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**PHOTOBIOIMODULATION IN THE HEALING OF WOUNDS CLOSED WITH
POLYFILAMENT SUTURES (AN EXPERIMENTAL STUDY)**

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Abstract: Background. Polyfilament surgical sutures provide high mechanical strength but are often associated with enhanced local inflammatory reactions and delayed wound healing. Photobiomodulation using low-intensity laser and LED irradiation has demonstrated anti-inflammatory and regenerative properties, yet its effect on wounds closed with polyfilament sutures remains insufficiently studied.

Objective. To experimentally evaluate the influence of photobiomodulation on tissue response and healing dynamics in wounds closed with polyfilament sutures.

Methods. The study was conducted at the Department of Experimental Surgery and the Laboratory of Pathomorphology of the Republican Specialized Scientific and Practical Medical Center of Surgery named after Academician V. V. Vakhidov (Tashkent, Uzbekistan). Male outbred white rats (n = 30 per group), weighing 210-250 g, were housed under standard vivarium conditions. All procedures were approved by the Local Ethics Committee and complied with the European Convention for the Protection of Vertebrate Animals (Strasbourg, 1986). Linear dorsal skin wounds were sutured with polyfilament Ethibond. Animals in the experimental group received daily low-intensity laser and LED irradiation for 10 days, while controls healed without phototherapy. Microcirculation was assessed by laser Doppler flowmetry. Morphological evaluation was performed on postoperative days 3, 7, 10, 15, and 30 using light and scanning electron microscopy.

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Results. Control animals demonstrated pronounced inflammatory infiltration, edema, and fibrin deposition around sutures. Photobiomodulation significantly reduced inflammatory cell density, enhanced microcirculation, accelerated fibroblast proliferation, and stimulated angiogenesis. Treated wounds showed earlier transition to the proliferative phase and improved collagen organization.

Conclusion. Photobiomodulation effectively modulates suture-tissue interaction, reduces inflammation, and accelerates healing of wounds closed with polyfilament sutures. This method may serve as a promising adjunct in minimally invasive surgical practice.