

Comparison of Bacterial Reduction in Straight and Curved Canals Using Erbium, Chromium:Yttrium-Scandium-Gallium-Garnet Laser Treatment versus a Traditional Irrigation Technique With Sodium Hypochlorite

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Abstract

Introduction: This study compared the reduction of *Enterococcus faecalis* in straight and curved canals using an erbium, chromium:yttrium-scandium-gallium-garnet laser and irrigation with 6.15% sodium hypochlorite (NaOCl). **Methods:** Fifty-five single-rooted extracted teeth were divided into straight and curved canal groups. The root lengths were standardized (14.0 mm) and NiTi instruments were used to prepare the canals to a size #40/0.06 taper. Irrigation was performed with 6.15% NaOCl and RCPrep (Premier Dental Products Co, Plymouth Meeting, PA) as lubricant. The smear layer was removed with 17% EDTA. The samples were sterilized, inoculated with *E. faecalis*, and incubated for 48 hours at 37° in a CO₂ chamber. They were then divided into 7 groups: NaOCl in straight canals (NS); NaOCl in curved canals (NC); laser in straight canals (LS); laser in curved canals (LC); positive control straight canals (PCS); positive control curved canals (PCC); and negative control (NegC). Bacterial reduction was measured by counting the colony-forming units (CFUs) and determining the optical density. **Results:** Groups NS, NC, and LS exhibited bacterial growth in 1 out of 10 samples (10%). In group LC, three out of 10 samples (30%) showed bacterial growth. Kruskal-Wallis showed a statistically significant difference between all treatment groups and the positive controls ($p < 0.001$). Analysis of variance showed a statistical significant difference in optic density between experimental and positive controls. **Conclusions:** Traditional irrigation techniques using 6.15% NaOCl effectively eliminated all bacteria in straight and curved canals. Er,Cr:YSGG laser also effectively removed all bacteria from straight canals. However, in three curved canals, even though there were significant bacterial reductions, they failed to render canals completely free of bacteria. (J Endod 2010;36:725–728)

Key Words

Er,Cr:YSGG laser, lasers, root canal disinfection, root canal irrigation, sodium hypochlorite

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