

## Low-Level Laser Therapy on Tissue Repair of Partially Injured Achilles Tendon in Rats

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### Abstract

**Objective:** The aim of this study was to assess the alignment and type of collagen (I and III) in partially injured Achilles tendons of rats treated with low-level laser therapy (LLLT).

**Background:** Achilles tendons present high indices of injury and their regeneration process may take a long time. LLLT has been used to accelerate and enhance injured Achilles tendon repair.

**Methods:** Sixty-five male Wistar rats were distributed into seven groups: LASER 1, 3, and 7 (the rat's Achilles tendons were partially injured and submitted to treatment for 1, 3, or 7 days, respectively); a Sham group 1, 3, and 7 for each of LASER group (same injury, but the LLLT was only simulated), and five remaining animals were allocated to the control group (no procedures were performed). The 780nm LLLT was applied once a day, with 70mW of mean power, fluence of 17.5 J/cm<sup>2</sup> for 10 sec. After the rats were euthanized, the tendons were surgically removed and assessed by birefringence technique (collagen alignment) and picosirius red (collagen I and III). **Results:** Sham versus LASER analysis did not show differences ( $p > 0.05$ ) for collagen alignment. The collagen composition (median) was significantly different ( $p < 0.05$ ) for LASER 3 (I: 16.5; III: 83.5) versus Sham 3 (I: 12.5; III: 87.5) and LASER 7 (I: 20.2; III: 79.8) versus Sham 7 (I: 10.2; III: 89.8). LASER groups exhibited a higher percentage of type I collagen and a lower percentage of type III collagen.

**Conclusions:** LLLT stimulated collagen I proliferation, improving the injured Achilles tendons' healing process.