

# In vitro preliminary study to evaluate the capability of Er,Cr:YSGG laser in posterior teeth root-canal preparation with step-back technique

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**Abstract** This preliminary study was to investigate in vitro the Er,Cr:YSGG laser ablation capability, both range (enlargement aspects of laser tips corresponded to conventional endodontic files) and quality (removing of smear layer and opening of dentinal tubules) to clean and shape the root canal for final obturation step. The crowns of 15 extracted multi-rooted posterior human teeth were resected, and then 15 canals were prepared by an Er,Cr:YSGG laser up to 1.5 W (actual power output) using the step-back technique, while the other 15 canals (control) were enlarged conventionally by K-flex file. The results revealed that posterior root-canal preparation could be achieved by laser beam transmitted to the canal using endodontic tips. At a chosen significance level of  $\alpha = 1\%$ , the results showed no significant statistical difference between the two groups ( $P > 0.01$ ). Considering the results of this current study, laser-based root-canal preparation still shows certain limitations, and further improvements are mandatory for higher achievement and better preparation outcomes.

**Keywords** Laser root-canal preparation ·  
Er,Cr:YSGG laser · Step-back technique

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