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Case Report

Anomalies in the Dorsal Cutaneous Innervation of the Hand - Case Report

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Abstract

Normally the cutaneous innervation of the dorsum of the hand is supplied by the radial and ulnar nerves as lateral three and half fingers by the radial nerve and medial one and half fingers by the ulnar nerve. In one of the case the cutaneous innervation of dorsum of the hand is supplied by both of the radial and ulnar nerves, but the area of distribution is different from the usual way of distribution, here lateral two and half fingers is supplied by radial nerve and medial two and half fingers is supplied by ulnar nerve. This anatomical variation is more essential for clinicians and neurosurgeon for surgical procedures on the dorsum of the hand.

Keywords: *Cutaneous Innervation; Dorsum of the Hand; Ulnar Nerves; Radial Nerve*

Introduction

Normally cutaneous innervation of the dorsum of the hand and digits are supplied by dorsal branch of radial and ulnar nerves. The superficial branch of radial nerve supplies the lateral three and half fingers with five digital branches. The dorsal branch of ulnar nerve supplies the medial one and half fingers with its two dorsal digital branches. The median nerve also supplies dorsal aspect of distal phalanx of the lateral three and half fingers. Though this is normal, many studies have indicated a high degree of variation in the cutaneous innervation of dorsum of the hand.

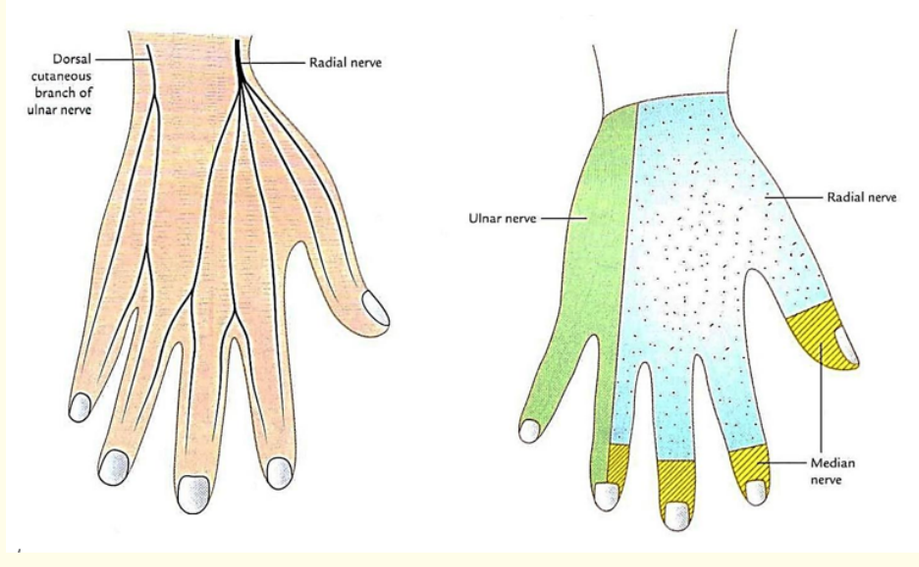

Figure 1: *Normal anatomy of cutaneous innervations of the hand.*

Observation

During my routine dissection for the undergraduates in Amala Institute of Medical Sciences, India, we encountered an anatomical variation in the cutaneous innervation of the dorsum of the hand in a 68 years old female cadaver as follows. The superficial branch of the radial nerve supplies the lateral two and half fingers in the dorsum of the hand. The dorsal branch of the ulnar nerve supplies the medial two and half fingers in the dorsum of the hand. Also, there is no communication between the dorsal branches of the radial and ulnar nerves.

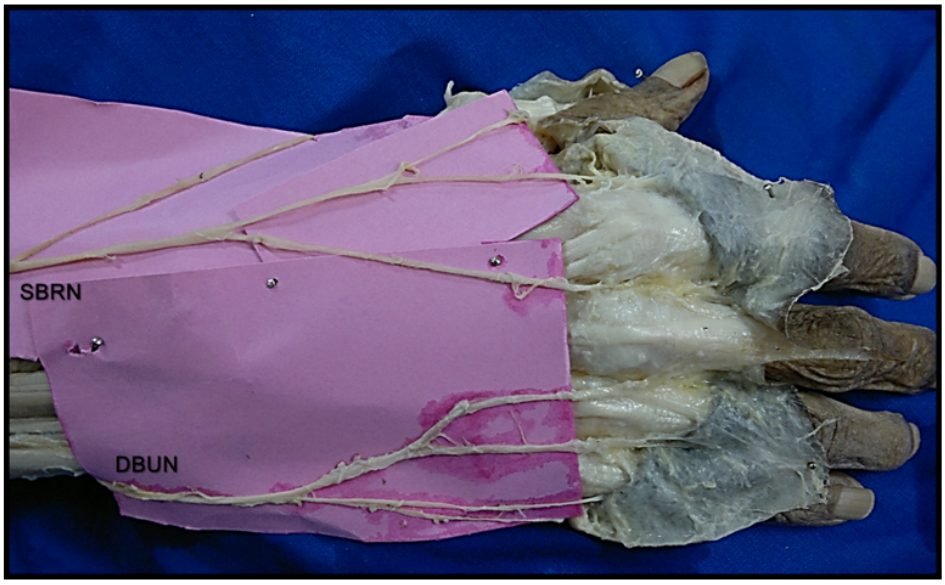

Figure 2: *Variation in the cutaneous innervation of dorsum of hand.*

Discussion

The dermatomes for innervation of the dorsal and palmar surface of the hand are C6, C7 and C8. The wide area of the hand and digits are supplied by only three spinal segments, so there is a wide range of overlapping in the area of distribution by them. Because of this reason the innervations of the dorsal and palmar surface of the hand has the chance to have various pattern of innervation to those areas. Also, the previous studies showed that various range of variation in the cutaneous innervation of dorsum of the hand and digits. Sometime dorsum of hand is completely supplied by the dorsal branch of radial nerve; there is no involvement of ulnar nerve [1-5]. One study showed that there are four types of communications between the dorsal branches of the radial and ulnar nerves, but in our case there is no communication between them [7].

The types of communications:

- Higher radial to lower ulnar type.
- Higher ulnar to lower radial type.
- Horizontal between radial and ulnar type [Single and Multiple].

Conclusion

The detailed knowledge of the anatomy of the cutaneous nerve supply to the dorsal surface of the hand is valuable information. Because, the surgical access to the wrist is often obtained via the dorsal skin, it would be helpful particularly to determine the area where surgical incisions would not injure underlying nerves [8]. Great care must be taken when using 1 - 2 portals for the wrist arthroscopy and we suggest that making a skin incision only for the 1 - 2 portals and then using blunt dissection is to help prevent the injury to the superficial branch of radial nerve. Therefore, both the normal and abnormal anatomy of the region should be well known for accurate diagnostic interpretation and therapeutic intervention.

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