Case report

A CASE OF DISTAL ULNAR NERVE VARIATION – PRESENCE OF SENSORY LOOP AROUND THE HOOK OF THE HAMATE BONE

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INTRODUCTION

Ulnar nerve variations in the wrist are rare. A study undertaken by Dodds et al (1990) to determine the frequency of variations involving the anatomy of Guyon's canal in a series of 58 wrist dissections revealed a 22.4% incidence of anomalous muscles and only a 1.7% incidence of anomalous nerve paths, pointing to the conclusion that aberrant branching of the ulnar nerve in this area is uncommon. These anatomical variations may be related to nerve compression syndromes (Aguiar et al, 2001; Haase, 2010; Yasen, 2012), that can cause pain in the hand and hypothenar region. Other possible causes for such pain could be neuritis (Osborne, 1959; Moffat, 1964), trauma on the ulnar artery (Ablett and Hackett, 2008) or chronic overuse injury (Helal, 1978; Chuckpaiwong and Har Mooongroj, 2009). Knowledge of these anatomical variants of the nerves in the hand is crucial for successful surgical procedures. Herewith, we present a case with variation in the ulnar nerve at the wrist and discuss its possible clinical significance.

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Figure 1 - Photograph of the right wrist and hand showing the aberrant neural loop (arrowheads). UN, ulnar nerve; MN, median nerve; UA, ulnar artery; SPA, superficial palmar arch; PA, palmar aponeurosis; PB, palmaris brevis; PL, palmaris longus; FCU, flexor carpi ulnaris; FCR, flexor carpi radialis; FPB, flexor pollicis brevis; FR, flexor retinaculum; HH – hook of the hamate bone; P, pisiform bone.
CASE REPORT

During the routine anatomical dissection of the right hand of a 67-year-old caucasian male cadaver an interesting variation of the ulnar nerve was found. After entering the palm of the hand through Guyon's canal the palmar branch of the ulnar nerve bifurcated into the deep motor branch and the superficial sensory branch. The deep motor branch continued on its usual route, while the superficial branch showed significant variation in its path. The superficial branch bifurcated into a medial and a lateral part. The medial part continued as usual over the hamate bone, while the lateral part passed through the fibers of the flexor retinaculum and reunited with the medial part forming a loop around the hook of the hamate bone (Figure 1). The medial part of this loop gave off the proper palmar digital nerve to the medial side of the pinkie finger. The reunited medial and lateral parts of the loop extended into the common palmar digital nerve to the adjoining sides of the pinkie and ring fingers and a small communicating branch to the median nerve.

DISCUSSION

The distal ulnar tunnel, also called Guyon's canal, is a space at the wrist between flexor retinaculum and the palmar carpal ligament, which runs between the pisiform bone and the hamate bone, containing the ulnar neurovascular bundle. This is an occasional site for ulnar nerve entrapment (Standring, 2005). The ulnar nerve may be constricted anywhere along the course of Guyon's canal. Compression on the ulnar nerve can cause sensory-motor, only motor, or only sensory loss (Shea and McClain, 1969). Causes for harm of the ulnar nerve could be anomalous muscles (Hill et al, 2006; Ogun et al, 2007; Georgiev and Jelev, 2011; Lokanathan et al, 2014), lipoma (Rohilla et al, 2009), ganglion cyst (Elias et al, 2001; Chan et al, 2008; Pearce et al, 2009), osteoblastoma (Ayan and Serinsöz, 2014) and variant ulnar artery (Banasik et al, 2011). The aberrant path of this nerve may cause Guyon's canal syndrome as described in some clinical and anatomical reports. Fenning (1965) described a passing of the deep branch of the ulnar nerve beneath an abnormally displaced hook of the hamate causing a neuroma resulting in paralysis and muscle atrophy. A study by Lassa and Shrewsbury (1975) revealed a variant neural loop formed by the deep (motor) branch of the ulnar nerve. Olave et al (1999) have reported a case similar to our anatomical findings and they also suggested the importance during carpal tunnel decompression surgery. Musthyala and Jones (2005) presented a surgical case of a patient with an anomalous neural loop of the ulnar nerve at the wrist. Symptoms where directly related to the presence of the loop. Our case suggests a possible pure sensory loss in the respective ulnar nerve area. Knowledge of this rare nerve variation is important because of the possible predisposition to compression. Additionally, the nerve can also be harmed during surgical incisions of the flexor retinaculum for carpal tunnel release and hamate bone fractures, so insight is essential for gratifying surgical results.

REFERENCES


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