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

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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 medications 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 medications as a means of disinfecting root canals. Infected root canal caused by periapical lesion 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 irrigated 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 Crespohene and filled with Cavit. On the second visit the root canal was prepared with step-back technique using K-file \#20 as IAF and K-file \#35 as MAF followed by irrigation using NaCl and NaOCl alternately.

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 bacteriidal 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 CO\(_2\)-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\(^3\), showed that chlorhexidine diffuses through the root canal, and possibly into the dentinal tubules, thus being an effective anticanidial agent\(^4\). Interestingly, Ca(OH)\(_2\) has been shown to be inefficient in the killing of both facultative anaerobes and yeasts\(^5\). 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\(^6\). 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\(^7\).

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:

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Figure (A) Clinical Appearance 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.