

Effectiveness of Er,Cr:YSGG laser on biofilm removal in single-canaled teeth.

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Objectives: The application of passive ultrasonic irrigation (PUI) and laser activated irrigation (LAI) during endodontic therapy have been proposed to aid in eliminating bacteria and removing the smear layer to achieve more optimal disinfection of the root canal system. This study aimed to compare the amount of viable *Enterococcus faecalis* remaining after irrigation with 0.5% NaOCl activated either with ultrasonics or Er,Cr:YSGG laser.

Experimental Methods: 40 permanent single-canaled teeth were selected, instrumented, and randomly divided into 3 groups: Group 1 (PUI), Group 2 (Er,Cr:YSGG LAI), and Group 3 (negative control). Specimens in group 1 and 2 were inoculated with *E. faecalis* ATCC 4083 and incubated for 4 weeks to allow for mature biofilm formation. Subsequently, specimens in group 1 underwent PUI irrigation with 0.5% NaOCl; specimens in group 2 underwent Er,Cr:YSGG LAI irrigation with 0.5% NaOCl according to the manufacturer's (Waterlase) recommendations. Samples were collected from the canals before irrigation (S1), to confirm presence of bacteria, and after irrigation (S2), to assess the number of viable bacteria by counting the number of colony forming units.

Results: There was a significant decrease in the number of viable bacteria when comparing S1 and S2 in Groups 1 and 2 ($P < 0.05$) but no significant difference was found between S2 in Groups 1 and 2.

Conclusion: Passive ultrasonic irrigation and Er,Cr:YSGG laser activated irrigation are both effective adjuncts at significantly reducing the amount of viable bacteria in this single canal model.

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