



AN UNUSUAL MEDIAN NERVE FORMATION; A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

The Median nerve anatomical variation is commonly encountered. During the dissection of about 65 years of formalin-fixed male cadaver at the Department of Human Anatomy at National University Faculty of Medicine for undergraduate students in 2016-2017, the left upper limb showed that the median nerve was formed by the union of the three roots. However, the third root arose from the musculocutaneous nerve inside the coracobrachialis muscle, perforating the lower part of the muscle and joining the median nerve at the middle of the arm region. Knowledge of these variations is useful clinically, especially when evaluating symptoms of upper limb trauma, and it is also useful when performing surgical approaches.

Key words: median nerve, anatomical variation, case report.

DOI: <https://dx.doi.org/10.4314/aja.v11i2.6>

INTRODUCTION

The median nerve was formed by two roots; medial (C8 & T1) and lateral (C5,6&7) cords of the brachial plexus (Moore and Dally, 2013). The medial and lateral root united together in front of the axillary artery to form the median nerve inside the axillary fossa (Last, 1994). Sargon et al., 1995, stated that the median nerve was formed by three roots.

In six out of 60 upper limbs, communication between the median and musculocutaneous nerve was present (Shruthi, 2020). Understanding of the anatomical variation of the median and musculocutaneous nerves has important clinical significance in the fields of anesthesia and surgery.

CASE PRESENTATION

During a routine for preprinting specimens for a musculoskeletal course at the Department of Human Anatomy at National University Faculty of Medicine, Sudan, the left upper extremity of an about 65-year-old male cadaver was dissected according to guidelines of the Cunningham's manual practical text book. After removing the skin and fascia, and exploring the structures beneath, Anatomical variation was encountered. The median nerve was observed receiving additional roots from the

musculocutaneous nerve in the left upper limb. When the musculocutaneous nerve passes inside the substance of the coracobrachialis muscle, an additional root emerges. The additional root perforates the distal part of the coracobrachialis muscle, and it descends downward obliquely, for about two cm, and then it joins the median nerve at the level of the middle arm, as shown in fig. (1). The median nerve in this case was formed by two lateral roots and one

medial root. On the other hand, the median was found to be anatomically normal.



Figure 1. An additional branch originates from the left musculocutaneous nerve, perforating the lower part of the coracobrachialis muscle (CBM) and joining the median nerve at the middle of the arm, representing a third root for the median. LRMN (Lateral root of median nerve), MRMN (Medial root of median nerve), RN (Radial nerve), UN (Ulnar nerve).

DISCUSSION

The Many reporters noted that anatomical variation of the median nerve was common. 33.67 % of the median nerve formation was abnormal (Samarawickrama 2017). In their analysis of median nerve formation, Behnejad et al. mentioned that in 158 cases, the median nerve was formed by 3 roots in 144 cases (91.1%), 1 root in 2 cases (1.2%), and by 4 roots in 12 cases (7.5 %). Badawoud (2003) reported that the median nerve was formed by three roots in 6.3% of subjects and by four roots in 2.1% of subjects.

The median nerve received another branch from the lateral cord of the brachial plexus (Anju, 2014). Herath et al., (2014) case report, they described how the median nerves of both sides were formed by three roots at the level of the axilla. Two roots arose from the lateral cord and the other root arose from the medial cord of the brachial plexus. The present case was similar to the finding stated that the median nerve formed by three roots, but differed by the fact which

demonstrated that the two lateral were arising from lateral cord, the second lateral root of the current case was detected coming from MCN inside the substance of the coracobrachialis muscle. According to type II of Li Minor (1992) categories lateral root of the MN pass through the MCN nerve and again return to join the median nerve in the arm. In contrast to this case, perhaps some fibers from the lateral root of median nerve may travel through the MCN and exit as additional branch which joins again with the MN. A rare case report demonstrates that a communicant branch originates from the musculocutaneous nerve, after it pierce the coracobrachialis muscle and it merges the median nerve at the level of the cubital fossa (Elisabeth et al., 2018).

In 4 out of 54 cases, the musculocutaneous nerve, after piercing the coracobrachialis muscle, gave a communicating branch to the median nerve, which was normal in its origin (Valéria P et al., 2003). The recorded variation of this case showed that the third

root of the median nerve from MCN before it perforated the coracobrachialis muscle, and in conformity that the median nerve has its usual origin. Venieratos and Anagnostopoulou (1998) reported three types of communication between median and musculocutaneous nerves. They chose the coracobrachialis muscle as a reference point. In type one, the communication was before piercing 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. The current case finding does not belong to any of the previous classifications. The formation of the median nerve from the medial and lateral cords was significantly normal at its commencement and the abnormal second communicating branch from the musculocutaneous nerve pierces the lower part of the coracobrachialis muscle and crosses obliquely for about 2 cm and joins

the median nerve. The occurrence of this type of communication may lead to confusion in the assessment of pain which is manifested in nerve injury.

CONCLUSION

Knowledge of these variations is clinically important, especially when evaluating symptoms of upper extremity trauma, and also useful when performing a surgical approach.

ACKNOWLEDGEMENTS

We would like to thank the National University directors and staff for their support during the dissection period.

CONFLICTS OF INTEREST

The authors affirmed that there are not any conflicts of interest.

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