

## Case Report

# Unilateral absence of musculocutaneous nerve and its clinical significance

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### ABSTRACT

Musculocutaneous nerve arises from lateral cord and supplies the muscles of front of arm and then continues as lateral cutaneous nerve of forearm. Musculocutaneous nerve has frequent variations. Nerve may be doubled or even absent. There is unilateral absence of musculocutaneous nerve in this case. Musculocutaneous nerve arises from lateral cord and supplies the muscles of front of arm and then continues as lateral cutaneous nerve of forearm. Musculocutaneous nerve has frequent variations. Nerve may be doubled or even absent. There is unilateral absence of musculocutaneous nerve in this case. Musculocutaneous nerve was seen to be absent in one case on right side. Branches arise either from lateral cord or median nerve to supply the flexor muscles of arm. Total absent musculocutaneous nerve is quite uncommon. Hence knowledge of this variation can help clinicians in understanding the cause of weakness or paralysis of flexor muscles of arm due to median nerve injury which is unusual.

**Keywords:** Flexor muscles, Lateral cutaneous nerve, Musculocutaneous nerve, Median nerve

### INTRODUCTION

Musculocutaneous nerve arises from the lateral cord (C5-C7) opposite the lower border of Pectoralis minor. It gives a branch to shoulder joint, then pierces the coracobrachialis muscle and descends laterally between biceps and brachialis to the lateral side of arm, just below the elbow it pierces the deep fascia lateral to the tendon of biceps and continues as the lateral cutaneous nerve of forearm. It supplies coracobrachialis, both heads of biceps and most of the brachialis.

The branch to coracobrachialis is given off before it enters the muscle. Branches to biceps and brachialis leave after Musculocutaneous nerve has pierced coracobrachialis.

Musculocutaneous nerve has frequent variations. It may run behind coracobrachialis or adhere to median nerve for

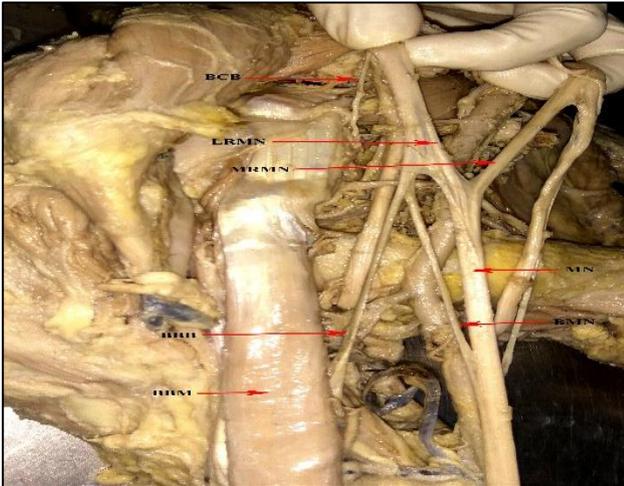
some distance and pass behind biceps. Some fibres of the median nerve may run in the musculocutaneous nerve, leaving it to join their proper trunk; less frequently the reverse occurs, and the median nerve sends a branch to musculocutaneous.<sup>1</sup>

Nerve may be doubled or even absent. Musculocutaneous nerve arises from lateral cord in 90.5% cases, from lateral and posterior cord in 4% cases, from medial cord in 2% cases while by two separate bundles from medial and lateral cords in 1.4% cases.<sup>2</sup> We describe here in detail the variation found in musculocutaneous nerve and distribution of branches to muscles and its clinical significance.

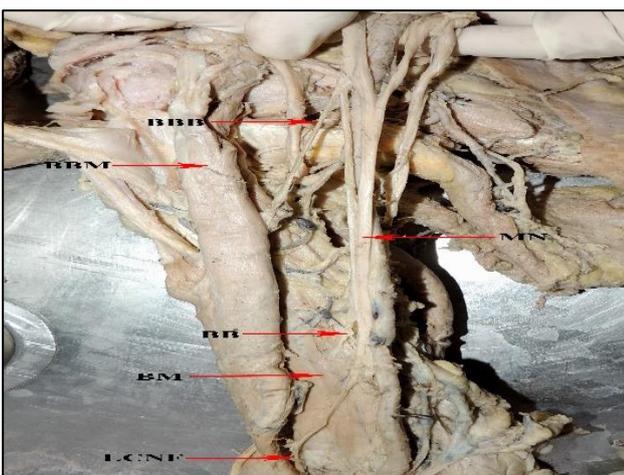
### CASE REPORT

The study was done in dissection hall during dissection of formalin fixed upper limb region of cadaver while

teaching the undergraduate students. The brachial plexus was dissected according to steps given in Cunningham's Manual and observed to see the variation from normal pattern. Observations were then noted and photographed. During dissection of upper limb, musculocutaneous nerve was seen to be absent in one cadaver. Branches arise either from lateral cord or median nerve to supply the muscles of front of forearm. In the right upper limb of a male cadaver, one branch for coracobrachialis arise from lateral cord of brachial plexus at distance of 2 cm approximately from tip of the coracoid process as shown in Figure.1.



**Figure 1: Anterior aspect of right arm region (dissected) showing nerves as Branch to coracobrachialis (BCB), lateral root of median nerve (LRMN), medial root of median nerve (MRMN), median nerve (MN), branch to biceps brachii (BBB), branch joining the median nerve (BMN) and biceps brachii muscle (BBM).**



**Figure 2: Anterior aspect of right arm region (dissected) showing nerves as branch to biceps brachii (BBB), biceps brachii muscle (BBM), median nerve (MN), branch to brachialis (BB), brachialis muscle (BM) and lateral cutaneous nerve of forearm (LCNF).**

Another branch for biceps brachii arises from lateral root of median nerve at a distance of approximately 4 cm from tip of coracoid process. Branch to biceps brachii give another branch which joins with the median nerve. Approximately at a distance of 17 cm from the tip of coracoids process, branch to brachialis arise which supplies the brachialis muscle. Branch from median nerve which becomes the lateral cutaneous nerve of forearm arise at a distance of around 18 cm from the tip of coracoid process (Figure 2). This anomaly of absent musculocutaneous nerve was found only on right side of a male cadaver. Left side was having the normal course of musculocutaneous nerve.

## DISCUSSION

Anomalies of the brachial plexus and its branches are commonly found. Musculocutaneous nerve shows frequent variations. Le Minor described five types of variations regarding the course of musculocutaneous and median nerve.<sup>3</sup> Present study coincided with the type 5 of Le Minor in which musculocutaneous nerve was absent and the entire fibres of musculocutaneous nerve pass through lateral root and fibres to the muscles supplied by musculocutaneous nerve branch out directly from median nerve. We also observed that neither the nerve nor its communicating branch pierced the coracobrachialis muscle which is according to type 3 of Venieratos classification.<sup>4</sup>

Fregnani et al and Pacholczak et al has reported absence of musculocutaneous nerve in the literature. Parchand and Patil reported complete merging of musculocutaneous nerve into median nerve and branches from median nerve innervated the muscles of anterior compartment instead of musculocutaneous nerve as observed in our study.<sup>5-7</sup> Malukar and Rathva also reported the absence of musculocutaneous nerve and its fibres pass through the median nerve.<sup>8</sup> Prasad Rao and Chaudhary reported absence of musculocutaneous nerve in 8% of upper limb specimens.<sup>9</sup> Nasr AY reported the absence of musculocutaneous nerve and all the muscles of anterior compartment were supplied by median nerve corroborative with our study.<sup>10</sup>

Failure of aggregation of all the ventral branches from the lateral cord of brachial plexus to form the musculocutaneous nerve could be the possible explanation of the absence of musculocutaneous nerve. All the segmental branches then enter through the lateral root and pass through the median nerve instead of forming musculocutaneous nerve. Branches from median nerve then supply the muscles of anterior compartment.<sup>11</sup>

## CONCLUSION

Variations of musculocutaneous and median nerve are important for surgeons and clinicians. Surgeons should consider these anatomical variations during shoulder and upper arm reconstruction procedure as chances of injury

to nerve can occur. Knowledge of this variation can help clinicians also in understanding weakness or paralysis of flexor muscles of arm due to injury to median nerve which is unusual.

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