

Effect of different power parameters of Er,Cr:YSGG laser on human dentine

Piyanart Ekworapoj & Sharanbir K. Sidhu &
John F. McCabe

Received: 20 June 2006 / Revised: 4 August 2006 / Accepted: 16 November 2006 / Published online: 23 January 2007
© Springer-Verlag London Limited 2007

Abstract The aim of this work was to determine the optimal power setting of an Er,Cr:YSGG laser for cutting human dentine to produce a surface that remains suitable as a foundation on which to build and bond a dental restoration. The cutting efficiency and resulting microhardness of the dentine were evaluated for various laser power settings, and representative samples were examined by SEM. The microhardness of the dentine was significantly reduced by 30–50% ($p < 0.05$, paired *t* test) after laser irradiation, irrespective of the power setting used. The mean ablation efficiency increased in proportion to the power setting of the laser. Although the laser power setting did not affect the extent of reduction in microhardness, it did affect the microstructure of human dentine.

Keywords Er,Cr:YSGG laser · Microhardness · Laser irradiated dentine · Laser ablation · Dentine morphology

P. Ekworapoj (✉) · S. K. Sidhu · J. F. McCabe
School of Dental Sciences, Newcastle University,
Framlington Place,
Newcastle upon Tyne NE2 4BW, UK
e-mail: piyanart.ekworapoj@ncl.ac.uk

S. K. Sidhu
e-mail: s.k.sidhu@ncl.ac.uk

J. F. McCabe
e-mail: j.f.mccabe@ncl.ac.uk