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> [J Oral Implantol](#), 42 (4), 316-20 Aug 2016

Effects of a Low-Intensity Laser on Dental Implant Osseointegration: Removal Torque and Resonance Frequency Analysis in Rabbits

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Abstract

The objective of this study was to investigate how a low-intensity laser affects the stability and reverse torque resistance of dental implants installed in the tibia of rabbits. Thirty rabbits received 60 dental implants with the same design and surface treatment, one in each proximal metaphysis of the tibia. Three groups were prepared (n = 10 animals each): conventional osseointegration without treatment (control group), surgical sites irradiated with a laser beam emitted in the visible range of 680 nm (Lg1 group), surgical sites irradiated with a laser beam with a wavelength in the infrared range of 830 nm (Lg2 group). Ten irradiation sessions were performed 48 hours apart; the first session was during the immediate postoperative period. Irradiation energy density was 4 J/cm² per point in 2 points on each side of the tibias. The resonance frequency and removal torque values were measured at 2 time points after the implantations (3 and 6 weeks). Both laser groups (Lg1 and Lg2) presented a significant difference between resonance frequency analysis values at the baseline and the values obtained after 3 and 6 weeks (P > .05). Although the removal torque values of all groups increased after 6 weeks (P < .05), both laser groups presented greater mean values than those of the control group (P < .01). Photobiomodulation using laser irradiation with wavelengths of 680 and 830 nm had a better degree of bone integration than the control group after 6 weeks of observation time.

Keywords: dental implants; low-intensity laser therapy; osseointegration; photobiomodulation; removal torque; resonance frequency analysis.

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