WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 14, Issue 2, 983-988. Case Study ISSN 2277–7105

COMMUNICATION BETWEEN THE MEDIAN NERVE AND MUSCULOCUTANEOUS NERVE: A CADAVERIC STUDY

Arpitha Shetty[1]* and Kaushal Kumari Patel

[1]*Associate Professor, Department of Shareera Rachana, Adichunchanagiri Ayurvedic Medical College Hospital and Research Centre, Nagarur, Bengaluru.

[2]Assistant Professor, Department of Shareera Rachana, KJ Institute of Ayurveda and Research, Savli, Vadodara.

Article Received on
04 December 2024,

Revised on 24 Dec. 2024,
Published on 14 Jan. 2025

DOI: 10.20959/wjpr20252-35339

***Corresponding Author**
Dr. Arpitha Shetty
Associate Professor, Department of Shareera Rachana, Adichunchanagiri Ayurvedic Medical College Hospital and Research Centre, Nagarur, Bengaluru.

ABSTRACT

Background: The musculocutaneous nerve originates from the lateral cord of brachial plexus and recieves fibers from C5, C6, & C7 nerve roots, supplies the muscles of the anterior compartment of the arm. The nerve after piercing the Coracobrachialis muscle travels between the Brachialis and Biceps brachii in the arm. Median nerve comprises medial & lateral roots. Lateral root fibers derive from C8 and T1 whereas medial root fibers derives from C5, C6, and C7 nerve roots. The Median nerve does not give any branches in the arm. In the course of dissecting left upper limb of male cadaver anatomical variation in the branching pattern of Brachial plexus has been observed. A communicating branch was seen between MCN & MN. **Materials and Methods:** The present study was carried out on an adult embalmed cadaver in the department of Rachana Sharira of JSAM Nadiad, India. As the axilla and arm were dissected an anatomical variation in the branching pattern of the Brachial plexus was noted and photographs were taken. **Results:** A communicating branch from the Musculocutaneous nerve emerged after it pierces the Coraco Brachialis muscle and got attached to the median nerve. Conclusion: Understanding the variations in the brachaial plexus branches is important for upper limb surgery, post-traumatic assessments, brachial plexus blocks, and arm peripheral nerve restoration.

KEYWORDS: Musculocutaneous nerve, Median nerve, Anatomical variations, Brachial plexus.

INTRODUCTION

The ventral rami of the C5–T1 nerve roots comprise the brachial plexus, which provides nerve supply to the upper limb. Brachial plexus includes roots, trunks, divisions, cords and branches. The three cords are identifies as medial, lateral and posterior. The musculocutaneous nerve (MCN), which is derived from the lateral cord, conveys fibers from C5, C6, and C7 are transmitted by. The nerve pierces the coracobrachialis muscle passes downward across the front of the arm in between the Biceps Brachii and Brachialis; It supplies Muscles of the anterior compartment of the arm namely Coracobrachialis, Biceps Brachii and Brachialis Muscles and then continues by the name lateral cutaneous nerve of the forearm.[1,2]

The median nerve has two roots namely medial root and lateral root. Fibers from C8 and T1 are sent by the Lateral Root, which is derived from the Lateral Cord; fibers from C5, C6, and C7 are conveyed by the Medial Root, which is derived from the Medial Cord. Two roots of Median nerve unite crossing in front of 3rd part of Axillary Artery.

The Median nerve does not contribute any branches in the arm. It enters forearm between humeral and ulnar heads of Pronator Teres. It innervates Flexor compartment muscles of Forearm excluding Flexor carpi ulnaris, thenar muscles excepting adductor pollicis and lateral two lumbricals.[3]

It is not uncommon for the brachial plexus and its branches to form differently anatomically. Although such absence has been previously reported, its precise frequency is unknown. This research reported on an instance of Presence of the communicating branch between MCN & MN.

CASE REPORT

During a routine dissection of a 47-year-old adult male formalin-fixed cadaver in the Rachana Sharira department of JSAM, Nadiad, India, the current variant was noticed. The dissection of upper limbs and thorax was conducted referring the Cunningham's manual of practical anatomy guiding principles. As left arm anterior compartment was dissected, it was observed that a communication branch was present between MCN & MN. Single trunk of the

musculocutaneous nerve pierced the coracobrachialis, supplied it, gave rise to branches for Biceps Brachii after it emerges from CbM. Around 5cm after it emerged, gave rise to a muscular branch that innervated the brachialis, a branch that communicated with the median nerve, and a branch named the lateral cutaneous nerve of the forearm.

The medial and lateral roots from the respective trunk united to form Median nerve infrot of the axillary artery. The main trunk of MN found medial to brachial artery in the arm and it received a communicating branch from MCN about 4cm above the elbow. Further MN entered Cubital fossa where it was the medial most content. Rest of the course & distribution of MN in the forearm and hand was normal. The origin, course and distribution MCN was anatomically normal in the right upper limb of the same cadaver.

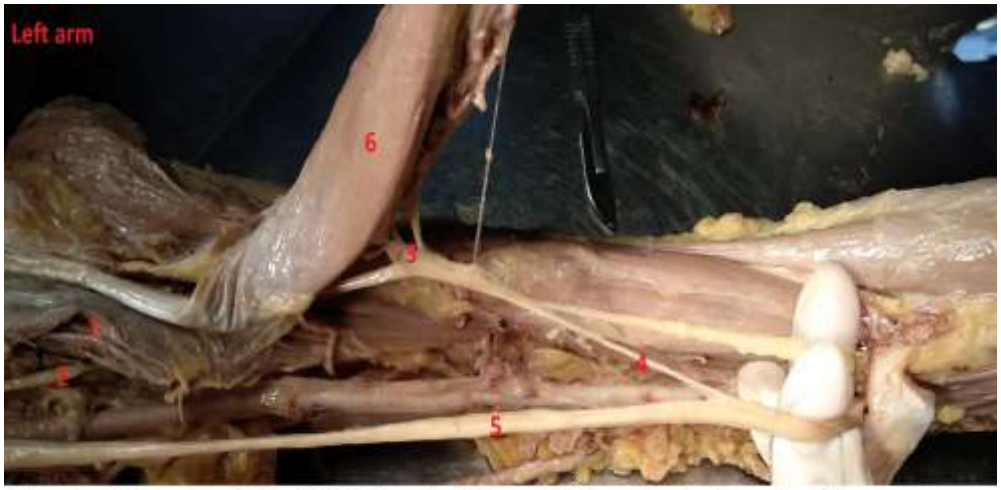

Figure 1: 1. CoracoBrachialis 2. MCN Piercing CbM 3. MCN branches to Biceps Brachii 4. communicating branch from MCN 5. Median Nerve 6. Biceps Brachii

Figure 2: 1. MCN 2. COMMUNICATING BRANCH OF MCN 3. MCN BRANCH TO BRACHIALIS 4. MN 5. Brachialis 6. Biceps Brachii

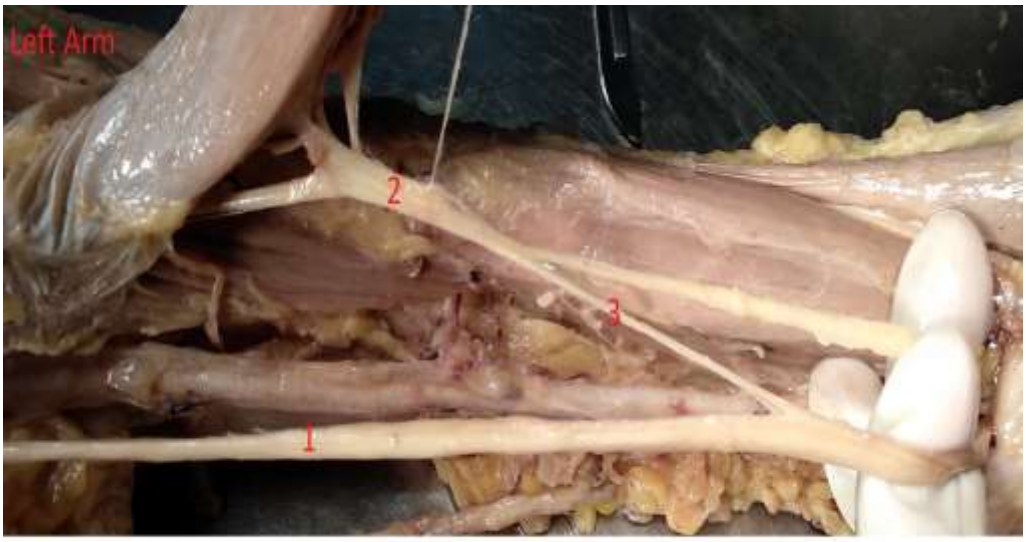

Figure 3: 1. Median Nerve 2. Musculocutaneous Nere 3. Communicating branch

DISCUSSION

Anatomical variation in the origin, course and distribution of MCN is extensive [4]. Five different types of communication have been seen between MCN and MN. The current variation is comparable to type III. It presents communications distal to the Musculocutaneous nerve's entrance into the Corachobrachialis muscle.[5]

Luis Ernesto Ballesteros reported that communicating branch was found in 19.8% cadavers, occurring bilaterally in 47.6% and unilaterally in 52.4% in his studies.[6] Choi D et al. conducted study of 138 cadavers, communicating branch was found between musculo-cutaneous and median nerve, 14.06% were bilateral and 85.94% were unilateral.[7] Reports of Budhiraja et al stated division of the MN was seen in 5.12% of the cadavers.[8] According to Rao et al Occurrence of the communications were about 33%.[9]

Altered signaling between mesenchymal and neural growth cones may lead to significant variation in nerve course.[10] Studies on variations in the brachial plexus conducted in 2003 by Abhaya, Bhardwaj, and Prakash state that the human brachial plexus is a single radicular cone in the upper limb bud that divides longitudinally into the ventral and dorsal segments. Some of the fibers that take an aberrant path as a connecting branch could be resulted by the failure of differentiation.[11]

The anatomical variation that is being discussed here has clinical implications. The surgeons while operating the arm flexor compartment may miss the presence of such communicating branch considering the classical concept where it is mentioned that the median nerve has no

any branches in the arm.[11] During peripheral nerve surgeries, particularly in nerve transfers techniques, a virtuous knowledge of the MCN-MN communications is essential. The MCN has been successfully used as a receiver nerve to the recovery of elbow flexion.[12,13]

CONCLUSION

The current case report is noteworthy because of its clinical significance .Understanding these anatomical variations can benefit diagnosing and managing the diseases and injuries of the upper limb.

REFERENCES

1. Standing S., Gray's Anatomy, Edinburgh: Churchill Livingstone, 2005; 39: 1627-847.
2. B. D Chaurasia Human Anatomy chief editor Krishna Garg, CBS publishers, New Delhi, 2017; 1, 7: 328, 56-60.
3. Haviarova, Z.; El Falougy, H.; Killingerova, A.; Matejcik, V. Variation of the median nerve course and its clinical importance. Biomed. Pap. Med. Fac. Univ. Palacky Olomouc. Czech Repub, 2009; 153: 303–306. [CrossRef] [PubMed]
4. M. Rodríguez-Niedenführ, et al., Supernumerary humeral heads of the bicepsbrachii muscle revisited, Clin. Anat, 2003; 16(3): 197–203.
5. Le Minor JM A rare variant of the median and musculocutaneous nerves in man. Arch Anat Hist Embr, 1992; 73: 33-42.
6. Ballesteros LE, Forero PL, Buitrago ER. Communication between the musculocutaneous and median nerves in the arm: an anatomical study and clinical implications. Rev Bras Ortop, 2014; 27, 50(5): 567-72. doi: 10.1016/j.rboe.2014.08.009. PMID: 26535190; PMCID: PMC4610987.
7. ChoiD, Rodriguez Niedenfuhr. M, Vazquez. T, Parkin, Sanudo JR. Patterns of connections between the musculocutaneous and median nerves in the axilla and arm. Clin Anat, 2002; 15(1): 11-7.
8. 08. Budhiraja, Rakhi Rastogi, Ajay Kumar Asthana, Priti Sinha, Atul Krishna, Vikas. Concurrent variations of median and musculocutaneous nerves and their clinical correlation a cadaveric study. Italian Journal of Anatomy and Embryology, 2011; 116(2): 67-72.
9. Rao PV, Chaudhary SC. Communication of the musculocutaneous nerve with the median nerve East Afr Med J, 2000; 77(9): 498–503.

10. FREGNANI, JHTG., MACÉA, MIM., PEREIRA, CSB., BARROS, MD., MACÉA, JR. Absence of the musculocutaneous nerve: a rare anatomical variation with possible clinical-surgical implications. Sao Paulo Medical Journal, 2008; 126, 5: 288-90.
11. Abhaya, A., Bhardwaj, R., Prakash, R. Dual origin of musculocutaneous nerve. Journal of Anatomical Society of India, 2003; 52(1): 94.
12. Merrell G.A., Barrie K.A., Katz D.L., Wolfe S.W. Results of nerve transfer techniques for restoration of shoulder and elbow function in the context of a meta-analysis of the English literature. *J Hand Surg Am*, 2001; 26(2): 303–314. [PubMed] [Google Scholar]
13. Kosugi K, Morita T, Koda M, Yamashita H. Branching pattern of the musculocutaneous nerve. 1. Case possessing normal biceps brachii. Jikeikai Med J, 1986; 33: 63–71.