

# Influence of different power outputs of intraoral Nd:YAG laser on shear bond strength of a resin cement to nickel–chromium dental alloy

Azam sadat Madani · Pedram Ansari Astaneh ·  
Sima Shahabi · Mohammad Reza Nakhaei ·  
Hossein Bagheri G. · Nasim Chiniforush

Received: 31 July 2011 / Accepted: 9 April 2012  
© Springer-Verlag London Ltd 2012

**Abstract** Up to now, there is no any experience about the application of dental lasers to bond resin composites to metal surfaces in dentistry. The aim of this preliminary study was to evaluate if the laser irradiation of ceramic-covered alloy surface would improve the bond strength of resin to metal, and if different parameters of laser output may influence the strength of this bond. Fifty three cylinders (thickness of 5 mm and diameter of 10 mm) were made up of a commercially available nickel–chromium alloy by lost-wax technique. Forty prepared specimens were divided into four groups. Five specimens in each group were covered by

slurry of dental opaque porcelain and irradiated by Nd:YAG laser using different output parameters for each group. Other five specimens in each group were treated using the same laser parameters without porcelain covering. Five sandblasted specimen served as control group. Panavia F2.0 was bonded on the metal surfaces using polyethylene tubes. In ceramic-coated specimens, silane was applied to achieve chemical bond between silica particles and resin cement. All specimens were thermocycled and subjected to shear bond strength (SBS) test (50 kgf at 0.5 mm/min). Two specimens of each ceramic-coated laser-treated groups were

A. sadat Madani · M. R. Nakhaei  
Department of Prosthodontics, School of Dentistry,  
Mashhad University of Medical Sciences,  
Mashhad, Iran

A. sadat Madani  
e-mail: madania@mums.ac.ir

M. R. Nakhaei  
e-mail: Mm\_nakhaei@yahoo.com

A. sadat Madani  
Dental Materials Research Center, Faculty of Dentistry,  
Mashhad University of Medical Sciences,  
Azadi Square, Vakilabad Highway,  
Mashhad, Iran

P. A. Astaneh  
Department of Prosthodontics, Faculty of Dentistry,  
Hormozgan University of Medical Sciences,  
Imam Hossein Blvd.,  
Bandar-Abbas, Iran  
e-mail: Ansariap861@mums.ac.ir

S. Shahabi · N. Chiniforush  
Laser Research Center in Dentistry (LRCD),  
Tehran University of Medical Sciences,  
Northern Kargar str., Hakim Highway,  
Tehran, Iran

S. Shahabi  
e-mail: shahabis@sina.tums.ac.ir

M. R. Nakhaei  
Dental Research Center, Faculty of Dentistry,  
Mashhad University of Medical Sciences,  
Azadi Square, Vakilabad Highway,  
Mashhad, Iran

H. Bagheri G. (✉)  
Research Center for Science and Technology in Medicine,  
Tehran University of Medical Sciences,  
Tehran, Iran  
e-mail: h\_bagheri@razi.tums.ac.ir

H. Bagheri G.  
Department of Dental Materials, Faculty of Dentistry,  
Tehran University of Medical Sciences,  
Northern Kargar str., Hakim Highway,  
Tehran, Iran