

Case Report

Co-existence of Riche-Cannieu communications and Berretinni communications

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ABSTRACT

Median nerve is formed by union of lateral and medial roots arising from the corresponding cords of the brachial plexus. Ulnar nerve arises from the medial cord of brachial plexus itself. Only few communications between the median and ulnar nerve have been reported and described in the available literature. During routine dissection of the upper limb of a male cadaver for teaching undergraduate medical students, a variation was observed in the course of median nerve and ulnar nerve communications in palm. A very rare communication was found in which there is superficial and deep communication between ulnar and median nerve was observed only in one male cadaver (1.25%). This type of communication was not found in any other cadaver so far. This dual ansa formation between branches of ulnar and median nerve by communicating branches at superficial and deep levels in palm is rare to observe in which there is co-existence of Berretinni Communications and Riche-Cannieu Communications is found in one hand only.

Keywords: Median nerve, Ulnar nerve, Communications

INTRODUCTION

Median nerve (MN) is formed by union of lateral and medial roots arising from corresponding cords of brachial plexus. The nerve enters the hand by passing deep to the flexor retinaculum. It supplies thenar muscles and 1st & 2nd lumbrical. It ends by dividing into a variable number of palmar digital branches that subdivide so that ultimately seven proper palmar digital nerves are formed for supplying each side (medial and lateral) for the thumb, the index and the middle finger; and for the lateral half of ring finger. Ulnar nerve (UN) arises from the medial cord of brachial plexus. The nerve enters the hand by passing between the superficial and deep layers of flexor retinaculum (FR) running lateral to pisiform bone and divides into superficial and deep terminal branches. The superficial terminal branch divides into two palmar digital branches- one for medial side of little finger and other for the contiguous side of ring and little fingers. The deep terminal branch, after supplying to hypothenar

muscles, runs transversely across palm along with deep palmar arch and supplies the palmar and dorsal interossei of hand, 3rd & 4th lumbrical and ends by supplying adductor pollicis and frequently flexor pollicis brevis.¹

Few communicating branches between median and ulnar nerve has been reported and described in literature. In the forearm, communicating branch may arise from the median nerve and join to the ulnar nerve, called as Martin Gruber Communications. It may arise from the ulnar nerve and join to the median nerve, known as Reverse Martin Gruber Communications or Marinacci Communication. Riche-Cannieu Communications (RCA) occurs in palm between the recurrent branch of median nerve and the deep branch of ulnar nerve. Berretinni Communications (BA) is the communicating branch between common digital nerves that arise from the ulnar and median nerves in the palmar surface of hand. It is also known as Rami Communicans or Superficial Communicating Branch. Connection between median and

ulnar nerve can cause an alteration in the clinical symptomatology especially in patients who has the carpal tunnel syndrome.²⁻⁶

CASE REPORT

During routine dissection of the upper limb of an embalmed 52 years old male cadaver in the Department of anatomy, a variation was observed in the course of median nerve and ulnar nerve communications in palm. It is a rare superficial and deep communication between ulnar and median nerve, in which the course of median nerve and ulnar nerve was followed and it was found that after crossing carpal tunnel, median nerve became more superficial and broader. It is further divided into lateral ramus (LR) and medial ramus (MR).

Medial ramus further divided into 2nd and 3rd common palmar digital branches (CPDB) and supplied the adjacent sides of index, middle and ring fingers. Communication between 3rd common palmar digital branch of median nerve and 4th common palmar digital branch of ulnar nerve was observed as Berrettini Communications. It was measured to be 1.5 cm in length which was running obliquely downwards from ulnar to radial direction. Lateral ramus divided into, a proper digital branch (PDB) for the lateral side of index finger, branch to 1st lumbrical, digital branch for thumb; and a recurrent motor branch which supplied flexor pollicis brevis, abductor pollicis brevis and opponens pollicis respectively. Before supplying opponens pollicis, Recurrent Motor branch received a communicating branch from deep branch of ulnar nerve while supplying adductor pollicis as Riche Cannieu Communications.

So, there is dual ansa formation between branches of ulnar and median nerve by communicating branches at superficial and deep levels in palm. It is a rare observation to report co-existence of Berrettini Communications and Riche Cannieu Communications in one hand only.

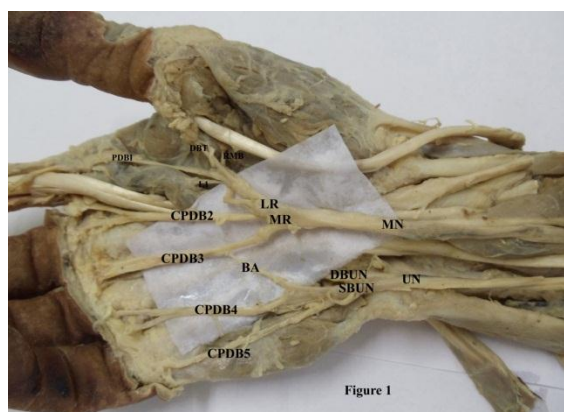


Figure 1: Showing Superficial Dissection of Palm: Median Nerve (MN) dividing into Lateral Ramus (LR) and Medial Ramus (MR). Ulnar Nerve (UN) dividing into Superficial Branch (SBUN) and Deep Branch (DBUN). Medial Ramus of Median Nerve

dividing into 2nd & 3rd Common Palmar Digital Branches (CPDB2 & CPDB3). Superficial Branch of Ulnar Nerve dividing into 4th & 5th Common Palmar Digital Branches (CPDB4 & CPDB5). Communication between 3rd Common Palmar Digital Branch (CPDB3) of Median Nerve and 4th Common Palmar Digital Branch (CPDB4) of Ulnar Nerve is observed as Berrettini Communications (BA). Lateral Ramus dividing into Proper Digital Branch for the lateral side of Index Finger (PDB1), Branch to 1st Lumbrical (L1), Digital Branch for Thumb (DBT) and Recurrent Motor Branch (RMB).

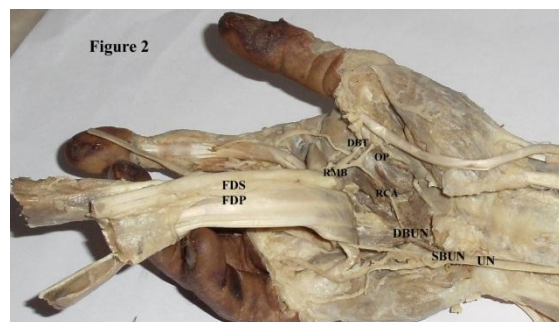


Figure 2: Showing Deep Dissection of Palm: Reflected Tendons of Flexor Digitorum Superficialis (FDS) & Flexor Digitorum Profundus (FDP). Ulnar Nerve (UN) dividing into Superficial Branch (SBUN) and Deep Branch (DBUN). Recurrent Motor Branch (RMB) of Lateral Ramus of Median Nerve is communicating with Deep Branch of Ulnar Nerve (DBUN) which is observed as Riche Cannieu Communications (RCA) before supplying Opponens Pollicis (OP).

DISCUSSION

Clinical, surgical, embryological and phylogenetic significance is associated with communication between median and ulnar nerve in forearm and palm.^{7,8} Incidence of Riche Cannieu Communications was reported to be 83.3% and 77%.^{6,9,10} Berrettini Communications is also known as “Ramus Communicans cum nervi ulnari” in terminologia Anatomica. Various studies have reported the incidence to vary significantly from 4-94%.³⁻⁵ The knowledge of the Communications important for the correct diagnosis of peripheral neuropathies and is also important in differentiation of partial and total traumatic injuries. It is of great surgical importance so as to prevent the lesions of the communicating branches during operative procedures of the upper limb. Presence of this Communications leads to deviations in the results of the motor conduction studies in the patients with carpal tunnel syndrome with unusual findings in evoked muscle potentials.

Embryological basis

Mannerfelt have suggested that the embryological reason for the communication is descent of motor axons from

one nerve crossing to other nerve and supply the territory of other nerve leading to deviation in nerve conduction and unusual findings in evoked muscle potential. It has been estimated that in the forearms of 15-31% individuals, motor axons descend from median nerve, crossing to the ulnar nerve and ultimately innervating hand muscles which are normally supplied by the ulnar nerve.⁸

CONCLUSION

It is therefore clear that the anastomoses between median and ulnar nerves are clinically significant. These connections are often suggested as causes for unusual motor losses of the muscles in the hand after peripheral neuropathies.⁹ Symptoms of carpal tunnel syndrome in patients with co-existence of Riche-Cannieu Communications and Berretinni Communications may be incomplete because of proper functionality of thenar muscles. Thus recognition of the existence of different types of Communications helps the surgeons and physicians in avoiding mistakes in the diagnosis of peripheral nerve lesions or compression neuropathies in the palm.⁶

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