Malaysian Orthopaedic Journal 2023 Vol 16, Supplement A

Very distal nerve transfer for sensory reconstruction in high median nerve injury

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INTRODUCTION :

Very distal nerve transfer can be a success in high median nerve injury. We report a successful reconstruction of thumb and index finger sensation with restoration of thumb and index finger flexion.

REPORT:

A 33-year-old man presented with right high median nerve injury at the axillary level in February 2022. Preoperatively, he was unable to flex his thumb, index finger, and middle finger. Thumb abduction and opposition were also absent. Sensory loss was reported on the volar aspect of the radial three and a half fingers of the right hand. Distal motor and sensory end-to-end nerve transfers were performed one month later. The injured median nerve at the axilla was repaired with a sural nerve graft.

To restore anterior interosseous nerve (AIN) function, the donor nerve to extensor carpi radialis brevis (ECRB) was transferred to restore index finger and thumb flexion. To restore thenar muscle function, the donor nerve to abductor digiti minimi (ADM) was transferred.

To restore sensation to the index and thumb, the dorsal digital nerves from the superficial radial nerve were transferred. For the thumb, the ulnar-sided dorsal radial digital nerve was transferred to the (volar) ulnar-sided digital nerve. For the index finger, the radial-sided dorsal radial digital nerve was transferred to the (volar) radial-sided digital nerve. Refer to Figure 1.

At about 5-months post-surgery, the patient started to have some sensory recovery over the volar tip of the thumb and index finger. At 1-year post-surgery, the motor function is at least grade 3 for the thumb flexion and index finger flexion – the patient is able to clench his fist normally. The sensation over the tip of the thumb was present, the patient was able to feel sharp sensation and localise it to the tip. However, the sensation over the tip of the index finger was abnormal, in which on pricking the tip of the finger, the patient localised the sensation to the dorsum of the index finger.

Sensation over the middle finger has not yet recovered as no nerve transfer was performed.

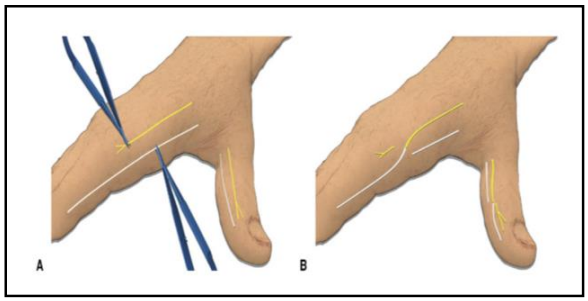

Figure 1 : (Bertelli 2011.)

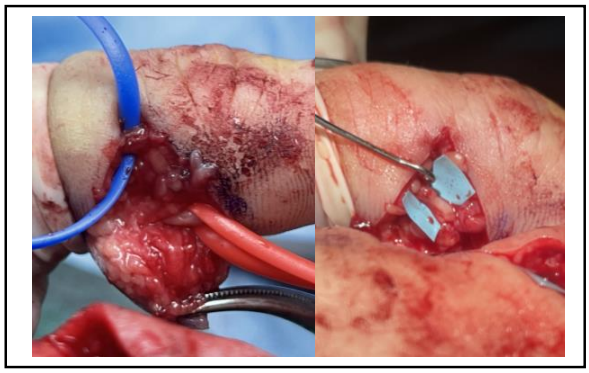

Figure 2 : Intraoperative photo of sensory nerve transfer for the thumb before and after coaptation.

Monofilament mapping was not performed in this patient.

CONCLUSION:

Distal sensory nerve transfer is a useful surgery to enhance early recovery of sensation at the fingertips in high median nerve injury. Standard treatment of nerve repair with grafting without transfer will take a long time, in this patient probably at least 2 years.

REFERENCES:

Bertelli, J. A., & Ghizoni, M. F. (2011). Very Distal Sensory Nerve Transfers in High Median Nerve Lesions. The Journal of Hand Surgery, 36(3), 387-393. doi: https://doi.org/10.1016/j.jhsa.2010.11.049