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Original Research Article

The Study of Variation in Origin of Median Nerve

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Abstract

The variations in the formation of median nerve by more than two roots are relatively common. The relation of variation of median nerve with brachialartery may have clinical implications during surgeries and nerve blocks.

Materials and Methods: 13embalmed cadavers in the Department of Anatomy, DMMC, Nagpur were dissected to note the variations in the formation and relation of Median nerve with brachial artery.

Results and Findings: Variations in the formation of median nerve and its relation with the brachial artery were observed in 2 cadavers. Variation was noted in the formation of the median nerve by more than two roots in one cadaver and in 1 cadaver, there was a variation in both formation and its relation with the brachial artery. Further course of the median nerve was normal in arm, forearm and palm. These 2 variations were unilateral in both the cadavers.

Conclusion: The knowledge of the variations is important for physicians, surgeons and anaesthetists as there may be a confusion between median nerve compression in carpal tunnel and radiculopathy in case of radiculopathy. The knowledge is beneficial for performing surgeries and giving nerve blocks especially in the axilla and arm**.**

Keywords: Median Nerve, Variations, Nerve Blocks, Median Nerve Compression.

Introduction

In the axilla, formation of median nerve is by joining of lateral and medial root of lateral cord and medial cord of brachial plexus respectively. The root value of median nerve is (C5, 6, 7, 8, T1). The medial root derived from the medial cord, carries the fibres from C8, T1 after crossing axillary artery from medial to lateral, joins the lateral root, anterior to the third part of axillary artery.[1] The median nerve runs on the lateral side of brachial artery in the arm. Thereafter it crosses the brachial artery from front to reach the medial aspect and descend medial to the artery in the arm. It enters cubital fossa and descends down in the forearm to supply muscles of the flexor compartment of forearm. The variations in the formation of median nerve by more than two roots are relatively common. The knowledge is beneficial for performing surgeries and giving nerve blocks especially in the axilla and arm**.**

Aim & Objective

To note the variations in the formation of median nerve and relation of Median nerve with brachial artery.

Materials and Methods

13 embalmed cadavers in the Department of Anatomy, DMMC, Nagpur were dissected to note the variations in the formation and relation of Median nerve with brachial artery. Total of 26 upper limbs were dissected over a period of 1 year. Variations were noted and photographed.

Results

In one cadaver, three roots were united for the formation of median nerve in left upper limb. There was a formation of the median nerve by union of medial and lateral root of median nerve. There was an extra root given off by the lateral cord which contributed for the formation of median nerve. The formation of median nerve was anterior to axillary artery. Thus, three roots were united to form a median nerve. After formation, the median nerve descended in the armmedial to the brachial artery. After giving two lateral roots by the lateral cord, for the formation of median nerve, it gave musculocutaneous nerve which pierced coracobrachialis and followed its normal course.

(Fig1)Another variation found on left upper limb where median nerve was formed by union of 1 root from medial root of median nerve and a root from lateral root of median nerve. This formation of Median nerve was 6 cm below the lower border of teres major muscle. Musculocutaneous nerve pierced the coracobrachialis and followed its normal course. Thus, there was a lower formation of median nerve which was anterior to brachial artery. Median nerve descended downwards and crossed brachial artery from its anterior aspect to lie lateral to artery and remained on lateral side in the distal arm.(Fig 2)

In both these variations median followed normal course in the forearm and palm.
These variations were unilateral.

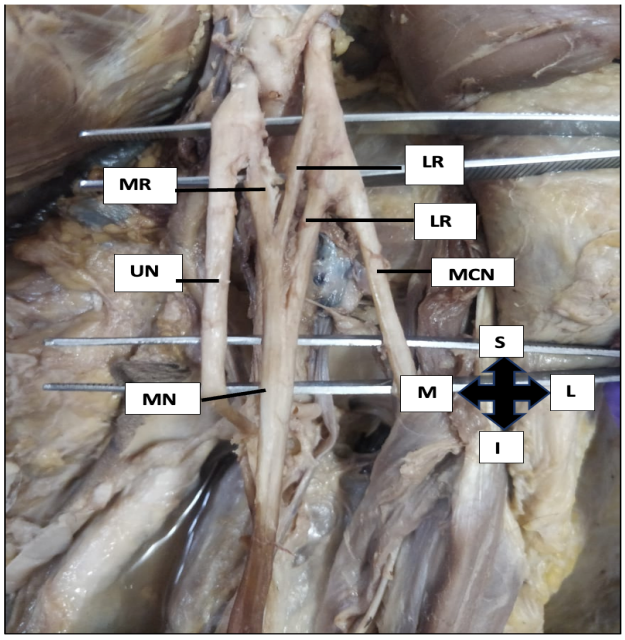

Figure 1: Variation in the formation of Median nerve (MR- Medial root of median nerve, LR- Lateral root of median nerve, MN- Median nerve, UN- Ulnar nerve, MCN- Musculocutaneous nerve, S- Superior, I- Inferior, M- Medial, L-Lateral)

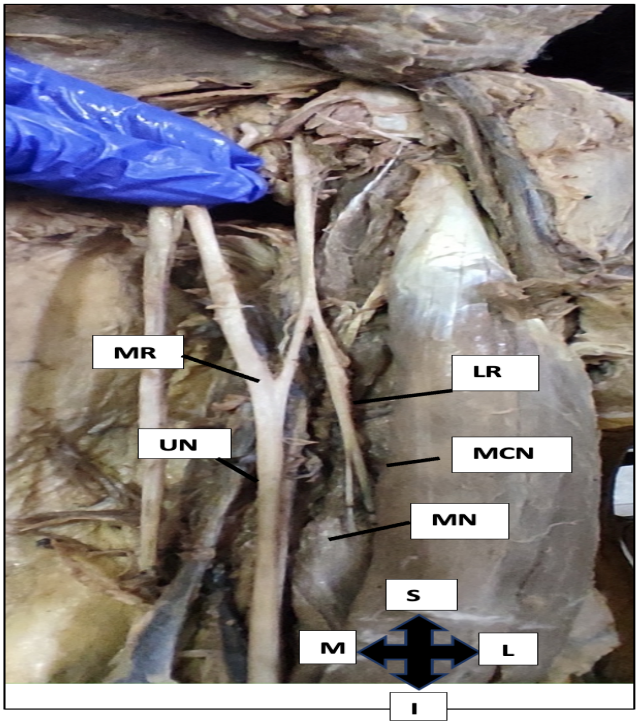

Figure 2: Variation in the formation of Median nerve (MR- Medial root of median nerve, LR- Lateral root of median nerve, MN- Median nerve, UN- Ulnar nerve, MCN- Musculocutaneous nerve, S- Superior, I- Inferior, M- Medial, L-Lateral)

Discussion

There are many variations of brachial plexus formation and its relations discussed in the textbook by Henry Hollinshed.[2] In 2009, Darwish et al. found variations in brachial plexus.[8] Formation of the radial nerve by 2 roots, absent musculocutaneous nerve on right side, median nerve formed by 4roots.The medial root of median nerve may be compressed between the axillary artery and anterior circumflex humeral artery or by the compression of median nerve by the expanding lesions of the axillary artery.[2,6] This may lead to median nerve entrapment. The knowledge of the high median nerve entrapment is important for the clinicians. In 2010, Nene et al. described the formation of median nerve by 3 roots (2 from lateral cord and 1 from medial cord).[7] The knowledge of these variations is more important in dissecting neck while performing surgeries like radical neck dissection.

Development of limbs occurs in a craniocaudal direction. There is growth cone which decides the growth towards the target organ like muscles, joints, skin. Filopodia are present on the growth cone that helps growth towards target organs. Unusual path of development of growth cone filopodia of ventral column motor axon from C5, C6, C7 spinal segments leads to variations. The target organs correctly identified by these growth cones are innervated correctly. In 2001, Uzan et al. found communicating branch between musculocutaneous and median nerve.[3] In the present case there are two roots from lateral cord in both the cadavers and one root from the medial cord. In 2009, Satyanarayan et al. found out three cases of variations of formations of median nerve which were unilateral.[4] He found out that the formation of median nerve was at a higher level on the medial side of axillary artery. In the present study, formation of median nerve was anterior to the axillary artery.

In 2007, Nayak Described how the axillary artery may get compressed between two bands of medial and lateral root of median nerve.[5] In present case 2, the median nerve crossed the brachial artery from behind in the arm. In 2003, Jahanshahi et al. described are variation where musculocutaneous nerve was absent and muscles supplied by musculocutaneous nerve are supplied by Median nerve.[6]

Conclusion

Knowledge of variation of brachial plexus and its branches its relations with axillary artery and brachial artery is important for during surgeries and anaesthetic blocks in axilla or upper limb. It is useful when axilla is dissected during various surgical, anaesthetic, orthopaedic and radiological procedures of upper limb. Knowledge is helpful in diagnosing high median nerve entrapment which may present with sensory loss, pain, paresis etc. The knowledge of such rare median nerve variations is thus important for anatomists, anaesthetists, radiologist and surgeon.

References

1. Grey Anatomy 2000. The Anatomical Basis of Medicine and Surgery .38th Edition Edinburgh, London, New York, Philadelphia, Sydney, Toronto: Churchill Livingstone. pp.1266-1272.
2. Henry Hollinshed W 1969, Anatomy for Surgeons,2nd Edition. Volume 3. New York, Evanston, San Francisco, London: Harper and Row.
3. Uzan A, Seelig LL Jr. A variation in formation of median nerve: communicating branch between muscul acutaneous and median nerve in man. Folia Morphocol (Warsz), 2001:60:99-101.
4. Satyanartayan N, Vishvakarma N, Kumar GP, Guha R, Datta AK, Sunitha P. Rare variations in the formation of median nerve –embryological basis. Nepal Med Col J. 2009;11(4):287-290.
5. Nayak S. Absence of Musculocutaneousnerve-associated with clinically important variations in the formation, course and distribution of the median nerve. Neuroanatomy. 2007;6:49-50.
6. Jahanshahi M, Moharreri AR, Golalipour MJ. AVariation of Brachial plexus: Absence of musculocutaneous nerve. MJIH 2003;6:87-88.
7. Nene AR, Gajendra KS, Sharma MVR. A rare variant formation of the median nerve. IJAV 2010;3:138-140.
8. Darwish HH, Khan MM, Alkokani MAF, Zaher WA. Bilateral variation in the formation of median nerve associated with absence of musculocutaneous nerve and radial nerve with two roots, Eur J Anat.2009;13(1):33-36.
9. Zora Haviarovaa, Hisham El Falougya, Anna-Killingerovaa, Viktor Matejcikc. Variation of the median nerve course and its clinical importance Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub. 2009;153(4):303-306.