

Effect of low-power GaAlAs laser (660 nm) on bone structure and cell activity: an experimental animal study

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Abstract

Low-level laser therapy (**LLLT**) is increasingly being used in the regeneration of soft tissue. In the regeneration of hard tissue, it has already been shown that the biomodulation effect of lasers repairs bones more quickly.

We studied the activity in bone cells after **LLLT** close to the site of the bone injury. The femurs of 48 rats were perforated (24 in the irradiated group and 24 in the control group) and the irradiated group was treated with a GaAlAs laser of 660 nm, **10J/cm²** of radiant exposure on the 2nd, 4th, 6th and 8th days after surgery (DAS).

We carried out histomorphometry analysis of the bone. We found that activity was higher in the irradiated group than in the control group: (a) bone volume at 5 DAS ($p=0.035$); (b) osteoblast surface at 15 DAS ($p=0.0002$); (c) mineral apposition rate at 15 and 25 DAS ($p=0.0008$ and 0.006); (d) osteoclast surface at 5 DAS and 25 DAS ($p=0.049$ and $p=0.0028$); and (e) eroded surface ($p=0.0032$).

We concluded that LLLT increases the activity in bone cells (resorption and formation) around the site of the repair without changing the bone structure.