

Mechanical resistance of peripheral nerve repair with biological glue and with conventional suture at different postoperative times.

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Abstract:

Regardless of its type, the repair of a peripheral nerve must ideally permit early motion of the affected limb and resist disruption by the tensile forces generated throughout the healing process and regeneration. A comparative study of the mechanical resistance of the repair of the sciatic nerve with biological glue and conventional microsurgical suture over time was undertaken in 48 rats. Both right and left sciatic nerves were exposed simultaneously and repaired at random with the glue on one side and conventional suture on the opposite side. Mechanical resistance of the repair was evaluated in situ with a universal testing machine using a hooklike accessory applied proximally to the repair site, immediately and at 7, 14, and 28 days postoperatively. A load was applied at the rate of 2 mm/min till rupture. The resistance of both types of repair significantly increased up to day 14 ($P < 0.001$), and the repair with the glue was significantly less resistant than repair with conventional suture immediately postoperatively ($P < 0.001$) and on day 7 ($P = 0.03$). Resistance became equivalent for the two types of repair on days 14 ($P = 0.67$) and 28 ($P = 0.34$). The change in resistance of both types of repair with time was in accordance with the power function numeric formula.