International Journal of Research in Medical Sciences
Agrawal S et al. Int J Res Med Sci. 2024 Jul;12(7):2657-2659
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20241930

Case Report

The origin of musculocutaneous nerve from median nerve: a case report

Soujanya Agrawal*, Ritu Singroha, Suresh Kantha Rathee

Department of Anatomy, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana, India

Received: 09 May 2024
Revised: 05 June 2024
Accepted: 14 June 2024

***Correspondence:**
Dr. Soujanya Agrawal,
E-mail: dr.soujanyaagrawal@gmail.com

ABSTRACT

The musculocutaneous (C5-C7) is the main nerve supplying muscles of the front of the arm, i.e., the coracobrachialis both the long and the short heads of biceps brachii and the brachialis muscles, and continues as the lateral cutaneous nerve of forearm 2 cm above the elbow joint. Usually, its origin is from the lateral cord of the brachial plexus, at the pectoralis minor's lower border in the axilla. In regular dissection Bilateral variation in the origin of musculocutaneous nerve and lateral cutaneous nerve of the forearm was observed in a male cadaver. Both the musculocutaneous nerve and lateral cutaneous nerve of the forearm were found to be originating from the median nerve by a common stem. The nerve supply of muscles of the anterior compartment of the arm showed no variation. The present case was a rare anomaly and was being reported as this knowledge was of importance for surgeons, anesthetists and orthopedicians for anesthetic and other procedures.

Keywords: Musculocutaneous nerve, Median nerve, Brachial plexus, Anatomical variations, Origin musculocutaneous nerve, Nerve variation

INTRODUCTION

The brachial plexus supplies the upper extremities' soft tissues, skin and joints using the supraclavicular and infraclavicular branches. The latter branches arise from the three cords of the brachial plexus namely the posterior cord, the lateral cord and the medial cord. Among these three, the lateral cord gives rise to the musculocutaneous nerve along with the lateral pectoral nerve and the lateral half of the median nerve.[1]

The musculocutaneous nerve arises from the lateral cord (C5-C7), opposite the lower border of the pectoralis minor. This is the main nerve supplying the muscles of the front of the arm, i.e., the coracobrachialis, both the long and the short heads of biceps brachii and the brachialis muscles and continues as the lateral cutaneous nerve of the forearm 2 cm above the elbow joint. Usually, its origin is from the lateral cord of the brachial plexus, at the pectoralis minor's lower border in the axilla.[2] The normal course of the musculocutaneous nerve can usually be marked out as it pierces the coracobrachialis about 6.7 centimeters distal to its origin.[3] It usually pierces the deep fascia in the elbow present lateral to the biceps tendon.[2] The coracobrachialis muscle is supplied by this nerve before piercing it and the nerve to the other two muscles branches out approximately 14.1 centimeters distal to its origin. This nerve is rarely entrapped or affected by muscle hypertrophy though its origin, course and branching pattern variation can be seen.

CASE REPORT

A regular dissection procedure of the upper limb following guidelines of Cunningham's manual was performed in the anatomy dissection hall of PGIMS Rohtak, Haryana, India, on a 56-year-old male cadaver of Indian origin. The axillary region was dissected, cleaned,

and exposed by the author. Here brachial plexus along with all the muscles supplied by it was observed. While advancing through the routine steps of dissection it showed bilateral variation in the origin of the musculocutaneous nerve from the median nerve. The pictures of the anatomical variation were properly clicked.

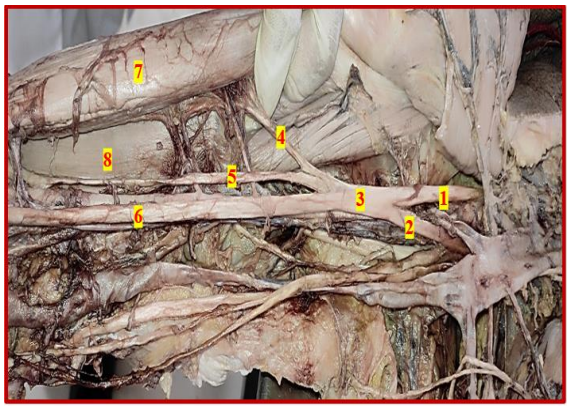

Figure 1: Right brachial plexus; 1: lateral cord; 2: medial cord; 3: median nerve; 4: musculocutaneous nerve; 5: lateral cutaneous branch of forearm; 6: continuation of median nerve; 7: biceps brachii muscle 8- brachialis muscle.

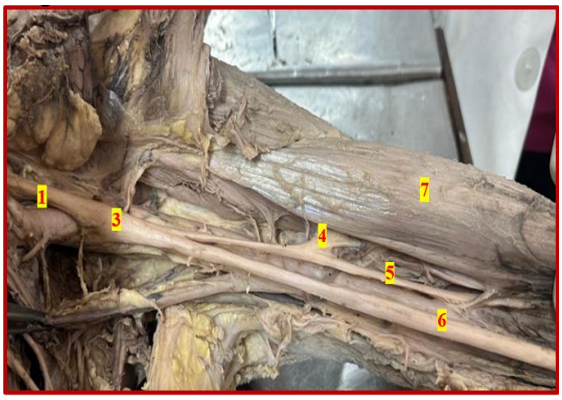

Figure 2: Left brachial plexusl 1: lateral cord; 2: medial cord; 3: median nerve; 4: musculocutaneous nerve; 5: lateral cutaneous branch of forearm; 6: continuation of median nerve; 7: biceps brachii muscle 8- brachialis muscle.

The nerve piercing coracobrachialis muscle was seen and traced back towards its origin to see the musculocutaneous nerve whose origin was from the median nerve rather than its usual origin from the lateral cord of the brachial plexus. On the right side, the origin was right after the formation of the median nerve and on the left side the origin was 0.5 cm after the median nerve origin.

On the right side, the muscles of the anterior compartment of the arm receive nerve supply from both the musculocutaneous nerve and the median nerve (Figure 1). On the left side, the nerve supply of muscles of the anterior compartment of the arm showed no variation i.e., the muscles were supplied by the musculocutaneous nerve only (Figure 2).

DISCUSSION

Another such variation is reported in the musculocutaneous nerve where muscles of the anterior compartment of the arm are supplied via the median nerve directly along with fibers from the musculocutaneous nerve.[4]

In another case the musculocutaneous nerve was present and its fibers traveled along with the median nerve without piercing the coracobrachialis muscle.[5] A male cadaver showed an absence of the musculocutaneous nerve in the left upper limb. The whole lateral cord formed the median nerve and the motor branch for the anterior compartment of the arm was from 2 branches from the middle third of the lateral cord itself.[6]

A female cadaver showed variation in the right upper limb, three roots made up of median nerve: one from the musculocutaneous nerve, one from the lateral cord, and one from the medial cord. On the medial side of the axillary artery, 2.6 cm distal to the tip of the coracoid process, a thick lateral root that sprang from the lateral cord joined the medial root to form the main trunk of the median nerve. The medial root of the median nerve continued as the medial cord of the brachial plexus, from which the ulnar nerve separated.[7]

Another male cadaver in Sao Paulo, Brazil showed the lateral fasciculus, which contributes to the genesis of the median nerve and also gave origin to the musculocutaneous nerve. The musculocutaneous nerve extended laterally for 47.38 mm, went beneath the coracobrachialis muscle for 32.73 mm, emerged on the opposite side of the muscle and continued for 55.38 mm from the point of origin to the point where it joined the musculocutaneous nerve. Near the middle of the arm and the median nerve, the musculocutaneous nerve and the median nerve joined.[8]

In a 72-year-old female cadaver there was the bilateral absence of musculocutaneous nerve and 2 branches from the lateral cord supplied coracobrachialis, the lateral root of the median nerve included musculocutaneous nerve fibers which ran into the median nerve. The biceps brachii and brachialis muscles of the arm were supplied by the median nerve which gave the lateral cutaneous nerve of the forearm.[9]

A case study was done in JJM Medical College, Karnataka, India on 40 cadaveric upper limbs, out of which the nerve had its usual origin in 87.5% of cases. The nerve was absent in 12.5%. In 92.5% of cases, the normal course was followed where the coracobrachialis was pierced by the said nerve.[10]

CONCLUSION

Variations of blood vessels can be determined preoperatively using angiography but no such study is possible for nerve variation and is only seen during operative procedures or during dissection. The present case is a rare anomaly recognized during routine dissection and is being reported as knowledge of such variations is of great importance for nerve palsy syndrome, to avoid iatrogenic damages by surgeons for regional surgeries of the axilla, flap dissection, exploratory procedures, during shoulder surgeries, as there can be injury from retractors used, anesthetists for blocks and orthopedics for open reduction and internal fixation, post-traumatic evaluation and other procedures as there can be a chance of injury to this nerve.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Guerri-Guttenberg RA, Ingolotti M. Classifying musculocutaneous nerve variations. Clin Anat. 2009;22(6):671-83.
2. Standring S. Gray's anatomy-the anatomical basis of clinical practice. 42nd ed. London: Churchill Livingstone Elsevier; 2008: 831.
3. Macchi V, Tiengo C, Porzionato A, Parenti A, Stecco C, Bassetto F, et al. Musculocutaneous nerve: histotopographic study and clinical implications. Clin Anat. 2007;20(4):400-6.
4. Chaudhary B, Gaikwad M. Anomalous origin of Musculocutaneous nerve (MCN) along with an additional nerve supply to biceps brachii & brachialis from median nerve (MN): A case report. Indian J Clin Anat Physio. 2017;4(4):419-21.
5. Jamuna M, Amudha G. A cadaveric study on the anatomic variations of the musculocutaneous nerve in the infraclavicular part of the brachial plexus. J Clin Diagnost Res. 2011;5(6):1144-7.
6. Song WC, Jung HS, Kim HJ, Shin C, Lee BY, Koh KS. A variation of the musculocutaneous nerve absent. Yonsei Med J. 2003;44(6):1110-3.
7. Chauhan R, Roy TS. Communication between the median and musculocutaneous nerve- a case report. J Anat Soc India. 2002;51(1):72-5.
8. Rios NSR, Ruiz CR, Pereira E, Andrades L, Souza CCD. Rare anatomical variation of the musculocutaneous nerve-case report. Rev Bras Ortop. 2016;51(3):366-9.
9. Gumusburun E, Adiguzel E. A variation of the brachial plexus characterized by absence of the musculocutaneous nerve a case report. Surg Radiol Anat. 2000;22(1):63-5.
10. Mavishettar S, Iddalagave S. Musculocutaneous nerve and its variations. Int J Gen Med Pharm. 2013;2(4):53-63.

Cite this article as: Agrawal S, Singroha R, Rathee SK. The origin of musculocutaneous nerve from median nerve: a case report. Int J Res Med Sci 2024;12:2657-9.