



Highup Division of Median Nerve with Vascular Malformations: A case report

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Summary

On the left side, after a cleaned dissection of axillary region for brachial plexus, two roots of median nerve have been found and in between two roots there is presence of axillary artery. Musculocutaneous nerve is emerging from lateral cord of brachial plexus. Branches of this nerve are supplying coracobrachialis muscle on the upper end after piercing it. Lateral root is dividing into two branches. Medial branch is uniting with the medial root to form the main trunk of median nerve and lateral branch is uniting with the main trunk in the lower third of arm and then the reunited nerve passes between two heads of pronator teres. There are arteriovenous malformations over cubital fossa like tangles and arteriovenous fistulas at the lower end of forearm between cephalic vein and radial artery. Bluish discoloration was noted on fingernails of hand.

Similar to the left side after a cleaned dissection of the axillary region for brachial plexus on right side, two roots of median nerve have been found. Lateral root is dividing into two branches, lateral & medial. Medial branch is joining the medial root of median nerve and lateral branch joins the main trunk in the middle of the arm to continue as main nerve trunk in the middle of the arm which then passes between two heads of pronator teres muscle, gives branches before piercing. There are no arteriovenous malformations or arteriovenous fistula on the right side which is present on the left side.

Keywords: Arm, Dissection, Median, Nerve, Roots

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Introduction

Median nerve is formed in the axilla by medial and lateral root coming from medial (C8,T1) and lateral cord (C5,C6) of brachial plexus. The trunk of median nerve descends along the lateral side of brachial artery. In the middle of the arm at the level of insertion of coracobrachialis muscle it crosses the front of the artery from lateral to median side. The nerve appears in the cubital fossa and then it passes

through the two heads of the pronator teres. It is supplying them before it pierces. It appears between two groups of muscles of flexor compartment of forearm superficial and deep. It also gives some vascular branches to brachial artery. In forearm it lies undercover of fibrous arch of flexor digitorum superficialis. In the forearm it gives anterior interossei nerve accompanied by anterior interossei artery branch of common interossei artery arising from ulnar artery. Anterointerossei nerve is supplying



lateral half of flexor digitorum profundus muscle, flexor pollicis longus, flexor carpi radialis, flexor digitorum superficialis, Palmaris longus from above and pronator quadratus muscle from below, elbow joint, superior and inferior radioulnar joint, wrist joint and interossei membrane. It is supplying cutaneous branches to thenar eminence and central region of palm along with muscles of thenar eminence [1].

Sometimes there are three roots forming median nerve, two from lateral cord and one from the medial cord [3]. There may be variations in roots- three roots with two lateral roots, three roots with two medial roots, four roots with three lateral roots, two lateral roots with absent medial root, duplicate lateral root with accessory channel, lateral cord continue as lateral root with absent musculocutaneous nerve, two roots one medial and one lateral (Normal). [6]

Sometimes median nerve is formed by fusion of lateral root of lateral cord and medial root of medial cord medial to third part of axillary artery. At the junction of upper 1/3rd and lower 2/3rd of arm, median nerve crosses the brachial artery anteriorly from medial to lateral side and in the cubital fossa it remains lateral to brachial artery. Then it descends remaining on the lateral side and at the junction of upper 2/3rd and lower 1/3rd of forearm, it crosses the radial artery from lateral to medial side. There was no unusual observation in the course of median nerve in the hand. This is an unusual variation of median nerve in arm and forearm. [7]

A bifid median nerve was detected. There was no abnormality in the formation and course of the median nerve till the bifurcation 38 mm before entering the carpal tunnel. The radial part of the median nerve innervated the thumb and the radial side of the index finger as well as

the thenar muscles. The ulnar part of the nerve ensured the sensory innervation of the ulnar side of the index finger, the third finger, and the radial side of the fourth finger. The median artery was presented as a long but slender vessel which originated from the common interosseous artery, descended between the two parts of the median nerve, passed through the carpal tunnel [9]

Case Report

On the left side, after a cleaned dissection of axillary region for brachial plexus, two roots of median nerve have been found and in between two roots there is presence of axillary artery. Musculocutaneous nerve is emerging from lateral cord of brachial plexus. Branches of this nerve are supplying coracobrachialis muscle on the upper end after piercing it. Lateral root is dividing into two branches. Medial branch is uniting with the medial root to form the main trunk of median nerve and lateral branch is uniting with the main trunk in the lower third of arm and then the reunited nerve passes between two heads of pronator teres. There are arteriovenous malformations over cubital fossa like tangles and arteriovenous fistulas at the lower end of forearm between cephalic vein and radial artery. Bluish discoloration was noted on fingernails of hand.

Similar to the left side after a cleaned dissection of the axillary region for brachial plexus on right side, two roots of median nerve have been found. Lateral root is dividing into two branches, lateral & medial. Medial branch is joining the medial root of median nerve and lateral branch joins the main trunk in the middle of the arm to continue as main nerve trunk in the middle of the arm which then passes between two heads of pronator teres muscle, gives branches before piercing. There are no



arteriovenous malformations or arteriovenous fistula on the right side which is present on the left side.

Discussion

According to Sharadkumar Pralhad Sawant, Shagupta T Saikh, Rakhi Milind et.al. (2012), out of three roots two arose from lateral cord and one was coming from medial cord of brachial plexus . [2]

According to stolic R (2013) arteriovenous fistula is an end to side anastomosis which can lead to ischemia in distal extremities especially in elderly and in diabetes mellitus. It may also lead to venous hypertension & ischemic neuropathy. [5]

The present case is having same findings as Archana Srivastava, Anita Rani, Archana Rani, Pradeep kumar Sharma (2017). The course and pattern of motor supply by median nerve in forearm and palm is normal. Sometimes there may be additional lateral root of median nerve from lateral cord of brachial plexus. It arises from lateral cord, travels some distance and then pierces the coracobrachialis muscle without supplying it. After this it joins with the main trunk of median nerve in the distal third of arm. There is no variation of vascular supply in both the limbs except arteriovenous malformation and arteriovenous fistula. [4]

F Chaise and J Witvoet in 1983 found a case of high division of median nerve into two trunks of equal volumes in Hansen's disease. [8]

Conclusion

Study of variation in peripheral nerve is helpful in procedures like peripheral nerve block, electromyography, fracture management etc. It is also a helpful anatomical tool to diagnose neural crest cell defect.

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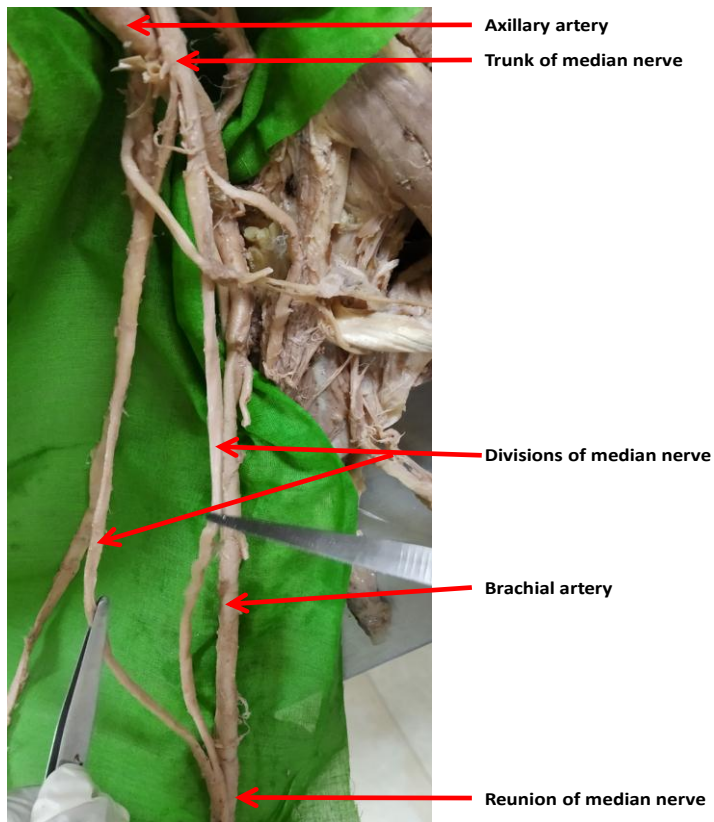


Figure 1: Left Upper Limb Photograph Showing Variations of Median Nerve

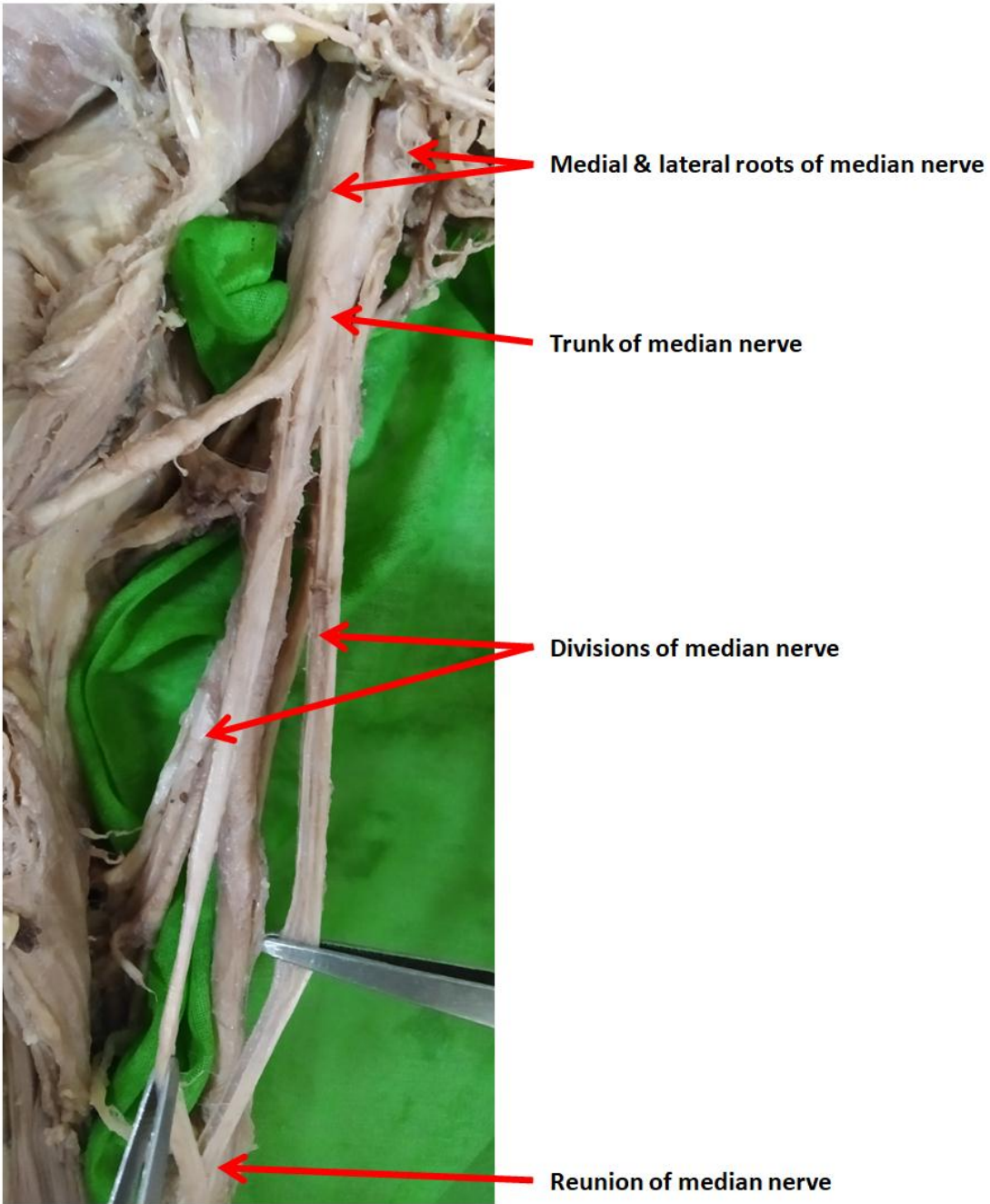


Figure 2: Right Upper Limb Photograph Showing Variations of Median Nerve