

Wavelength - 685 nm vs 830 nm in Tendon Repair

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Comparative Study Using 685-nm and 830-nm Lasers in the Tissue Repair of Tenotomized Tendons in the Mouse.

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Objective: The objective of this study was to evaluate the effects of 685- and 830-nm laser irradiations, at different fluences on the healing process of Achilles tendon (Tendon calcaneo) of mice after tenotomy. **Background Data:** Some authors have shown that low-level laser therapy (LLLT) is able to accelerate the healing process of tendinuos tissue after an injury, increasing fibroblast cell proliferation and collagen synthesis. However, the mechanism by which LLLT acts on healing process is not fully understood. **Methods:** Forty-eight male mice were divided into six experimental groups: group A, tenomized animals, treated with 685 nm laser, at the dosage of 3 J/cm(2); group B, tenomized animals, treated with 685-nm laser, at the dosage of 10 J/cm(2); group C, tenomized animals, treated with 830-nm laser, at dosage of 3 J/cm(2); group D, tenomized animals, treated with 830-nm laser, at the dosage of 10 J/cm(2); group E, injured control (placebo treatment); and group F, non-injured standard control. Animals were killed on day 13 post-tenotomy, and their tendons were surgically removed for a quantitative analysis using polarization microscopy, with the purpose of measuring collagen fibers organization through the birefringence (optical retardation [OR]). **Results:** All treated groups showed higher values of OR when compared to injured control group. The best organization and aggregation of the collagen bundles were shown by the animals of group A (685 nm, 3 J/cm(2)), followed by the animals of group C and B, and finally, the animals of group D. **Conclusion:** All wavelengths and fluences used in this study were efficient at accelerating the healing process of Achilles tendon post-tenotomy, particularly after the 685-nm laser irradiation, at 3 J/cm(2). It suggests the existence of wavelength tissue specificity and dose dependency. Further studies are required to

investigate the physiological mechanisms responsible for the effects of laser on tendinous repair.

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