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Advantages Of Autologous Sural Nerve Graft In The Repair Of Median Nerve: A Case Report

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Abstract

Background: Treatment options of peripheral nerve injuries are limited to primary nerve repair, nerve grafting, and tendon transfers. In this case, an adequate and suitable donor site was easily accessible.

Description: 38 year old male, with alleged history of glass cut injury to right forearm with visible deformity in the right hand along with clinical signs of median nerve injury with ultrasonography suggestive of complete transection of the median nerve at mid forearm with 4 cm defect in the median nerve repaired with left sural nerve cable graft.

Conclusion: Recovery of motor function after nerve grafting is dependent on motor axons reinnervating target muscles, making proximal nerve injuries problematic. The advantages of sural nerve grafts over other.

Keywords: median nerve , sural nerve graft

Introduction

Peripheral nerve defects occur as a result of the segmental loss of nerve, whether acutely in the traumatic setting or intentionally in the treatment of lesions-in-continuity or tumors.

Autologous nerve grafts are preferred with donor sites to include sural, superficial radial, and medial cutaneous sensory nerves [2].

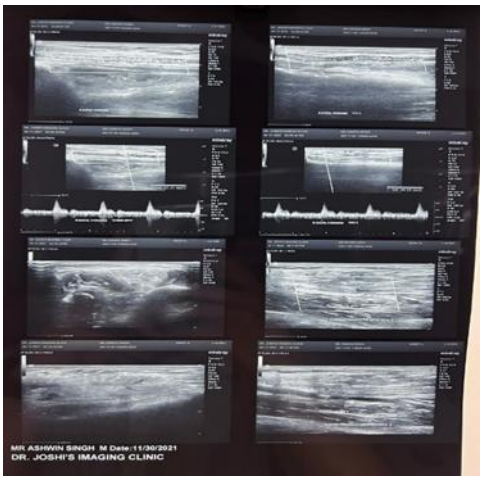
Options for treating peripheral nerve injuries include primary nerve repair, nerve grafting, and tendon transfers [1,3,4]. Recovery of motor function after nerve grafting is dependent on motor axons reinnervating target muscles before neuromuscular junction degeneration [1,3,4]. This makes proximal nerve injuries or long nerve gaps problematic because of the time it takes for regenerating axons to reach target muscles before they become reinnervation resistant. Autologous nerve grafts (e.g. sural nerve) are preferred but are limited by graft availability, donor site morbidity, and intolerable neuropathic pain[1,3,4].

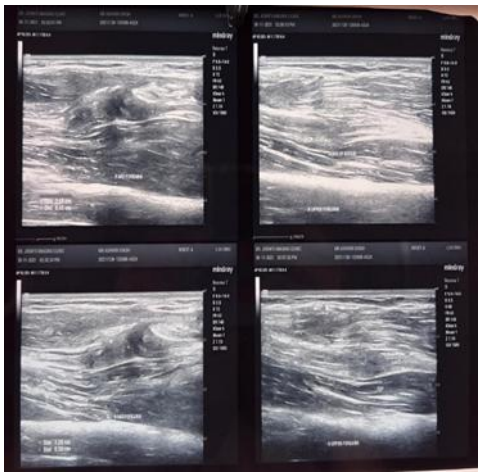
Case Report:

A 38 year old male, presented to the orthopaedics department with history glass cut injury to the right forearm and with ulnar nerve, ulnar artery and flexor tendon repair done.

Patient presented with new complaints of claw hand, tingling and reduced sensations over index and middle finger with intrinsic wasting and 1st web space wasting. Tinel sign positive. Ultrasonography of right forearm showing complete transection of the median nerve in the mid forearm with stump neuromas measuring 1.6x 0.6 cm over the upper stump and 1.2x 0.6 cm over the lower stump and the

nerve proximal and distal to these neuromas showing normal echopattern.





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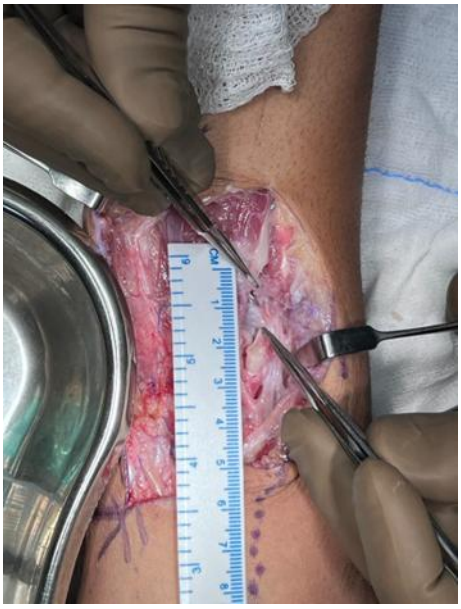

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a) Median nerve neuroma with proximal and distal normal nerve portion
b) visible defect after excising the neuroma around 4cm
c) sural nerve identified posterolateral to the short saphenous vein
d) 12 cm sural nerve graft with proximal end marked
e) interposition sural nerve cable graft using Prolene 6-0
f) tissue glue used to fix the sutured ends

Discussion And Comments:

Options for treating peripheral nerve injuries include primary nerve repair, nerve grafting, and nerve transfers [1,3,4]. Primary nerve repair is possible when nerve ends can be anastomosed in a tension-free fashion, usually in an end-to-end fashion. Nerve grafts are necessary in order to bridge physical or functional gaps in nerves [2]. Autologous nerve grafts are preferred with donor sites to include sural, superficial radial, and medial cutaneous sensory nerves [2]. Autologous grafts are limited by graft availability, donor site morbidity, and intolerable neuropathic pain [1,3]. Transfer of neighbouring motor fascicles to injured nerves can be accomplished in brachial plexus injuries with donor sites to include the dorsal scapular, accessory, ulnar, and intercostal nerves [2]. Ultimately, recovery of motor function after nerve grafting is dependent on motor axons reinnervating target muscles before neuromuscular junction degeneration [1,3,4]. Compared to the other vascularized nerve graft already described, our sural nerve graft has many advantages: 1) A “double or triple” sural nerve graft can be designed, as described above, when the nerve graft is bisected or trisected and folded on itself without damage to its mesoneurium or vessels. Other vascularized nerve grafts cannot be designed in this fashion. The sural nerve has a relatively small diameter as compared to the major nerve in the upper extremities. However, a “two- or three-fold’’ sural nerve can compensate its discrepancy of the diameter. 2) Survival of the nerve graft can be discerned early, by monitoring circulation of the accompanying flap. 3) Skin defect at the recipient site can be closed by the accompanying flap without additional vascular anastomosis as described in case 2. 4) Some loss of sensation is negligible at the donor site. In most of the cases with excision of the sural nerve, their sensory changes, though variable in its extent, produced no disability[5]

Conclusion:

Autologous Sural nerve graft is a suitable graft for major nerve repairs. Patient on regular follow up has a significant improvement in his symptoms . No problems faced at the donor nerve graft site making sural nerve graft an ideal for major nerve repair surgeries.

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