

Photomedicine and Laser Surgery

Comparative Study of How Low-Level Laser Therapy and Low-Intensity Pulsed Ultrasound Affect Bone Repair in Rats

Objective: This study aimed to compare the consequences of low-level laser therapy (LLLT) and low-intensity pulsed ultrasound (LIPUS) on bone repair. **Background Data:** Many studies have assessed the effects of LLLT and LIPUS on bone repair, but a comparison of them is rare. **Methods:** Male Wistar rats (n = 48) with tibial bone osteotomy were used. One group had the osteotomized limb treated with LLLT (GaAlAs laser, 780 nm, 30 mW, 112.5 J/cm²) and the second group with LIPUS (1.5 MHz, 30 mW/cm²), both for 12 sessions (five times per week); a third group was the control. After 20 days, rats were sacrificed and had their tibias submitted to a bending test or histomorphometric analysis. **Results:** In the bending test, maximum load at failure of LLLT group was significantly higher ($p < 0.05$). Bone histomorphometry revealed a significant increase in osteoblast number and surface, and osteoid volume in the LLLT group, and a significant increase in eroded and osteoclast surfaces in the LIPUS group. **Conclusion:** LIPUS enhanced bone repair by promoting bone resorption in the osteotomy area, while LLLT accelerated this process through bone formation.

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