TREATMENT OF PERIAPICAL ABSCESS OF SECOND MANDIBLE RIGHT PREMOLAR USING ROOT CANAL TREATMENT WITH CALCIUM HYDROXIDE-CHLORHEXIDINE 2% AS INTRACANAL MEDICATION

Lutfi Putra Perdana, S.KG(1)
Drg. Yusrini Pasril, Sp.KG(2)

(1) Student of Clinical Dentistry Program Of Universitas Muhammadiyah Yogyakarta
(2) Lecturer of School of Dentistry Universitas Muhammadiyah Yogyakarta

Introduction :

The ultimate goals of endodontic treatment are complete removal of bacteria, their by products and pulpal remnants from infected root canals and the complete seal of disinfected root canals. Intracanal medicaments have been thought an essential step in killing the bacteria in root canals; however, in modern endodontics, shaping and cleaning may be assuming greater importance than intracanal medicaments as a means of disinfecting root canals. Infected root canal caused by periapical lession needs suitable treatment. It relates to intracanal medication to support successful root canal treatment. Recent studies have suggested that Chlorhexidine could be used in combination with Ca(OH) 2 to improve antimicrobial efficacy.

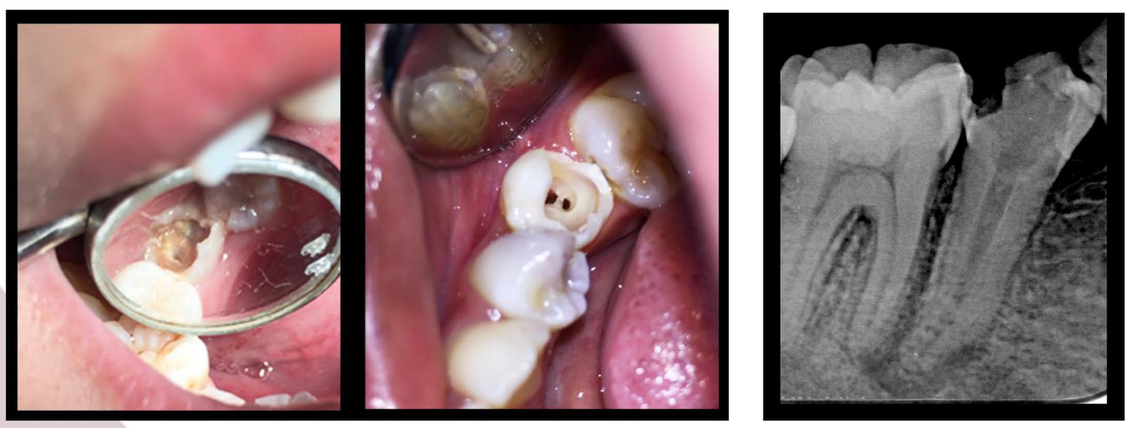
Aim:

The aim of this case report is to show the result of root canal treatment for second mandible right premolar using calcium hydroxide combine with chlorhexidine 2% as intracanal medication.

Case:

A 22 year old woman complained toothache in her lower right tooth when she used it for chewing. She ever had a spontaneous pain a year ago but it never happens again lately. The objective examination showed percussion and palpation is positive while the vitality and mobility is negative. Radiograph examination showed radiolucent area on the periapex of 45 with diffused border, periodontal ligament widening and interrupted lamina dura. Extra oral examination revealed no sign or symptom. Intraoral examination revealed a minor firm swelling of the vestibule above the apex of premolar.

On the first visit a rubber dam was placed for endodontic access and the pulp chamber was exposed clearly. Examination of the pulp floor with an endodontic explorer revealed 2 distinct canals-bucal and lingual canals. The pulp tissue was taken with barbed broach #15 and irigated with NaCl and NaOCl alternately. The working length was measured with radiographic technique and confirmed with apex locator resulted 19 mm in buccal and lingual length. The cavity was dressed by Cresophene and filled with Cavit. On the second visit the rootcanal was prepared with step-back technique using K-file #20 as IAF and K-file #35 as MAF followed by irigation using NaCl and NaOCl alternetly.



(A) **(B)**

Figure (A) Clinical Appearence before treatment
Figure (B) Radiograph of 45 before treatment

One-week recall showed hermetic obturation and there was no complain from the patient. The objective examination showed percussion and palpation were negative. Radiograph examination showed radiolucent area on the periapex of 45 with diffused border was decrease. Extra oral and intraoral examination revealed no sign or symptom.

Two-month recall showed the previous radiolucent area on the apex of 45 had disappeared. Objective examination showed negative percussion and palpation.

(C) **(D)**

Figure (C) Radiography 45 of One-week recall
Figure (D) Radiography 45 of Two-week recall

Discussion:

Calcium hydroxide release hydroxyl ion causes pH increasing that break down bacteria cytoplasm membrane. It makes protein denaturized which inhibits DNA replication of bacteria. Chlorhexidine has bacterisidal and fungisidal effect because it is absorbed to the bacteria and causes the break down of membrane cell integrity. The combination of these two substances can make synergistic antimicrobial effect. Calcium hydroxide antimicrobial action mechanism is influenced by the speed of its dissociation into calcium ions and hydroxyl ions and by inactivating enzymes of the cytoplasmic membrane of microorganisms, thus causing toxic effects on the bacterial cells. Another mechanism of action of this medication is its ability to absorb carbon dioxide, thus leading to the death of CO2–dependent bacteria, such as *Actinomyces.* Chlorhexidine gluconate is a broad-spectrum antibacterial agent whose positively charged molecules can be adsorbed onto dentin and prevent microbial colonization on the dentin surface(1). showed that chlorhexidine diffuses through the root canal, and possibly into the dentinal tubules, thus being an effective anticandidal agent(2). Interestingly, Ca(OH)2 has been shown to be inefficient in the killing of both facultative anaerobes and yeasts(3). The aim of combining Ca(OH)2 and 2% CHX gel (CG) is to enhance antimicrobial effectiveness, particularly against resistant microorganisms such as *E. faecalis* that are implicated in the failure of root canal treatment(4).The association of CHX and Ca(OH)2 has been tested against *E. faecalis* in infected bovine root dentine, demonstrating that the combined medicaments were effective(5).

Conclusion:

Root canal treatment using combination Calcium Hydroxide and Chlorhexidine 2% as intracanal medication has synergistic antimicrobial effect as showed by decreasing radiolucent area on the periapex of 45.

References

1. Zehnder M, Grawehr M, Hasselgren G, Waltimo T. Tissuedissolution capacity and dentin-disinfecting potential of calcium hydroxide mixed with irrigating solutions. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2003;96:608-613
2. Estrela C, Rodrigues de Araújo Estrela C, Bammann LL, Pecora JD. Two methods to evaluate the antimicrobial action of calcium hydroxide paste. *J Endod* 2001;27:720-723.
3. Estrela C, Estrela CRA, Moura J, Bammann LL. Testing calcium hydroxide antimicrobial potential by different methods. *J Dent Res* 2000;79:529.
4. Basrani B, Santos JM, Tjäderhane L, Grad H, GorduysusO, Huang J, Lawrence HP, Friedman S. Substantive antimicrobial activity in chlorhexidine-treated human root dentin. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2002;94:240-245
5. Waltimo TM, Sirén EK, Orstavik D, Haapasalo MP. Susceptibility of oral Candida species to calcium hydroxide *in vitro.Int Endod J* 1999;32:94-98.

Contact Person
Lutfi Putra Perdana
lutfipp@gmail.com