

# Absence of the Musculocutaneous Nerve with a Rare and Unusual Innervation of Median Nerve - A Case Report

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**Abstract:** *Musculocutaneous nerve is the nerve of the arm. It is one of the terminal branches of lateral cord of brachial plexus. This nerve is responsible for innervation of flexor compartment of arm and for cutaneous innervation on lateral surface of forearm. Median nerve is formed by the union of lateral and medial roots respectively arising from lateral and medial cords of brachial plexus. Median nerve doesn't give any branch in the arm. During routine dissection of a 70 - year - old male cadaver allotted for the undergraduate students of the 2020 - 2021 batch in the department of anatomy, SreeMookambika Institute of Medical Sciences, Kulasekharam, we found that the musculocutaneous nerve was absent. The formation of median nerve was found to be normal, but the lateral root of median nerve gives muscular branch to coracobrachialis. The median nerve gives two muscular branches one supplies the biceps brachii muscle and the other further divides in to two, one supplies the brachialis muscle and the other continues as lateral cutaneous nerve of forearm. The knowledge about the absence of musculocutaneous nerve and the unusual supply of median nerve should be kept in mind by the anatomist and clinicians. These observations should be considered when a high median nerve paralysis is shown to originate in the axilla or proximal arm in a patient presenting with weakness of forearm flexion and supination.*

**Keywords:** Median nerve, musculocutaneous nerve, lateral cutaneous nerve of fore arm, coracobrachialis, biceps brachii and brachialis

## 1. Introduction

Musculocutaneous nerve arises from the lateral cord of the brachial plexus with root value of C5, C6 and C7 of the spinal cord. It follows the course of the third part of the axillary artery laterally and enters the frontal aspect of the arm where it penetrates the coracobrachialis muscle. It then passes downwards and laterally between the biceps brachii and the brachialis muscles, to the lateral side of the arm; at 2 cm above the elbow it pierces the deep fascia lateral to the tendon of the biceps brachii and is continued into the forearm as the lateral cutaneous nerve of the forearm. In its course through the arm, it innervates the coracobrachialis, biceps brachii, and the greater part of the brachialis. Its terminal branch, the lateral cutaneous nerve of the forearm, supplies the sensation of the lateral side of the forearm from the elbow to the wrist. Besides, the musculocutaneous nerve also gives articular branches to the elbow joint and to the humerus. Median nerve C5, C6, C7, C8 and T1 - innervate most of the muscles of the flexor compartment of the forearm and muscles of the thenar eminence in hand. [1] It is formed by the union of the medial root (C8&T1) from the medial cord & lateral root (C5, C6 & C7) from the lateral cord of the brachial plexus. [1] At the level of insertion of coracobrachialis median nerve crosses from lateral to medial in front of the brachial artery. [1] It then descends into the cubital fossa and then into the flexor compartment of the forearm and palm.

## 2. Literature Survey

According to the literature reviewed, the absence of musculocutaneous nerve along with variation in the innervation of median nerve is extremely rare.

## 3. Methodology

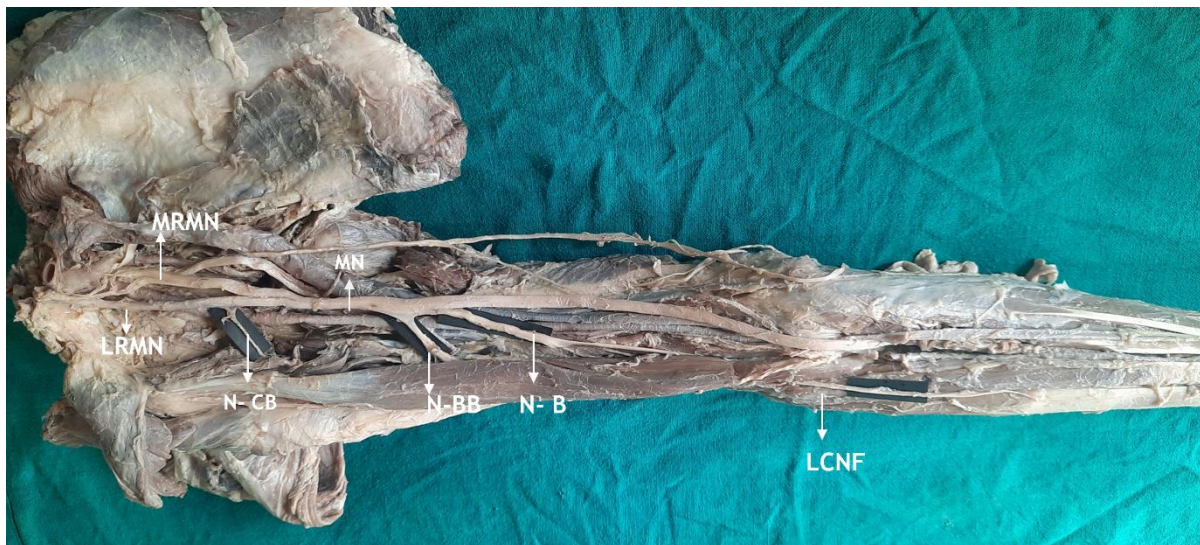
During routine dissection of upper limb in a 70 - year - old male cadaver, allotted for the undergraduate student in the Department of Anatomy, Sree Mookambika Institute of Medical Sciences, Kulasekharam, the variation was noted. Dissection of the upper limb was carried out according to the instruction given in Cunningham's Manual of Practical Anatomy Volume - 1 and we found neural variation in the anterior compartment of the right arm.

## 4. Results

**In the right upper limb:** The musculocutaneous nerve was absent, and the formation of the median nerve was found to be normal. The median nerve was formed in the upper part of the arm by union of its lateral (C5, C6 and C7) and medial roots (C8 and T1). A branch was seen to arise from the lateral root of the median nerve at 1.5 cm above the point of union of the two roots of the median nerve and 10 cm distal to the acromion process. This branch passes laterally and supplies the coracobrachialis muscle. A second branch arose from the median nerve about 4cm below the point of union of the two roots and 16 cm distal to the acromion process. It passed downwards and laterally and supplies the biceps brachii muscle. Another branch arose from the median nerve about 2cm below the second branch which then divides

further in two branches: the first muscular branch to brachialis muscles in the arm and the second cutaneous branch, which continues as the lateral cutaneous nerve of the forearm (Fig.1). The course and distribution of the median nerve beyond the cubital fossa was normal.

**In the left upper limb:** The dissection of the left upper limb was done and was found to be normal.



**Figure 1:** Dissection of axilla and arm. MN median nerve, N - CB nerve to coracobrachialis, N - BB nerve to biceps brachii, N - B nerve to brachialis, LCNF - lateral cutaneous nerve of forearm, BA brachial artery, MRMN - median root of median nerve, LRMN - lateral root of median nerve.

## 5. Discussion

In the present study, the musculocutaneous nerve was absent, and the formation of median nerve was found to be normal. The lateral root of median nerve gives muscular branch to coracobrachialis. The median nerve gives two muscular branches one supplies the biceps brachii muscle and the other further divides into two, one supplies the brachialis muscle and the other continues as lateral cutaneous nerve of forearm. In the study conducted by Kerr et al on 75 brachial plexuses, the absence of musculocutaneous nerve was found in 3 cases (1.7%) [2]. Nakatani et al [3] observed absence of the musculocutaneous nerve with innervation of the coracobrachialis, biceps brachii and brachialis muscles and the lateral border of the forearm by branches from the lateral cord of the brachial plexus. Ihunwo et al [4] reported absence of the musculocutaneous nerve bilaterally in a male cadaver where the flexors of the arm were supplied by branches from the median nerve. Similarly, Gumusburun and Adiguzel [5] reported bilateral absence of the musculocutaneous nerve in a 72 - year - - old female cadaver where the median nerve supplied the biceps brachii and brachialis muscles and gave off the lateral cutaneous nerve of the forearm. Prasada and Chaudhary [6] reported two cases of absence of the musculocutaneous nerve out of 24 upper limbs dissected (8%). Sud and Sharma [7] reported a case of absence of the musculocutaneous nerve with innervation of the coracobrachialis and biceps brachii via the median nerve. The lateral cutaneous nerve of the forearm originated from the median nerve and gave off a muscular branch to the brachialis muscle.

## 6. Conclusion

We reported unilateral variation of the median nerve with the absence of musculocutaneous nerve. Both nerves are important nerves in the anterior compartment of arm. Absence of musculocutaneous nerve and innervation of median nerve in the arm and its variant course should be born in mind while performing surgeries and clinical procedures in this region. Hence, we reported this variation.

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