Scholars Journal of Dental Sciences
Abbreviated Key Title: Sch J Dent Sci
ISSN 2394-4951 (Print) | ISSN 2394-496X (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Calcium Hydroxide Induced Periapical Healing of Lower Anterior Teeth with Periapical Lesion Following a Dental Trauma - 4 Year Follow Up

Dr. Walid Sultan[1], Dr. Krithika A. Chakravarthy[2*]

[1]BDS, FDSRCS Edin, Specialist Restorative Dentist, PHCC, Qatar
[2]MDS, Specialist, Restorative Dentist, PHCC, Qatar

DOI: 10.36347/sjds.2023.v10i03.002 | **Received:** 09.02.2023 | **Accepted:** 16.03.2023 | **Published:** 19.03.2023

***Corresponding author**: Dr. Krithika A. Chakravarthy
MDS, Specialist, Restorative Dentist, PHCC, Qatar

Abstract | **Case Report**

Calcium hydroxide is an intracanal medicament used in clinical dentistry since the time it was introduced by Herman in 1920. It is considered as a gold standard material for its varied uses in Endodontics. Calcium hydroxide has set a standard in the field of endodontic research over which other materials are evaluated even today. This case report highlights the calcium hydroxide intracanal medicament induced healing of a periapical lesion in lower central incisor following a chronic dental trauma.

Keywords: Periapical lesion, Calcium hydroxide intracanal medicament, Dental trauma.

INTRODUCTION

Dental trauma is one of the most common causes of non-vitality of teeth. The primary etiology of periapical lesion is the microbial infection following a nonvital tooth. Microbes [1] cause apical inflammatory changes leading to resorption of bone or tooth or both. The aim of endodontic treatment is to eliminate the microbial flora and create a suitable environment for healing to take place. This case report highlights the effect of calcium hydroxide medicament in the healing of the periapical lesion following dental trauma.

CASE REPORT

A 24-Year-old, healthy male patient reported to the Dental clinic complaining of pain and swelling in the lower anterior region since 2 days. He reported that the swelling started a day before with on and off pain since few months. He also complained of the associated discolored teeth.

On reviewing the history, he noted a previous trauma to the tooth many years back and discoloration following the trauma. Extraoral examination revealed no facial asymmetry with normal mouth opening and no abnormality in lymph nodes. Intraoral examination revealed periapical swelling in relation to 41 with discolored crown, chipped incisal enamel with grade 1 mobility. Pulp sensibility tests showed no response in 41 with normal response in 42, 31. Periodontal examination showed no deep sulcus or periodontal pocket with moderate oral hygiene. Redness of the attached gingiva was noted around the apical area of 41. Intraoral periapical Radiograph (Figure 1, 2) showed the presence of Raiolucency around 41 measuring around 10 x 8 cm.

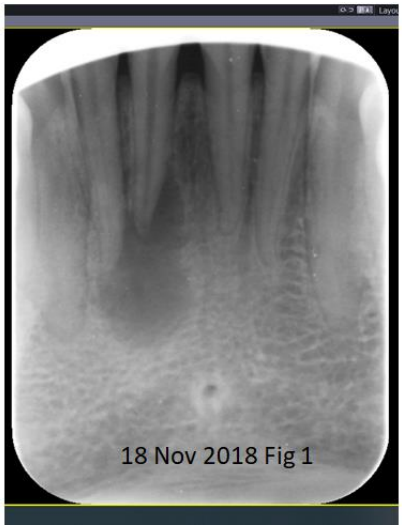

Figure 1: Preoperative Radiograph

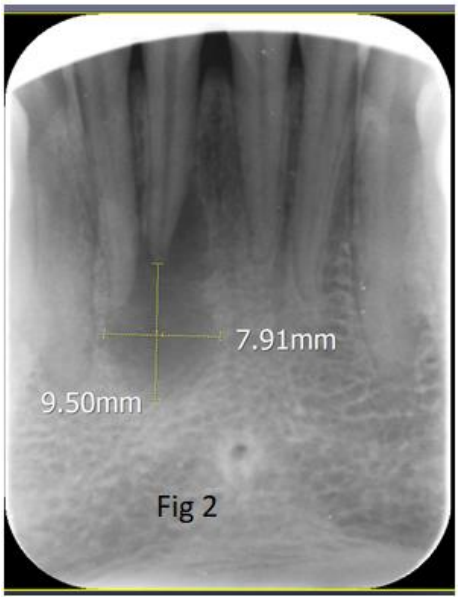

Figure 2: Preoperative radiograph with Measurement of lesion size

Access opening was done without local anesthesia to relieve pain. Pus was drained through the orifice. Initial cleaning and shaping done and canal were filled with non-setting calcium hydroxide Intracanal medicament (Ultracal). 2 weeks review showed an obvious resolution of the periapical swelling with pink attached gingiva over the apical areas of 41. Complete chemo mechanical preparation was done with Protaper Universal rotary system with continuous copious irrigation with 2% sodium hypochlorite and saline. There was no frank drainage from the canal but the canal was not clinically dry and again calcium hydroxide intracanal medicament was placed. Obturation was done after 1 month of initial access preparation with Gutta percha and AH plus sealer by cold lateral condensation (Figure 3).

Figure 3: Post obturation Radiograph

Review was done after 1 and 3 months with favorable Radiographic and clinical healing. Tooth 42 and 31 showed positive results, tooth stable in the dental arch with no mobility and are kept under observation. Review was done after an year and radiograph (Figure 4) and pulp sensibility tests were repeated. One year follow up showed complete healing of the periapical lesion. Patient was advised to follow up after 3 and 5 years and advised crown for the discolored and fractured 41. Patient reported after 4 years to our clinic. Clinical and Radiographic examination (Figure 5) showed complete resolution of lesion. Four years follow up showed a clinical and radiographic favorable prognosis with adequate functional success from patients point.

Figure 4: One year follow up

Figure 5: Four year follow up

DISCUSSION

Management of traumatic dental injuries is highly subjective and is very specific to the presenting symptom. Timely management of dental pulp is

important in the management of traumatic dental injuries. In this case, patient reported to dental clinic many years after the dental trauma with a discolored tooth and periapical lesion.

Even though there was only an enamel fracture with a comparatively intact dentine clinically, the teeth showed discoloration and periapical inflammation suggesting a bacterial infection of the pulp and associated periodontal tissues. The bacteria could reach the pulp through the exposed dentinal surfaces or through microscopic crack lines. Once pulpal infection is established, external root resorption occurs due to the spread of bacteria and its toxins from the root to the PDL.

Grey or brownish color change of the tooth suggested a nonvital tooth [2]. The color change is correlated to the hemorrhage inside the pulp space [3]. External resorption [4, 5] could have been prevented if the patient had had an endodontic treatment initiated within 2 weeks of a recent trauma. In this case, patient reported to us with an established periapical lesion suggesting an external resorption.

Discoloration, clinical periapical abscess and radiographic periapical lesion suggested a diagnosis of Pulp necrosis with apical periodontitis. Thus our treatment started with drainage of pus and Calcium hydroxide medicament for the healing of the periapical lesion. As expected, performing an aseptic chemo mechanical preparation with Rotary system and 2% Sodium hypochlorite and calcium hydroxide medicament and with a good immune status aided in the healing of the External resorption in a year.

The antimicrobial effect of calcium hydroxide medicament [6-8] is related to the hydroxyl ions released in an aqueous environment, which affects cytoplasmic membranes, proteins, and the DNA of microorganisms. In addition to this effect, calcium hydroxide has many other effects which add in ultimate healing of bone lesion.

Regular recalls are a vital source of learning in clinical endodontics. Four year follow up of this case has emphasized the success of calcium hydroxide as an intracanal medicament.

This case report highlights that calcium hydroxide intracanal medicament is a time-tested material. Even though many newer materials are introduced in the management of periapical lesion like MTA and Bio ceramics, Calcium hydroxide acts as a safe, cheap, time-tested material with its excellent healing and bone inducing abilities. Also, this case emphasizes the need for a follow up to confirm the long-term success.

REFERENCES

1. José, F., Siqueira Jr., & Isabela, N. (2009). Rôças Distinctive features of the microbiota associated with different forms of apical periodontitis. *J Oral Microbiol.*, 1. doi: 10.3402/jom.v1i0.2009
2. Malmgren, B., & Hubel, S. (2012). Transient discoloration of the coronal fragment in intra alveolar root fractures. *Dental traumatology*, 28 200-4.
3. Andreason, F. M. (1986). Transient apical breakdown and its relation to color and sensibility changes after luxation injuries to teeth. *Endodontics and Dental traumatology*, 2. 9-19.
4. Trope, M. (2002). Root resorption due to Dental trauma. *Endodontic topics*, 1, 79-100.
5. Krastl, G., Weiger, R., Filippi, A., Van Waes, H., Ebeleseder, K., Ree, M., Connert, T., Widbiller, M., Tjäderhane, L., Dummer, P. M. H., & Galler, K. (2021). Endodontic management of traumatized permanent teeth: a comprehensive review. *Int Endod J.*, 54(8),1221-1245.Epub 2021 Mar 31.
6. Kim, D., & Kim, E. (2014). Antimicrobial effect of calcium hydroxide as an intracanal medicament in root canal treatment: a literature review-Part I. In vitro studies. *Restorative Dentistry & Endodontics*, *39*(4), 241-252. ISSN 2234-7658 (print) / ISSN 2234-7666 (online) http://dx.doi.org/10.5395/rde.2014.39.4.241 Dohyun Kim, Euiseong Kim.
7. Foreman, P. C., & Barnes, I. E. (1990). Review of calcium hydroxide. *Int Endod J.*, 23, 283-297.
8. Farhad, A., & Mohammadi, Z. (2005). CALCIUM HYDROXIDE: A REVIEW. *Int Dent J.*, 55, 293-3-1.