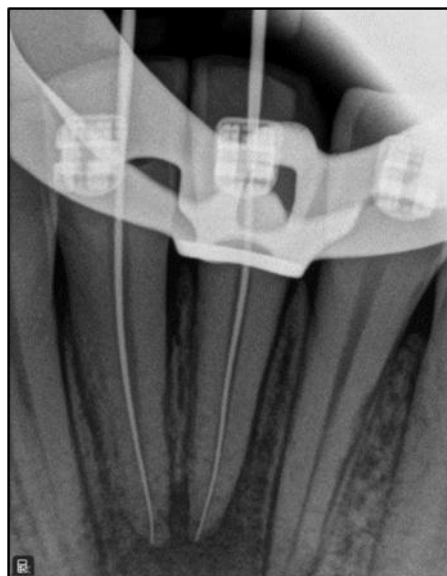


FIGURE 3 WORKING LENGTH

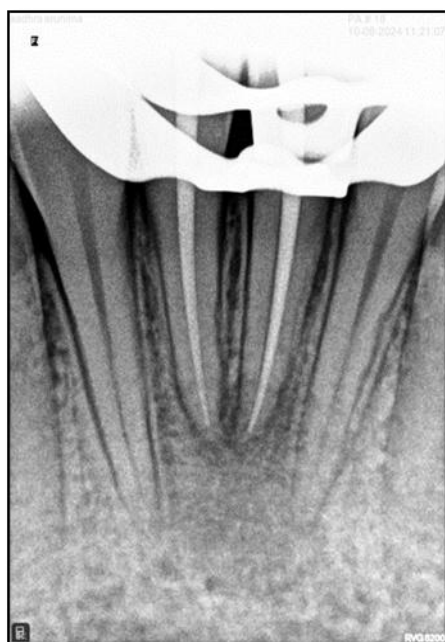


FIGURE 4 MASTER CONE

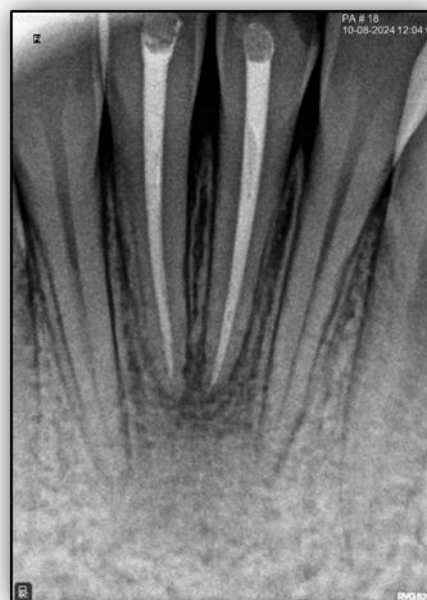


FIGURE 5 FOLLOW UP

III. Discussion

The ultimate success of non-surgical endodontic therapy hinges on the cleaning and shaping of the root canal and microbial eradication.⁴ Aseptic conditions were ensured through rubber dam isolation and the use of sterile instruments. To aid in debris removal, intermittent flushing with 3% sodium hypochlorite and sterile normal saline was employed. Recapitulation between each instrument was crucial for preventing apical region clogging and maintaining root canal patency.

In the initial appointment, calcium hydroxide was used as the intracanal medicament, but when symptoms persisted, triple antibiotic paste (TAP) was applied in the subsequent visit. By the third visit, the intracanal medicament was again switched to calcium hydroxide. TAP has proven to be an effective combination of drugs for root canal disinfection, sterilization, and in protocols for pulp regeneration and revascularization.

Bhaskar et al proposed that calcium hydroxide exerts a fourfold effect beyond the apex by acting as an anti-inflammatory agent, neutralizing acidic byproducts, stimulating alkaline phosphatase activity, and providing antibacterial action, while also absorbing carbon dioxide, which many root canal pathogens rely on for metabolic activities. Although calcium hydroxide was initially used in this case, it did not fully alleviate the symptoms.⁵ Given that calcium hydroxide is gradually resorbed by periapical fluids, it necessitates regular renewal of the canal dressing to mitigate the periapical inflammatory response. As a result, the treatment protocol was modified, and triple antibiotic paste (TAP) was implemented, which has demonstrated efficacy in eradicating bacteria from infected dental tissues.⁶

Metronidazole is effective against a broad range of anaerobic bacteria, while ciprofloxacin and minocycline address strains resistant to metronidazole. One drawback of triple antibiotic paste (TAP) is tooth discoloration caused by minocycline, TAP was applied below the cemento-enamel junction (CEJ) in this case.⁸

Non-surgical management of periapical lesions is generally preferred over surgical methods due to its ability to avoid potential damage to adjacent vital teeth, nearby anatomical structures, and the discomfort associated with surgery.⁷ Factors such as patient acceptance, apprehension towards surgical procedures, age, and medical conditions that limit surgical options also support the use of non-surgical approaches. Surgical intervention should be reserved for cases where conventional root canal treatments have proven ineffective.⁹

IV .Conclusion

A periapical lesion can often be conservatively managed through non-surgical endodontic therapy by effectively combining proper instrumentation, irrigation, their activation, intracanal medicaments, and obturation. However, in cases where the lesion does not resolve with non-surgical methods, a surgical approach should be considered as a secondary option.

V. References

- [1]. Nair PN. Pathogenesis of apical periodontitis and the causes of endodontic failures. *Crit Rev Oral Biol Med* 2004;15:348-81.
- [2]. Natkin E, Oswald RJ, Carnes LI. The relationship of lesion size to diagnosis, incidence, and treatment of periapical cysts and granulomas. *Oral Surg Oral Med Oral Pathol* 1984;57:82-94.
- [3]. Fernandes M, de Ataíde I. Nonsurgical management of periapical lesions. *J Conserv Dent* 2010;13:240-5.
- [4]. Lalonde ER, Luebke RG. The frequency and distribution of periapical cysts and granulomas. An evaluation of 800 specimens. *Oral Surg Oral Med Oral Pathol* 1968;25:861-8. .
- [5]. Natkin E, Oswald RJ, Carnes LI. The relationship of lesion size to diagnosis, incidence, and treatment of periapical cysts and granulomas. *Oral Surg Oral Med Oral Pathol*. 1984;57(1):82-94.
- [6]. Lalonde ER. A new rationale for the management of periapical granulomas and cysts: an evaluation of histopathological and radiographic findings. *J Am Dent Assoc*. 1970;80(5):1056-9.
- [7]. Plotino G, Pameijer CH, Grande NM, Somma F. Ultrasonics in endodontics: a review of the literature. *J Endod*. 2007;33(2):81-95.
- [8]. Parhizkar A, Nojehdehian H, Asgary S. Triple antibiotic paste: momentous roles and applications in endodontics: a review. *Restor Dent Endod*. 2018;43(3):e28. doi:10.5395/rde.2018.43.e28.
- [9]. Ayodhi S, Leburu A, Krishnamurthy M, Kumar N. Non- surgical management of a large periapical cyst like lesion using metapex, a three year followup - A case report. *IP Indian J Conserv Endod* . 2023;7(4):186-9.