

An Unusual Sequel to Calcium Hydroxide Extrusion- A Case Report

¹Dr M. Madhavi Krishna, Assistant professor, Department of Pedodontics and Preventive Dentistry, Anil Neerukonda institute of dental sciences, Visakhapatnam

²Dr P. Jayalakshmi, Associate Professor, Department of Pedodontics and Preventive Dentistry, GITAM Dental College and Hospital, Visakhapatnam

³Dr B S Nikitha, Assistant Professor, Department of Pedodontics and Preventive Dentistry, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam

⁴Dr. Chaitanya Ram Kandregula, Associate Professor, Department of Pedodontics and Preventive Dentistry, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam

Corresponding Author: Dr M. Madhavi Krishna, Assistant professor, Department of Pedodontics and Preventive Dentistry, Anil Neerukonda institute of dental sciences, Visakhapatnam

Citation of this Article: Dr M. Madhavi Krishna, Dr P. Jayalakshmi, Dr B S Nikitha, Dr. Chaitanya Ram Kandregula, “An Unusual Sequel to Calcium Hydroxide Extrusion- A Case Report”, IJDSIR- October - 2020, Vol. – 3, Issue - 5, P. No. 180 – 184.

Copyright: © 2020, Dr M. Madhavi Krishna, et al. This is an open access journal and article distributed under the terms of the creative commons attribution noncommercial License. Which allows others to remix, tweak, and build upon the work non commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Calcium hydroxide [Ca(OH)₂] has been widely used as short- or long-term intracanal inter appointment antibacterial dressing material as it is associated with Peri radicular healing.

In this case report of 13 year old, a prepared paste of calcium hydroxide and saline was introduced and was working well but accidentally the extruded material through the orifice showed a deleterious effect on the soft tissue. Following a careful protocol after the accident the child showed satisfactory healing.

Keywords: Calcium Hydroxide paste, Periapical Lesion, Accidental Extrusion, Extraoral Swelling.

Introduction

Ca(OH)₂ is a formless, thin, granular powder with strong alkaline properties is proven gold standard material since its inception in 1921 by Hermann. It can dissolve only slightly in water and is insoluble in alcohol. Its usage in endodontics initially was confined as a mixture of Ca(OH)₂ with any of the vehicles (aqueous,viscous) as it lacks radiopacity and is not easily seen radiographically. Later it was used for different treatment avenues. As an intracanal medicament it has been associated with periradicular healing, and the routine use of Ca(OH)₂ as an inter appointment intracanal medicament became widespread [1].

Its anti-inflammatory activity, neutralization of acid products, activation of alkaline phosphatase, antibacterial action [2] and its allowing the connective tissue invagination into lesion [3] led $\text{Ca}(\text{OH})_2$ to be deliberately placed beyond the apical foramen into the periradicular lesions thus becoming an immediate choice of material where the other dental materials have failed.

The literature supports that calcium hydroxide even after extrusion into the periradicular area would resorb without any untoward effects [4,5]. Case reports have been published suggesting non resorbability and delayed healing [6].

Contrary to the normal belief the present case reports an unusual and rare consequence of an accidental extrusion of calcium hydroxide through coronal orifice of maxillary left central incisor which lead to a swelling in the upper mucosa and the lip.

Case Report

A 13 year old female patient reported to the Department of Paediatric and Preventive Dentistry, Anil Neerukonda Institute of Dental Sciences, Visakhapatnam, Andhra Pradesh, with a chief complaint of pain in maxillary central incisor. A relevant history of trauma to the maxillary anterior region two years back and a recent blow on the anterior region during play was reported. On electric pulp testing the concerned tooth gave true negative response indicating non vitality.

The radiographic examination revealed a diffused radiolucency in relation to maxillary left central incisor (fig 1). A diagnosis of a phoenix abscess due to pulpal necrosis as a sequel to trauma was arrived at. The patient was kept on antibiotics and analgesics and was reviewed after three days for endodontic treatment.

Under local anesthesia (Lignox2%), endodontic treatment was initiated. On access opening, there was purulent pus discharge along with blood into the pulp chamber. The root canal was cleaned and shaped with K-Files (Mani,Prime Dental)using step back technique upto 40K file. The canals were irrigated with 5ml saline. The discharge eventually stopped after through biomechanical preparation. An inter-appointment dressing with $\text{Ca}(\text{OH})_2$ powder (Vishal Dentocare Pvt. Ltd, Ahmedabad, Gujarat) mixed with saline was placed and was given a closed dressing. Patient was recalled after three days for further treatment. However, the patient reported on the very next day with a complain of swollen lip on the treated side.(fig 2) The detailed history revealed the onset of the swelling started immediately after reaching home and it increased gradually to the present size. Intraoral examination revealed slight sloughing, desquamation of the labial mucosa in relation to the treated side of the lip with totally no pain. (fig 3)

Treatment

The early detection by the patient and immediate implementation of the following therapeutic measures has ensured the rapid cure and possible prevention of further mucosal damage. The measures taken were Permanent removal of causative agent in the root canal.

Copious irrigation with normal saline in the root canal and on the site of swelling and discharging the patient with an open dressing.

Topical application of benzocaine.

Nutritional supplements in the form of Multivitamins that improved the healing.

Advised the patient to be on soft and cold diet without spice for a week.

Recalled after 48 hrs, for further treatment.

The swelling subsided satisfactorily and root canal treatment was carried out followed by crown.(fig 4)

Discussion

Calcium hydroxide ($\text{Ca}(\text{OH})_2$) has a wide array of usage in the field of Endodontics as a liner after cavity preparation, indirect and direct pulp capping, as an intra canal dressing during root canals, prevention of root resorption, repair of iatrogenic perforations, treatment of horizontal root fractures, and as a constituent of root canal sealers.[4]

Its extensive use is because of its properties such as initiation and stimulation of mineralization, the antibacterial characteristics, and the dissolution of necrotic material.[5]

In some cases $\text{Ca}(\text{OH})_2$ dressing material is consciously placed beyond apical foramen for its beneficial action on periradicular tissues.[6]

Such deliberate overextension may not be favorable in some cases, since periradicular extrusion of $\text{Ca}(\text{OH})_2$ can have damaging effects.[7] neurotoxic effects of root canal sealers [8], cytotoxicity on cell culture [9], damaged epithelium with or without cellular atypia when applied on hamster cheek pouches [10], cellular damage following early $\text{Ca}(\text{OH})_2$ dressing of avulsed teeth [11] and necrosis of buccal gingiva and mucosa after periradicular overextension due to alkaline burn [12].

Some of the materials affecting soft tissue are:

Aspirin: It causes localized white scurf with a reddened and thickened border. Calcium hydroxide: Patients present with a swollen lip and mucosa, no history of pain and an extensive necrotic zone on gingiva with perforation [13]. This holds up with the present case

where it shows the presence of swollen lips with slight desquamation of the tissue with no pain.

Eugenol burns: It usually presents with burning sensation and pain over the exposed area. Patient also complains of itching sensation. Intraoral examination may reveal allergic reaction “contact stomatitis” over the gingiva and adjacent mucosa.[14]

Clinical presentation of the chemical injuries might differ according to the composition and concentration, pH of the substance, the quantity applied, the manner and duration of tissue contact, and the extent of penetration into tissue. These oral mucosal changes can vary from diffuse erosive lesions ranging from simple mucosal sloughing to complete mucosal detachment with extension into the submucosa. [15]

In the present case, as the quantity and time of tissue contact is less, the erosive changes were confined to superficial sloughing with white to yellow lesion. Hence it may be a case of chemical burn on the lips caused by $\text{Ca}(\text{OH})_2$.

Conclusion

Clinical diagnosis may be a diagnostic challenge; therefore, a detailed history and review of a patient’s medical condition and ruling out the causative agent will help to differentiate the possible reason of the presenting lesion. The management primarily requires identification and elimination of the agent responsible followed by symptomatic treatment and prevents recurrence.

References

1. Hasan Orucoglu, Funda Kont Cobankara. Effect of Unintentionally Extruded calcium hydroxide paste including barium sulfate as a radiopaquing agent in treatment of teeth with periapical lesions: Report of a case. *J Endod* 2008;34:888-891
2. Souza V, Bernabe PFE, Holland R, Nery MJ, Mello W, Otoboni Filho JA. Tratamento nao cirurgico de dentes com lesoes periapicais. *Rev Bras Odontol* 1989; 46:39-46.
3. Sahli C. L. Hydroxide de calcium dans le traitement endodontique des grandes lesions periapicales. *Rev Fr Endod* 1988; 7: 45-51.
4. Foreman PC, Barnes IE. A review of calcium Hydroxide. *Int Endod J* 1990; 23: 289-97.
5. Orstavik D, Kerekes K, Molven O. Effects of extensive apical reaming and calcium hydroxide dressing on bacterial infection during treatment of apical periodontitis: a pilot study. *Int Endod J* 1991;24:1-7.
6. Sharma DS, Chauhan SS, Kulkarni VK, Bhusari C, Verma R. Accidental periapical extrusion of non-setting calcium hydroxide: Unusual bone response and management. *J Indian Soc Pedod Prev Dent* 2014;32:63-7
7. Tronstad L, Andreasen JO, Hasselgren G, Kristerson L, Riis I. pH changes in dental tissue after root canal filling with calcium hydroxide, *J Endod* 1981; 7: 17-21.
8. Boiesen J, Brodin P. Neurotoxic effect of two root canal sealers with calcium hydroxide on rat phrenic nerve in vitro. *Endod Dent Traumatol* 1991; 7: 242-5.
9. Alacam T, Omurlu H, Ozkul A, Gorgul G, Misirligil A. Cytotoxicity versus antibacterial activity of some antiseptics in vitro. *J Nihon Univ Sch Dent* 1993; 35:22-7.
10. Dunham LJ, Muir CS, Hamner JE. Epithelial atypia in hamster cheek pouches treated repeatedly with calcium hydroxide. *Br J Cancer* 1966; 20: 588-93.
11. Andreasen JO, Kristerson L. The effect of extraalveolar root filling with calcium hydroxide on periodontal healing after replantation of permanent incisors in monkeys. *J Endod* 1981; 7: 349-54.
12. De Bruyne MA, De Moor R, Raes FM. Necrosis of the gingiva caused by calcium hydroxide: a case report. *Int Endod J* 2000; 33: 67-71.
13. Dayakar MM, Pai PG, Sooranagi RP, Vijayan V, Waheed A. Chemical burns of gingiva and its management. *SRM J Res Dent Sci* 2018;9:174-80.
14. Deshpande A, Verma S, Macwan C. Allergic reactions associated with the use of eugenol containing dental cements in a young child. *Austin J Dent* 2014;1:1007.
15. Dayakar MM, Pai PG, Madhavan SS. "Tetracycline hydrochloride chemical burn" as self-inflicted mucogingival injury: A rare case report. *J Indian Soc Periodontol* 2012;16:282-5.

Legend Figure



Fig 1: IOPA showing diffused radiolucency i.r.t maxillary left central incisor



Fig 2: Extraoral photograph showing swollen on the left side of the upper lip



Fig 3: Slight sloughing, Desquamation of the labial mucosa in relation to the treated side of the lip



Fig 4: Post treatment photograph showing crown after the completion of root canal. Complete resolution of swelling can also be seen.