

Preserved Sensation of the Palmar Radial Hand by the Superficial Branch of the Radial Nerve Following Median Nerve Laceration

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INTRODUCTION

- Multiple variations of sensory innervation patterns in the hand exist and are well recognized in the literature.
- These aberrant patterns can lead to diagnostic challenges and complicate the treatment of nerve-injured patients.
- To date, most descriptions of aberrant innervation patterns in the upper extremity involve interneural connections between branches of the median and ulnar nerves (i.e. Martin-Gruber and Riche-Cannieu anastomoses) with a paucity of descriptions involving the radial nerve.
- This report describes the paradoxical preservation of sensation to the base of the thenar eminence and the palmar aspects of the thumb, index, and long fingers in the presence of a proximal median nerve transection

CASE REPORT

- A 26-year-old male military service member sustained a high-velocity gunshot wound to the mid brachium of the left upper extremity resulting in transection of the brachial artery, a 6 cm defect of the ulnar nerve, and a 10 cm defect of the median nerve.
- The patient underwent emergent reconstruction of the brachial artery with a reverse saphenous vein graft.
- Following recovery from this revascularization surgery, the patient's physical exam findings showed an absence of median nerve motor function but preserved sensation in the to the palmar and dorsal aspects of radial hand encompassing the base of the thenar eminence, thumb, index, and long fingers (Figure 1).
- Further investigation of this peculiar finding with electrodiagnostic study and selective nerve blockade revealed that his preserved sensation to the base of the thenar eminence and the palmar aspects of the thumb, index, and long fingers was provided by the SBRN.
- The status of his neurologic exam remained unchanged over the ensuing 6 months, at which time, he underwent an ulnar nerve grafting procedure in the brachium followed by multiple tendon transfers designed to reanimate his hand and wrist flexion.

CASE REPORT (continued)

- Based upon the very proximal location of the large median nerve defect, closely located to the brachial artery graft, and the aberrant preservation of sensation of the radial hand, the surgical team did not reconstruct the median nerve gap as it did not seem clinically necessary or worth the added risk.
- At the time of his most recent clinical examination one year following injury and six months following his reconstructive surgeries, the patient had regained rudimentary flexion of the digits and wrist with a marching Tinel's sign of the ulnar nerve in the forearm.

DISCUSSION

- In the setting of a proximal median nerve transection, it is expected that sensation over the palmar radial surface of the hand and radial digits will be absent. Paradoxically, the patient's clinical exam demonstrated retained sensation over this classically described median nerve sensory distribution.
- SBRN typically provides sensation to the dorsoradial wrist and the dorsum of the radial 2 ½ or 3 ½ digits.^{1,2}
- Dorsal-to-palmar sensory innervation of the digits involving the SBRN has been described before with the majority of these descriptions focusing on the thumb.³⁻⁵ Although similar, the various interconnections described in these studies do not entirely account for the distribution of preserved sensation seen with the Semmes-Weinstein monofilament testing of this case report's patient which demonstrated preserved sensation in the base of the thenar eminence and along the full lengths of the thumb, index, and long fingers.

CONCLUSION

- This report further demonstrates the variety of anomalous innervation patterns in the hand, which in this case, obviated the need for a difficult median nerve grafting in the proximal brachium.
- The findings from this report are helpful in better understanding upper extremity peripheral nerve injuries presenting with unusual patterns of sensation, interpreting their electrodiagnostic studies, and in performing their reconstructive surgeries.

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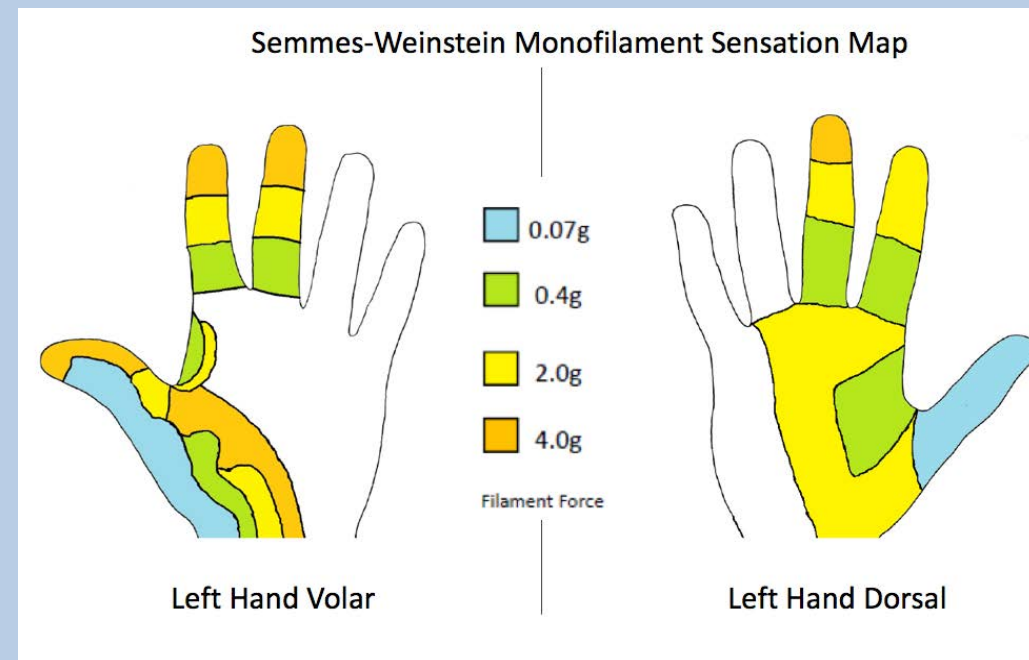


Figure 1. Areas of preserved sensation based on Semmes-Weinstein monofilament testing.

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