

# Contribution of musculocutaneous nerve in the formation of median nerve

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## Abstract

The median nerve is formed by the union of the lateral and medial roots of median nerve. The musculocutaneous nerve is the terminal branch of the lateral cord of the brachial plexus. There are documented variations in the origins, courses and distributions of these nerves. On routine dissection of an embalmed adult Nigerian male cadaver, the musculocutaneous nerve of the left side was observed to give a contribution/communication in the formation of median nerve after both roots of median nerve have united. The right side of the brachial plexus was examined and the course and distribution of the musculocutaneous and median nerves were found to be without any communication. Variations in the origins and distributions of the brachial plexus had been documented by previous researchers. The communications between median and musculocutaneous nerves were noted to occur in different types and patterns with respect to coracobrachialis muscle. There are known variations in the formation of median nerve. Knowledge of these variations is important to the anatomist, surgeon, neurologist and anaesthetist as injury proximal to the point of communication may give rise to variable clinical presentations and manifestations.

**Key words:** Median nerve, musculocutaneous nerve, variation

## INTRODUCTION

The median nerve is usually formed by two roots, the lateral root and the medial root arising from the corresponding cords of the brachial plexus. It descends crossing the brachial artery from lateral to medial side and descends without giving any branch in the arm. The musculocutaneous nerve is the terminal branch of lateral cord of brachial plexus and it supplies the coracobrachialis muscle and then pierces it to descend in between the

biceps muscle and brachialis muscle and supplies the above muscles and descends as lateral cutaneous nerve of forearm (Sinnatamby 2006, Chitra 2007). Different patterns of communication and variations in the formation and course of the nerves of the brachial plexus have been reported by several authors (Venieratos *et al.*, 1998, Choi *et al.*, 2002). Although the reported incidence may vary, variation in median nerve and musculocutaneous nerve is indisputably one of the most common variations that may be observed in the formation and course of the nerves of the brachial plexus (Venieratos *et al.*, 1998).


The aim of this report was to highlight the contribution of musculocutaneous nerve in the formation of median nerve which is not only anatomically significant but important in clinical and surgical practice.

## CASE REPORT

During routine educational dissection of a young Nigerian male cadaver in the Department of Anatomy, College of Medicine, University of Nigeria, Enugu campus, a variation in the formation of median nerve was observed see Figure 1. The median nerve in the

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left arm was formed by three roots: The lateral and medial roots of median nerve as well as a contribution/communication from the musculocutaneous nerve. Both the lateral and medial roots joined first, anterior to the third part of the axillary artery to form the main trunk, while the musculocutaneous nerve gave out a communicating branch to join the median nerve just proximal to the entrance of the musculocutaneous nerve into coracobrachialis. Subsequent courses of both the median and musculocutaneous nerves were found to be normal. The right side of the brachial plexus was also dissected and examined, and the course and distribution of the musculocutaneous and median nerves were found to be without any communication.

## DISCUSSION

Variations and communication between the median nerve and the musculocutaneous nerve were described by many authors in the nineteenth century (Chitra 2007, Anyanwu *et al.*, 2010, Oluyemi *et al.*, 2007). Venieratos and Anagnostopoulou (1998) reported three types of communications between median and musculocutaneous nerves considering the coracobrachialis muscle as the reference point. In type one, the communication was proximal to the entrance of the musculocutaneous nerve into coracobrachialis. In type two, the communication was distal to the muscle and in type three, the nerve and the communicating branch did not pierce the muscle. In our present report, the musculocutaneous nerve sent out a communicating branch to the main trunk of median nerve before piercing the coracobrachialis muscle. This therefore fits in into type one of the report presented by Venieratos and Anagnostopoulou (1998). In the most recent observations recorded by Choi *et al.*, (2002) such communications have been broadly classified into three patterns. In pattern 1, the two nerves are fused. In pattern 2, there was one communicating branch between the musculocutaneous nerve and the median nerve. In pattern 3, two connecting branches are between the two nerves. Our observation is also in keeping with pattern 2 where there is one communicating branch between the musculocutaneous nerve and the median nerve.

Variation in median nerve and musculocutaneous nerve is indisputably one of the most common variations that may be observed in the formation and course of the nerves of the brachial plexus (Chitra 2007, Loukas *et al.*, 2005, Kerr 1918). Venieratos *et al.*, (1998) found 22 communications between the musculocutaneous and median nerves in 16 out of 79 cadavers. In six subjects they were present bilaterally. Nine of these 22 communications were proximal to the entrance of the musculocutaneous nerve into coracobrachialis. Eglseder and Goldman dissected 54 cadaver arms to determine the course and



**Figure 1:** The left axilla showing the contribution of musculocutaneous nerve in the formation of median nerve. 1-lateral cord, 2-Medial cord, 3-Medial root of median nerve, 4-Lateral root of median nerve, 5-Musculocutaneous nerve, 6-Contribution from musculocutaneous nerve, 7-Median nerve

anatomic relationships of the musculocutaneous nerve in the arm. They noticed interconnections between the musculocutaneous nerve and median nerve in 36% of dissections.

Clinical implication of this could be that injury of musculocutaneous nerve proximal to the anastomotic branch between musculocutaneous and median nerve may lead to unexpected presentation of weakness of forearm flexors and thenar muscles (Sunderland 1978).

## CONCLUSION

Variation in musculocutaneous nerve and median nerve is one of the most common variations observed in the origin, course and distribution of brachial plexus. Some of the variations are bilateral but a good number of them are unilateral, as seen in our report. Though there may not be any obvious anatomical and physiological malfunction, knowledge of these variations is important to the anatomist, radiologist, surgeon, neurologist and anaesthesiologist as it may aid in the diagnosis and treatment of some peripheral nerve injuries.

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