

NON SURGICAL MANAGEMENT OF GRADE 3
MOBILE TEETH: A CASE REPORT

ABSTRACT

The main goal of endodontic therapy is to eliminate or at least achieve a significant reduction of microorganisms present in the root canal system. It is well recognized that chemo-mechanical instrumentation alone is unable to completely disinfect the root canal system. Use of intracanal medication with antimicrobial activity between appointments has been recommended to eliminate possible persistent microorganisms. Calcium hydroxide with its antimicrobial property has been widely used as inter appointment intracanal dressing. This paper presents a case report in which Calcium hydroxide was used as an intracanal medicament for treatment of mobile teeth with periapical abscess.

Keywords: mobility, calcium hydroxide, pedodontics

Date of Submission : 4/2/16

Date of Acceptance : 12/21/16

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INTRODUCTION

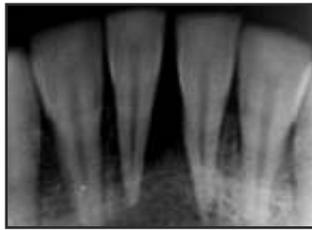
Dentoalveolar abscesses are infections of dental origin, the majority with an endodontic or a periodontal pocket origin. Periapical and periodontal abscesses may advance into combined periodontal endodontic lesions. Dental abscesses and abscesses in general expand through tissue providing least resistance by forming a sinus tract (fistula). In case of the periodontal abscess, drainage is most likely to take place through the periodontal pocket since this is usually the path of least resistance. In case of a periapical abscess, the spread is primarily dictated by the thickness of the overlying bone and the location of the abscess in

relation to muscle attachments. In the maxilla, periapical abscesses drain through the palatal bone into the oral cavity or rarely into sinus maxillaris or the nasal cavity. The mandibular periapical abscess drains commonly through the buccal bone into the oral cavity.¹

Pathology of the periapical abscess

— The pathological features of the periapical abscess depend on the microbial activity occurring in the apical part of the root canal, having little room for expansion except through the apical foramen.

— The necrotic pulp of the root canal serves as an important source of bacterial nutrition.^{2,3}

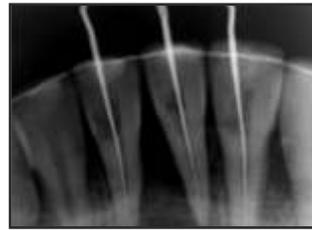


Pre operative radiograph

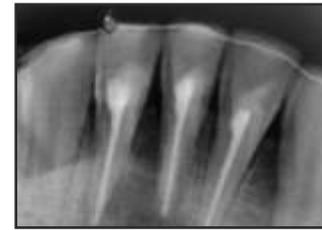


Pre operative photograph

Figure 1



Working length was determined



Calcium hydroxide dressing

Figure 2



Obturation radiograph

Figure 3



1 year follow up radiograph and photograph

Figure 4



Proteolytic bacteria predominate the root canal flora, which changes over time to a more anaerobic microbiota (microaerophilic streptococci of the "*S. milleri*" group (*S. anginosus*, *S. Constellatus* and *S. intermedius*), anaerobic streptococci (*P. anaerobius* and *P. micros*), gram-positive anaerobic rods (*Eubacterium* spp., *Actinomyces* spp. And *Propionibacterium* spp.) and gram-negative anaerobic rods (*Porphyromonas* spp., *Prevotella* spp., *Bacteroides* spp), *Campylobacter* spp., *Fusobacterium* spp. and *Treponema* spp.)^{1,4,5}

Even when the infection occurs outside the apical foramen and in the periapical tissues, immediate drainage is not possible and ongoing tissue destruction and pus formation may result. The abscess usually expands through the bone by a sinus tract formation. Microorganisms are the main etiology of apical inflammatory lesions, and the goal of endodontic treatment is the prevention and control of pulpal and periradicular infections. Various measures have been introduced to reduce the number of microorganisms from the root canal system, including various mechanical instrumentation techniques, irrigation regimes, and intracanal medicaments. It is difficult to eliminate all microorganisms from an infected root canal system by mechanical instrumentation alone.⁶ Thus, chemical irrigation and disinfection are necessary to remove microorganisms, their byproducts, pulp tissue remnants, and other debris from the root canal. The use of intracanal medication with antimicrobial activity between appointments has been recommended to eliminate possible persistent microorganisms, particularly in case of pulp necrosis with periradicular bone loss.^{7,8}

CASE REPORT

A 14 year old patient reported to the department of paediatric and preventive dentistry, Sri Guru Ram Das dental college and research institute, Amritsar with the complaint of mobile teeth with respect to lower anterior teeth region since one year. On oral examination it was seen that the right lower central and lateral incisors and left central incisor were grade 3 mobile and contacted the lingual cingulum of the opposing upper anterior teeth on occlusion. On radiographic examination a periapical radiolucency was seen wrt 31,41,42 region (Figure 1). Clinical signs

(progressive mobility, bone loss) were suggestive of trauma from occlusion. After relieving the occlusion, splinting followed by root canal treatment was planned for the involved teeth. Teeth were stabilised with a temporary splint using ligature wire (temporary splints are used to stabilise the teeth during the treatment and can be used for 6 months). The teeth were isolated using cotton rolls. In the first visit, an access cavity was prepared with a straight line entry into the root canal using tapered fissure bur. The working length was established with one mm short of the radiographic apex (figure 2). Next, pulp extirpation and complete debridement of the canal was done followed by copious irrigation with normal saline and 5% sodium hypochlorite. Open dressing was given to encourage the drainage. The patient was recalled next subsequent day and copious irrigation with saline and 5% sodium hypochlorite was performed. After drying the canals with sterile paper points calcium hydroxide paste was placed in the canals of the teeth. The access cavity was sealed with intermediate

restorative material and radiograph was taken. After 2 months, the teeth were asymptomatic. Obturation was done with gutta percha using lateral condensation followed by post endo restoration (figure 3). Splint was removed after 3 months from the first visit. Patient was recalled after one month from the removal of splint. And followed up every 6 months for one year. (figure 4)

DISCUSSION

The main goal of endodontic therapy is to eliminate or at least achieve a significant reduction of microorganisms present in the root canal system. It is well recognized that chemo-mechanical instrumentation alone is unable to completely disinfect the root canal system.^{9,10} Use of intracanal medication with antimicrobial activity between appointments has been recommended to eliminate possible persistent microorganisms, particularly in case of pulp necrosis with periradicular bone loss. Calcium hydroxide with its antimicrobial property has been widely used as inter appointment intracanal dressing.^{11,12} It has been demonstrated that treatment with calcium hydroxide as an interim dressing in the presence of large and chronic periapical lesions can create an environment more favorable to healing and encourage osseous repair. Most of the root canal microbes are unable to survive in the highly alkaline environment provided by calcium hydroxide. Several bacterial species commonly found in infected root canals are eliminated after a short period when in direct contact with calcium hydroxide. Antimicrobial activity of calcium hydroxide is related to release of hydroxyl ions in an aqueous environment. Hydroxyl ions are highly oxidant-free radicals that show extreme reactivity resulting in the damage to bacterial cytoplasmic membrane, protein denaturation, and damage to

bacterial DNA.^{9,13} It has been asserted that all biological actions of calcium hydroxide progress by the ionic dissociation in calcium ion and hydroxyl ion (Estrela 1995).¹⁴ Calcium hydroxide is often used to effect periapical healing by combination of its antimicrobial activity and its ability to promote hard tissue formation and periodontal healing. A series of studies demonstrated the antimicrobial effect of Ca(OH)₂. Several researchers investigated the effect of root canal medicaments by a direct exposure, and they found that Ca(OH)₂ was effective in killing bacteria. Mehrvarzfar *et al.* compared bioactive glass with Ca(OH)₂ and found that both exhibited antimicrobial effects against *E. faecalis* and that Ca(OH)₂ showed a superior disinfecting effect. Blanscet *et al.* found that the higher the concentration of the Ca(OH)₂ paste was, the larger were the zones of inhibition observed. Pavelic *et al.* evaluated the antimicrobial effect of Ca(OH)₂ by

using an agar diffusion method. They found that Ca(OH)₂ effectively inhibited the growth of all three microorganisms

after 24 hours, but there was a difference in the sensitivity of each microorganism, such that *Streptococcus mutans* was the most sensitive and *E. faecalis* was the least. Some have studied Ca(OH)₂, chlorhexidine (CHX), and their mixtures.^{15,16,17} Basrani *et al.*, Lin *et al.* and Ballal *et al.* found that the CHX gel was more effective than the Ca(OH)₂ paste against *E. faecalis* and *C. Albicans*.^{18,19} In the present case no carious lesion was present with periodontal attachment loss, the pulp necrosis might have occurred as a consequence of an accidental trauma which had occurred due to biting on some hard object during chewing. These hard objects are often present as impurities, like stones in the cereals and pulses. As a result of a severe impact injury which may have been caused by a small hard object, the forces may have got concentrated at small points, resulting in excessive pressure in the apical vessels, leading to an ischaemic infarction.¹⁰ Another cause may be due to trauma from occlusion which may be primary or secondary or combined. Following calcium hydroxide dressing for 2 months, the teeth were asymptomatic. Obturation was done with gutta percha using lateral condensation. Splint was removed after 3 months from the first visit. Patient was recalled after one month from the removal of splint. No mobility was present on oral examination. Radiographically, inter proximal bone formation was seen. Patient was followed up every 6 months for one year. Clinically, teeth were asymptomatic with no mobility. Radiographically, intact lamina dura with normal interproximal bone is seen with complete periapical healing.

CONCLUSION

Because the endodontic pathogens and their byproducts may affect the integrity of the periodontium, they have to be eliminated during root canal treatment. The placement of calcium hydroxide paste benefits, because of its antibacterial, proteolytic and anti-inflammatory properties.

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