

### Bilateral Absence of Musculocutaneous Nerve in a Cadaveric Specimen

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#### Abstract

Knowledge of the normal course and distribution of the nerves of the brachial plexus in the axilla and arm, and of its possible variations, is essential for the proper management of upper limb nerve injuries, which is a relatively common occurrence in the clinical setup. Bilateral absence of the musculocutaneous nerve was observed during routine dissection of a female cadaver. The muscles of the flexor compartment of the arm were supplied by the median nerve bilaterally.

The present case report should elucidate this variation and should aid in applying this knowledge in the clinical setup.

**Key words** – musculocutaneous nerve; cadaver; absent

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## **Introduction**

The musculocutaneous nerve arises from the lateral cord of the brachial plexus, leaving it quite high in the axilla, subsequently running obliquely downwards to enter and supply the coracobrachialis (Figure 1). It then passes downwards and enters and supplies the biceps and brachialis and becomes the lateral cutaneous nerve of the forearm (1).

In this report a case of bilateral absence of the musculocutaneous nerve observed during the routine dissection of a cadaver in the Department of Anatomy, University of Sri Jayewardenepura is presented.

## **Case Report**

During routine dissection of the upper limb by undergraduate students, absence of the musculocutaneous nerve (usually arising from the lateral cord of the brachial plexus) was observed bilaterally. The muscles of the flexor compartment of the arm i.e., biceps brachii, brachialis and coracobrachialis were instead supplied by branches of the median nerve, which arose as usual from its lateral and medial roots from the corresponding cords (Figure 2).

On the left, the median nerve formed 7cm from the outer border of the 1<sup>st</sup> rib, anterolateral to the brachial artery. It provided a branch to biceps brachii 16cm from the outer border of the 1<sup>st</sup> rib. Brachialis was supplied by a branch of the median nerve 19cm from the outer border of the 1<sup>st</sup> rib. This branch to brachialis continued as the lateral cutaneous nerve of the forearm (usually a continuation of the

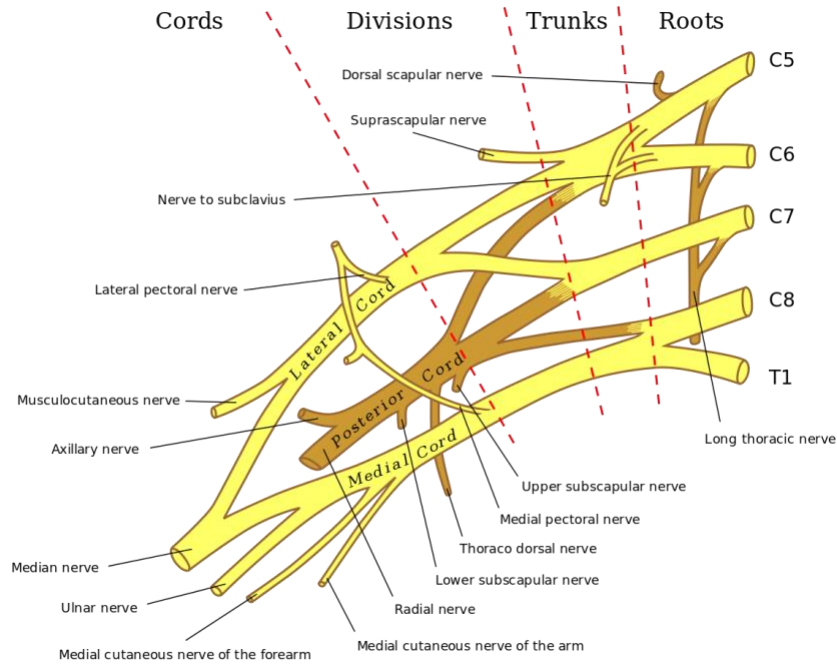
musculocutaneous nerve) lateral to the biceps tendon in the cubital fossa. The median nerve proper passed medial to the biceps tendon as usual.

On the right, the median nerve arose in a similar manner to that on the left, 4cm from the outer border of the 1<sup>st</sup> rib. It gave off 2 branches, one to the long head and the other to the short head of the biceps. The lateral cutaneous nerve of the forearm arose as a direct branch of the median nerve 19cm from the outer border of the 1<sup>st</sup> rib and passed posterior to the biceps tendon in the cubital fossa while, the median nerve passed medial to the biceps tendon.

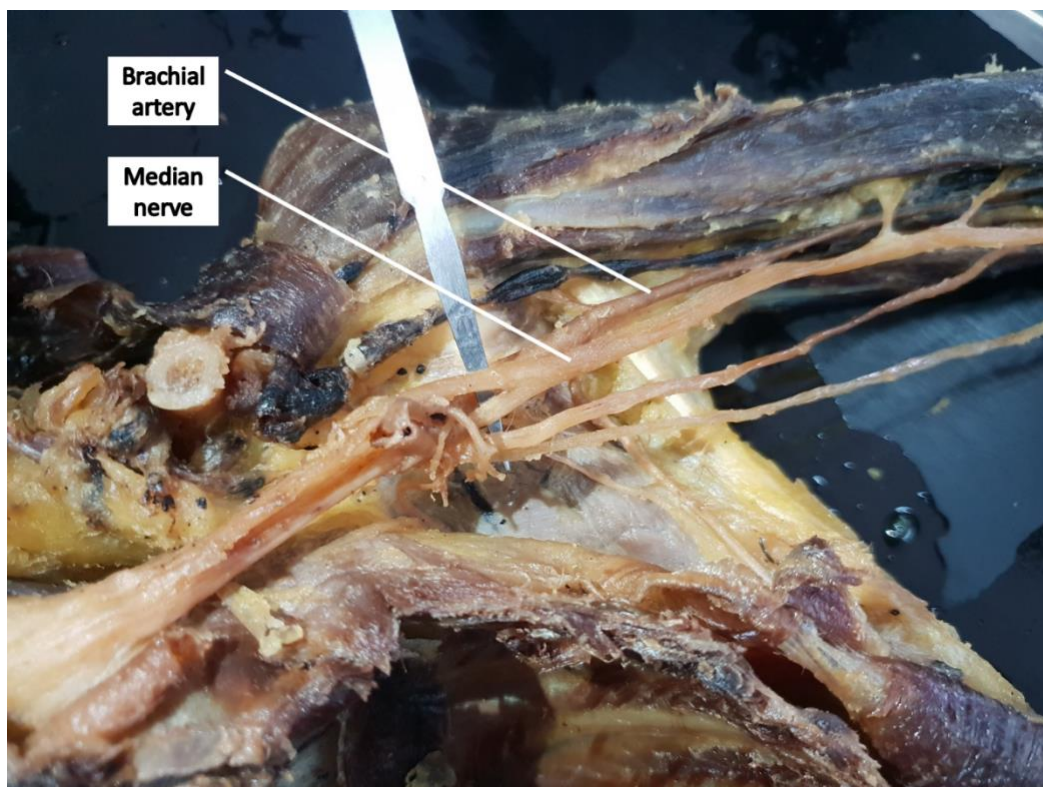
Additionally, on the left side, the medial cutaneous nerve of the arm and forearm arose as a common trunk from the medial cord, with the medial cutaneous nerve of the arm arising 15cm distal to the common trunk.

## **Discussion**

The anatomical anomalies of the nerves of the brachial plexus are of significance in the clinical diagnosis of nerve injuries. The musculocutaneous nerve usually supplies the muscles of the flexor compartment of the arm, while median nerve usually has no muscular innervation in the arm (1). However, in cases such as this, damage to the median nerve may present clinically with the inability to flex the arm, supinate the forearm and numbness/paraesthesia of the lateral aspect of the forearm, in addition to the common symptoms of loss of pronation and flexion of the forearm and paralysis of the thenar muscles,



**Figure 1:** Normal anatomy of the brachial plexus



**Figure 2:** Absence of the musculocutaneous nerve (usually arising from the lateral cord of the brachial plexus) was observed bilaterally.

which is unusual and may be misdiagnosed as an injury to the lateral cord. It would be beneficial to investigate whether this variation in the musculocutaneous nerve affects the muscle power of the arm.

Variation of origin and distribution of the musculocutaneous nerve has been described frequently in medical literature, as in the case described by Sarkar and Sahar where all the flexor muscles of the arm were supplied by the median nerve except coracobrachialis on the left, supplied by a twig from the lateral cord of the brachial plexus (2). Complete absence of the musculocutaneous nerve has also been described by Sud and Sharma (3), Sharmila Bhanu and Devi Sankar (4) and Ravishankar et al (5).

Other variations such as the unilateral absence of the musculocutaneous nerve due to the abnormal formation of the axillary artery, described by Meenakshi Sundaram (6) and multiple communications between the musculocutaneous nerve and the median nerve observed by Chauhan and Roy (7), highlight the high tendency for variation in the formation of the musculocutaneous nerve. The observation of Nasr (8) that states that in 3.3% of the cases of absent musculocutaneous nerve, all the flexor muscles of the arm are supplied by the median nerve is supportive of this study.

One possible explanation of the absence of the musculocutaneous nerve bilaterally could be due to the fact that the spinal nerve roots of the musculocutaneous nerve (C5-C7) passing through the relevant trunks and divisions of the brachial plexus, fail to aggregate and separate from the lateral cord and instead run with the

fibres of the lateral root of the median nerve (which has a similar C5-C7 origin) to be incorporated into the median nerve (9). The cause of an anomaly of this nature, specifically its embryological basis needs to be studied further and understood to predict other possible variations and for use in clinical diagnosis.

**Conflicts of Interest:** All authors wish to declare that there are no conflicts of interest.

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