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Restoring Thumb Pulp Sensibility with Dual Radial Sensory Nerve Transfer: A Case Report and Technical Note

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Abstract | **Case Report**

We report a 30-year-old woman with complete loss of thumb pulp sensibility secondary to a traumatic median nerve injury at the wrist sustained two years earlier. Two branches of the superficial radial sensory nerve were transferred to the radial and ulnar digital nerves of the thumb. At one-year follow-up, protective sensation was restored with static two-point discrimination of 4 mm, satisfactory Semmes-Weinstein testing, return to activities of daily living, and no donor-site morbidity.

Keywords: Median nerve injury, Nerve transfer, Superficial radial nerve, Thumb pulp sensibility, Sensory reconstruction, Two-point discrimination.

INTRODUCTION

Thumb pulp sensibility is essential for precision pinch, stereognosis, grip modulation and hand protection. Chronic median nerve injuries remain difficult to treat because of prolonged denervation and the long distance required for axonal regeneration after proximal repair. Distal sensory nerve transfer may overcome these limitations.

CASE REPORT

A 30-year-old female presented two years after traumatic median nerve injury at the wrist with complete loss of thumb pulp sensibility. The dorsal thumb territory supplied by the superficial radial sensory nerve remained intact. Because of the chronic delay and poor prospects for meaningful recovery after proximal reconstruction, distal sensory nerve transfer was proposed.

Figure 1: Clinical photograph showing the skin marking of the lateral incision

Figure 2: Clinical photograph showing the skin marking of the medial incision

Surgical Technique

Two dorsal sensory branches of the superficial radial nerve were identified and mobilized. The radial and ulnar digital nerves of the thumb were exposed and found suitable for reconstruction. Tension-free end-to-end microsurgical coaptation was performed without nerve grafting.

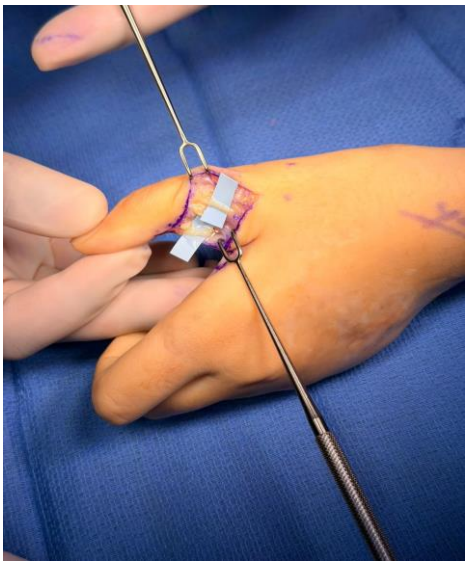

Figure 4: Exposure of the radial sensory and thumb digital nerves

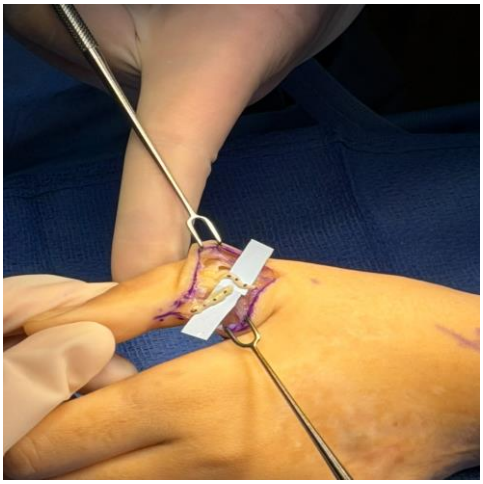

Figure 7: Intraoperative demonstration of tension-free repair with nerve orientation marked

Figure 9: Microscopic repair

Figure 10: Final appearance before closure

RESULTS

The postoperative course was uneventful. Progressive sensory recovery was observed during follow-up. At 12 months, protective sensibility was restored throughout the thumb pulp. Static two-point discrimination measured 4 mm. Semmes-Weinstein monofilament testing confirmed satisfactory sensory recovery. The patient regained the ability to perform precision pinch activities and returned to normal activities of daily living. No neuroma formation, chronic pain, hypersensitivity, or significant donor-site morbidity was observed. Overall patient satisfaction was high.

DISCUSSION

Restoration of thumb pulp sensibility remains one of the major challenges in peripheral nerve reconstruction. Conventional repair and grafting may provide suboptimal outcomes in chronic median nerve injuries because of prolonged denervation and long regeneration distances. Distal nerve transfer reduces this distance and delivers healthy donor axons close to the target territory. The superficial radial sensory nerve is particularly attractive because of its anatomical proximity to the thumb and its relatively expendable sensory territory. In the present case, two donor branches were transferred to both digital nerves of the thumb, maximizing sensory input to the pulp. The excellent recovery obtained, including a static two-point discrimination of 4 mm, supports the effectiveness of this strategy. Absence of donor-site morbidity further strengthens the value of this approach. Although limited by its single-case design, this report suggests that dual superficial radial sensory nerve transfer may represent an effective salvage option in chronic median nerve injuries when conventional reconstruction is unlikely to succeed.

CONCLUSION

Dual superficial radial sensory nerve transfer provided excellent restoration of thumb pulp sensibility after chronic median nerve injury. The technique avoided nerve grafting, allowed tension-free repair, and resulted in meaningful functional recovery.

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