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Poster Presentation

Local Administration of Methylprednisolone Laden Hydrogel Enhances Functional Recovery of Transected Sciatic Nerve in Rat

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Abstract

The repair of peripheral nerve injuries is still one of the most challenging tasks and concerns in neurosurgery. Effect of methylprednisolone-laden hydrogel loaded into a chitosan conduit on the functional recovery of peripheral nerve using a rat sciatic nerve regeneration model was assessed. A 10-mm sciatic nerve defect was bridged using a chitosan conduit (CHIT/CGP-Hydrogel) filled with CGP-hydrogel. In autograft group (AUTO) a segment of sciatic nerve was transected and reimplanted reversely. In methylprednisolone treated group (CHIT/MP) the conduit was filled with methylprednisolone-laden CGP-hydrogel. The regenerated fibers were studied within 16 weeks after surgery. The behavioral, functional and electrophysiological studies confirmed faster recovery of the regenerated axons in methylprednisolone treated group compared to CHIT/Hydrogel group ($P < 0.05$). The mean ratios of gastrocnemius muscles weight were measured. There was statistically significant difference between the muscle weight ratios of CHIT/MP and CHIT/Hydrogel groups ($P < 0.05$). Morphometric indices of regenerated fibers showed number and diameter of the myelinated fibers were significantly higher in CHIT/MP than in CHIT/Hydrogel group. Methylprednisolone-laden hydrogel when loaded in a chitosan conduit resulted in improvement of functional recovery and quantitative morphometric indices of sciatic nerve. It may have clinical implications for the surgical management of patients after facial nerve transection injuries.

Keywords: Peripheral Nerve Repair, Methylprednisolone, Chitosan Conduit, Sciatic Nerve, Rat

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