Allograft Nerve Grafting of the Posterior Interosseous Nerve Following Trauma

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Case Overview: We present a case of a 38-year-old male presenting for follow up treatment regarding a circular saw injury to the forearm. He presented to clinic 5 days after the injury in a posterior slab and sugar-tong splint with thumb completely covered and tips of his index through small fingers exposed. The patient rated their pain a 1/10 but was unable to extend the wrist or fingers. Physical exam indicated the patient did not have an active EPL, EDL, EIP, ECRL, or ECRB. Radiographs were unremarkable and no fractures or dislocations were noted. After discussing treatment options, the patient elected to undergo an exploratory operation with possible repair of extensor muscles and repair via grafting of the posterior interosseous nerve (PIN).

Method/technique: With the patient in supine position, the prior incision was elongated proximally and distally in a lightning fashion. Flaps were elevated and secured with a nylon suture and the deep muscle intervals between the ECRL/B and EDC were identified. These planes were developed carefully, and the motor branches were found and traced proximally to the posterior interosseous nerve proper. The PIN was found to be transected distal to the supinator and proximal to all the branches to the forearm musculature. Once both distal and proximal ends of the nerve were identified they were cleaned, and the gap between the ends was measured to be 2 cm. The nerve was repaired using grafting under microscope with 8-0 nylon in a figure eight fashion and both coaptations were wrapped with a nerve protector.

Results: The patient was placed in a thermoplastic splint up to the elbow and returned for his 6-week follow up visit. He reported a pain rating of 0/10 and attended occupational therapy once a week. On physical exam it was noted that the patient was doing exceptionally well and had function of his ECRL and ECRB. More follow up data will be collected, and a positive prognosis is expected.

Summary: Early identification of PIN palsy has been linked to significantly better outcomes relative to other nerve injuries. End-to-end anastomosis or nerve grafting can lead to a full recovery in young adults and is suggested until the 6th month following injury.

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