The new heterologous fibrin sealant in combination with low-level laser therapy (LLLT) in the repair of the buccal branch of the facial nerve.

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Abstract:

This study aimed to evaluate the effects of low-level laser therapy (LLLT) in the repair of the buccal branch of the facial nerve with two surgical techniques: end-to-end epineural suture and coaptation with heterologous fibrin sealant. Forty-two male Wistar rats were randomly divided into five groups: control group (CG) in which the buccal branch of the facial nerve was collected without injury; (2) experimental group with suture (EGS) and experimental group with fibrin (EGF): The buccal branch of the facial nerve was transected on both sides of the face. End-to-end suture was performed on the right side and fibrin sealant on the left side; (3) Experimental group with suture and laser (EGSL) and experimental group with fibrin and laser (EGFL). All animals underwent the same surgical procedures in the EGS and EGF groups, in combination with the application of LLLT (wavelength of 830 nm, 30 mW optical power output of potency, and energy density of 6 J/cm²). The animals of the five groups were euthanized at 5 weeks post-surgery and 10 weeks post-surgery. Axonal sprouting was observed in the distal stump of the facial nerve in all experimental groups. The observed morphology was similar to the fibers of the control group, with a predominance of myelinated fibers. In the final period of the experiment, the EGSL presented the closest results to the CG, in all variables measured, except in the axon area. Both surgical techniques analyzed were effective in the treatment of peripheral nerve injuries, where the use of fibrin sealant allowed the manipulation of the nerve stumps without trauma. LLLT exhibited satisfactory results on facial nerve

regeneration, being therefore a useful technique to stimulate axonal regeneration process.