New trends of root canal disinfection and treatment strategies for infected root canal based upon evidence- based dentistry

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The main objectives of root canal therapy are cleaning and shaping and then obturating the root canal system in 3 dimensions to prevent reinfection.

Many instrumentation techniques and devices, supported by an irrigation system capable of removing pulp tissue remnants and dentin debris, have been proposed to shape root canals. But current regimens in chemomechanical debridement using instrumentation and irrigation with NaOCl are not predictably effective in root canal disinfection. These findings are not surprising because the root canal system is complex and contains numerous ramifications and anatomical irregularities. The microorganisms in root canals not only invade the anatomic irregularities of the root canal system but also are present in the dentinal tubules.

Therefore further disinfection with an effective antimicrobial agent may be necessary and it well known that use of intracanal medication will lower bacterial count in infected root canals.

Calcium hydroxide has a long history of use in endodontics, and more attention has been given to the use of calcium hydroxide as intracanal dressing for the treatment of infected pulp. However, when treatment is completed in one visit, no intracanal medications other than intracanal irrigants are used.

Recently, a mixture of a tetracycline isomer, an acid, and a detergent(MTAD), has been introduced as a final rinse for disinfection of the root canal system. It has been shown that MTAD is able to remove the smear layer with minimal erosive changes on the surface of dentin, and is effective against *Enterococcus faecalis,* a microorganism resistant to the action of other antimicrobial medications.

In another study, the ability of MTAD was investigated to disinfect contaminated root canals with whole saliva and compared its efficacy to that of NaOCl. Based on the results, it seems that MTAD is significantly more effective than 5.25% NaOCl in eradicating bacteria from infected root canals. In the cytotoxicity evaluation, MTAD is less cytotoxic than eugenol, 3% H_2O_2, $Ca(OH)_2$ paste, 5.25% NaOCl, Peridex, and EDTA and more cytotoxic than 2.63%, 1.31% and 0.66% NaOCl.

Is it promising or transient ?