

# Laser Activation of Endodontic Irrigants with Improved Conical Laser Fiber Tips for Removing Smear Layer in the Apical Third of the Root Canal

ROY GEORGE, BDS, MDS, IAN A. MEYERS, BDSC, AND LAURENCE J. WALSH, PHD, DDSC

## **Abstract**

With a tube etching process, conical-ended optical fibers for middle infrared lasers that have lateral emissions can be produced, a feature of benefit for delivering laser energy onto the root canal walls. This study examined the ability of these improved laser tips when Er:YAG and Er,Cr:YSGG lasers were used in root canals in which thick smear layers had been created intentionally to provide a challenge for the laser system. Smear layer was assessed from scanning electron microscopy images with an objective digital method. Lasing improved the action of ethylene diamine tetraacetic acid with cetavlon (EDTAC) in removing smear layer. Conical fibers performed better than plain fibers, but there was no difference in performance between the 2 laser systems when matched for all other parameters. These results provide a “proof of concept” for lateral emitting fibers for endodontic procedures and illustrate the novel contribution of lasing to the action of EDTAC in dissolving smear layer. (J Endod 2008;34:1524–1527)

## **Key Words**

Dentin ablation, erbium lasers, laser dentistry, smear layer

From the School of Dentistry, University of Queensland, Brisbane, QLD, Australia.

Address requests for reprints to Professor L. J. Walsh, School of Dentistry, University of Queensland, 200 Turbot St, Brisbane, QLD 4000, Australia. E-mail address: [l.walsh@uq.edu.au](mailto:l.walsh@uq.edu.au). 0099-2399/\$0 - see front matter

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