

Periapical healing by non-surgical intervention : A case report

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Abstract:

The rationale behind endodontics is to thoroughly disinfect the root canal system, and to provide hermetic seal which in turn ceases the progress of the periapical infection. Most of these periapical infections attributed directly or indirectly to oral microbes. Surgical interventions in larger periapical infection are sometimes accompanied by certain complications. Hence, non-surgical approach can be considered. This article presents non-surgical healing of a periapical lesion of endodontic origin associated with maxillary left central and lateral incisors, observed over a period of 6 months, using calcium hydroxide as an intracanal medicament.

Keywords: Calcium hydroxide, Non-surgical, Periapical healing, Root canal treatment.

Introduction

Necrosed pulp, within root canal system are highly susceptible to colonization by the oral microbes. These microbes along with other cell components may trigger an inflammatory process in periapical tissues. Subsequently, immunopathological process lead to periapical infections.¹ These infections are generally diagnosed either during routine dental radiographic examination or following severe toothache. And as a conservative approach, all periapical infections should be initially treated with non-surgical means.² Even some authors have reported of up to 85% treatment success for periapical infection after endodontic therapy alone.³ This therapy can clear the periapical infections of root canal systems in the most efficient way.⁴

Calcium hydroxide is widely used as an intracanal medicament because of its various biological properties such as antimicrobial activity, tissue dissolving ability and induction of repair by hard tissue formation. Most of its antimicrobial activity is attributed to the release of hydroxyl ion, which comes from the dissociation of calcium hydroxide into calcium and hydroxyl ion in aqueous solution, and even provides a high alkaline environment with PH value of 12, where most of the

microorganisms are unable to survive.^{5,6,7,8} This case report describes the non-surgical management of a periapical infection by using calcium hydroxide as an intracanal medicament.

Case report

A 16 year old female patient reported to the clinic with persistent mild pain and intermittent swelling in the left maxillary anterior tooth region. The patient gave a history of trauma to her anterior teeth 15 months back. Intraoral examination revealed that teeth 21 and 22 were tender on percussion. Both teeth failed to respond to thermal and electric pulp testing; the adjacent teeth responded within normal limits. Normal gingiva health was confirmed on periodontal probing.

Intraoral periapical radiograph revealed moderate size (20×17mm diameter) periapical lesion with ill-defined borders involving the apices of teeth 21 and 22 (Fig. 1). Non-surgical endodontic therapy was planned. Following access cavity preparation, pus discharge was seen. After drainage was ceased, working length determined. Shaping and cleaning was done using K-Files by step-back technique. The canals were then thoroughly irrigated with warm saline and 2.5% sodium hypochlorite. The canals instrumentation was carried out using RC-Prep. After biomechanical preparation of canals to an apical size of ISO #60, calcium hydroxide paste was dispensed into the canals using lentulospirals. Access cavities of both 21 and 22 were sealed with cavit (Fig. 2 & Fig. 3). A week later, patient was asymptomatic and received a fresh dressing of calcium hydroxide, following irrigation and drying of the canals. The same procedure was repeated again after 2 weeks and after 4 weeks.

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The patient missed her scheduled appointment and reported back only after 5 months. However, the patient was asymptomatic and periapical radiograph revealed a significant resolution of the lesion with considerable bone formation. In the same visit, canals were cleaned and dried. Master cone selection was done corresponding to ISO #60 size (Fig. 4). Both canals were obturated by lateral condensation technique using AH-Plus root canal sealer (Fig. 5).



Fig. 1: Preoperative radiograph showing periapical lesion in relation to 21, 22



Fig. 2: Working length radiograph in relation to 21



Fig. 3: Working length radiograph in relation to 22

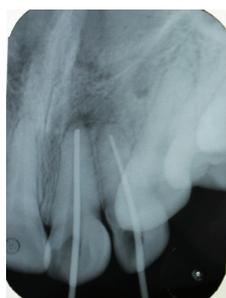


Fig. 4: Master cone radiograph (After 5 months of intracanal medication)

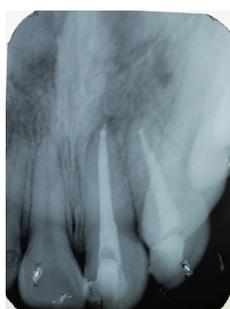


Fig. 5: Postobturation radiograph with postendodontic

Discussion

Regardless of any histological diagnosis of teeth with periapical radiolucencies, initial treatment options remain same for all i.e. conventional root canal treatment,¹ which is primarily aimed at reducing the microorganisms load within the root canal systems to the minimum as possible.

Though there is lack of comparative studies between surgical and non-surgical root canal treatment, in one of the systematic review by Torabinejad et al, surgical and non-surgical retreatment techniques were compared over a period of time, which showed a significantly higher success rate for endodontic surgery at 2-4 years; and for non-surgical procedure at 4-6 years.⁹

Non-surgical resolution of any periapical lesions depends on the thorough neutralization of infection from the root canal. Shaping and cleaning of the root canals aided with 2.5% sodium hypochlorite along with calcium hydroxide as intracanal medicament is recommended to achieve the above purpose.^{10,11,12} In the present case report calcium hydroxide was used as the intracanal medicament. Caliskan and Sen have demonstrated that the treatment with calcium hydroxide resulted in significant amount of periapical healing with complete resolution of the periapical defect by osseous regeneration.¹⁰ Calcium hydroxide is well known as the most successful intracanal medicament for teeth with periapical lesions, with actions like anti-inflammatory, acid-neutralizing, cellular differentiation inducing and exotoxins neutralizing. All these actions ultimately lead to the periapical healing.³

The efficacy of calcium hydroxide root canal dressing is directly depends on the sustained release of calcium and hydroxyl ions to the root canals as well as periapical regions. Since these ions are continuously resorbed by periapical fluids, regular renewal of the dressing is required to enhance the periapical healing process.¹ Hence in the present case report calcium hydroxide dressing was renewed on weekly basis.

Conclusion

1. The case report demonstrated that the excellent periapical healing of large lesion is possible through non-surgical approach, provided a thorough debridement, disinfection and three dimensional obturation of root canal system is carried out.
2. Calcium hydroxide as an intracanal medicament helps in periapical lesion's healing effectively.
3. Before moving for invasive treatment like surgery for large periapical lesion, it would be advisable if non-surgical approach is attempted.

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