

## Brazilian Oral Research

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### Abstract

[FAEDA, Rafael Silveira](#) et al. Evaluation of titanium implants with surface modification by laser beam: biomechanical study in rabbit tibias. *Braz. oral res.* [online]. 2009, vol.23, n.2, pp. 137-143. ISSN . doi: 10.1590/S1806-83242009000200008.

The purpose of the present study was to evaluate, using a biomechanical test, the force needed to remove implants with surface modification by laser (Nd:YAG) in comparison with implants with machined surfaces. Twenty-four rabbits received one implant with each surface treatment in the tibia, machined surface (MS) and laser-modified surface (LMS). After 4, 8 and 12 weeks of healing, the removal torque was measured by a torque gauge. The surfaces studied were analyzed according to their topography, chemical composition and roughness. The average removal torque in each period was 23.28, 24.0 and 33.85 Ncm for MS, and 33.0, 39.87 and 54.57 Ncm for LMS, respectively. The difference between the surfaces in all periods of evaluation was statistically significant ( $p < 0.05$ ). Surface characterization showed that a deep and regular topography was provided by the laser conditioning, with a great quantity of oxygen ions when compared to the MS. The surface micro-topography analysis showed a statistical difference ( $p < 0.01$ ) between the roughness of the LMS ( $R_a = 1.38 \pm 0.23 \mu\text{m}$ ) when compared to that of the MS ( $R_a = 0.33 \pm 0.06 \mu\text{m}$ ). Based on these results, it was possible to conclude that the LMS implants' physical-chemical properties increased bone-implant interaction when compared to the MS implants.

Keywords : Dental implants; Lasers; Osseointegration.

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*Sociedade Brasileira de Pesquisa Odontológica*

Av. Lineu Prestes, 2227  
Caixa Postal 8216  
05508-900 São Paulo SP - Brazil  
Tel./Fax: +55 11 3091-7810

 e-Mail

[bor@sbpgo.org.br](mailto:bor@sbpgo.org.br)