

Study of Variations of Musculo Cutaneous Nerve in Relation to the Coraco Brachialis Muscle

S. K. Vanisree¹, Ch. Jayamma², V. Saila Kumari³, Raju Sugavasi⁴

ABSTRACT

Introduction: The muscles of upper limb are supplied by branches of brachial plexus. Musculocutaneous nerve has common variations in related to its connection with the median nerve and coracobrachialis muscle, it may be run behind the coracobrachialis muscle or stick on to it. Study was undertaken to find out the pattern of communication between musculo cutaneous and median nerve in related to coracobrachialis muscle in the anterior compartment of arm.

Material and Methods: 60 superior extremities were used to see the present variation in Kurnool Medical College, Kurnool, Andhra Pradesh, India. Dissection of upper limbs for present study was followed by standard dissection manuals and procedures on the formalin fixed cadavers.

Results: Anomalous Communication between median nerve and musculocutaneous nerve were observed in 15 limbs and the incidence was Type 1: 6.66%, Type 2: 18.3% and Type 3: 0% and total of 25%.

Conclusion: Anatomical knowledge of such possible variations has great clinical significance for the physicians and surgeons

Keywords: Communication, Coracobrachialis, Musculocutaneous nerve

given along the midline of arm and reflected skin, superficial fascia, deep fascia then retracted biceps brachii muscle laterally and noticed the communication pattern of musculo cutaneous nerve and median nerve related to coraco brachialis by normal observation method.

STATISTICAL ANALYSIS

Descriptive statistics like mean and percentages were used to interpret the data with the help of Microsoft Excel 2007.

RESULTS

Total of 60 superior extremities were dissected and observed, the results are follows. Communication between median nerve and musculocutaneous nerve were observed in 15 limbs out of 60 cases. 4 cases communication was observed proximal to the entry of musculotaneous nerve into coracobrachialis and incidence was 6.66% (Figure-1), 11 cases it was distal to the exit of musculotaneous nerve from coracobrachialis and incidence was 18.3% (Figure-2). Musculocutaneous nerve does not pierce coracobrachialis directly or through its branches in a single case and incidence was 0% (Figure-3). Incidence of present study was calculated by normal observational method.

DISCUSSION

According to Venierators and Anagnostopoulou⁴ communication between median nerve and musculocutaneous nerve was classified as 3 types, Type I: communication proximal to the entry of musculotaneous nerve into coracobrachialis, Type II: communication distal to the exit of musculotaneous nerve from coracobrachialis. Type III: musculocutaneous nerve does not pierce coracobrachialis directly or through its branches but ran alongside of the muscle and exhibited a communication between it and median nerve. Incidence of communications between median nerve and musculocutaneous nerve was reported by previous authors as follows, kosugi mortra and yamashita et al (1986) 21.8%⁵, Loukas and Aqueelah et al (2005) 63.5%⁶, choi.et.al (2002) 23.6%.⁷ According to Iwamoto et al.⁸ the communicating branch between the median and the musculocutaneous nerve, consisted of fibres arising from C5

INTRODUCTION

Musculocutaneous nerve (MCN) is derived from the C₅ C₆ C₇ roots of lateral cord of brachial plexus and pierces the coracobrachialis muscle. It supplies the muscle even before piercing it. MCN supplies both heads of the biceps brachii and medial major part of brachialis. Just below the elbow it pierces the deep fascia and extends downwards as the lateral cutaneous nerve of the forearm. Median nerve (MN) derived from 2 roots, The lateral root is the continuation of lateral cord fibres and conveys the fibres from (C₅ C₆ C₇) and medial root is derived from medial cord, carries fibres from (C₈ T₁) and joins the lateral root after crossing in front of third part of axillary artery.¹ Variations in the formation and branching pattern of brachial plexus are common and have been reported by several investigators, but communications are rare and may leads to complications. In some cases the musculocutaneous nerve does not even pierce the coracobrachialis muscle and passes into forearm for further supply.^{2,3}

MATERIAL AND METHODS

The present study was conducted on upper limbs of 30 cadavers at Department of anatomy, Kurnool government medical college, Kurnool, Andhra Pradesh, South India after obtaining proper consent from cadavers relatives. 60 upper limbs were dissected meticulously and exposed anterior compartment of arm to see the communications in related to the coraco brachialis muscle according to the guidelines described by Romanes, Cunninghams manual of practical anatomy book. Incision was

¹Assistant Professor, ²Associate Professor, ³Professor, Department of Anatomy, Kurnool medical college, Kurnool, ⁴Assistant Professor, Department of Anatomy, Fathima Institute of Medical Sciences (FIMS) Kadapa, Andhra Pradesh, India

Corresponding author: Raju Sugavasi, BPT, M.Sc Medical Anatomy, Assistant Professor, Department of Anatomy, Fathima Institute of Medical Sciences (FIMS) Kadapa, Andhra Pradesh, PIN: 516001, India.

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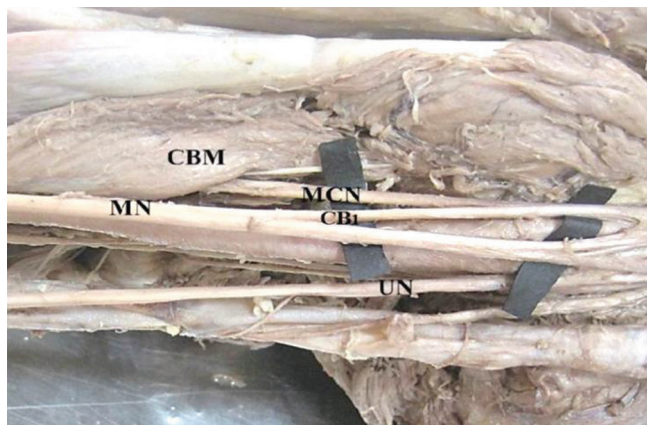


Figure-1: Shows Communication seen proximal to the entry of musculotaneous nerve into coracobrachialis (CBM – Coraco Brachialis Muscle, MN - Median Nerve, MCN – Musculocutaneous Nerve, CB- Communicating Branch, UN- Ulnar Nerve)

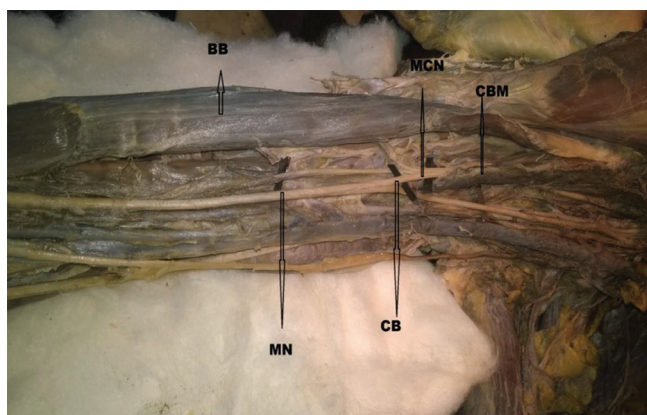


Figure-2: Shows communication is distal to the exit of musculotaneous nerve from coracobrachialis (CBM – Coraco Brachialis Muscle, MN - Median Nerve, MCN – Musculocutaneous Nerve, CB- Communicating Branch, BB- Biceps Brachii).

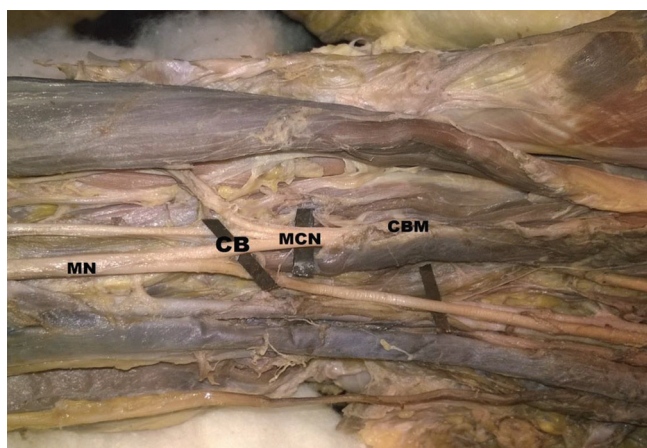


Figure-3: Shows Musculocutaneous nerve does not pierce the coracobrachialis directly or through its branches (CBM – Coraco Brachialis Muscle, MN - Median Nerve, MCN – Musculocutaneous Nerve, CB- Communicating Branch).

and C6.

Total incidence in Present study was 25%, which co relates with the study of choi et al. Sharadkumar Pralhad Sawant et al (2012)⁹ saw this variation in 30 cases out of 100 specimens. Chauhan et al in 2001¹⁰ found phylogeny and the development

of the nerves of the upper limb, for the interpretation of the nerve anomalies of the arm. Chiarapattanakom et al (1998)¹¹ suggested the reason that, limb muscles develop from the mesenchyme of local origin, while axons of spinal nerves grow distally to reach the muscles and or skin. They blamed the lack of coordination between the formation of the limb muscles and their innervations for appearance of a communicating branch. The musculocutaneous nerve may be damaged un expectedly in flap dissections of upper limbs.¹²

CONCLUSION

An injury to the musculocutaneous nerve proximal to the communication branch may lead to unpredicted appearance of weakness of forearm flexors and thenar muscles. These communications may be responsible for entrapment syndromes of musculocutaneous nerve which is a part of median nerve also passes through the coraco brachialis muscle exhibiting signs and symptoms to those seen in median nerve neuropathy. This kind of variations may be more valuable in traumatology of shoulder joint.

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REFERENCES

1. Standring S, Borley NR, Collins P, Crossman AR, Gatzoulis MA, Healy JC, et al. Gray's Anatomy. 40th Ed. London: Churchill Livingstone, 2008, pp-791–822.
2. Nakatani T, Mizukami S, Tanaka S. Three cases of the musculocutaneous nerve not perforating the coracobrachialis muscle. *Kaibogaku Zasshi*. 1997;72: 191–194.
3. Gümüşalan Y, Yazar F, Ozan H. Variant innervations of the coracobrachialis muscle and unusual course of the musculocutaneous nerve in man. *Acta Anat Nippon*. 1998; 73:269.272.
4. Venieratos D, Anagnostopoulou S. Classification of Communications between Musculocutaneous Nerve and Median Nerve. *Clin Anat*. 1998;11:327-331.
5. Kosugi K, Morita T, Koda M, Yamashita H. Branching pattern of musculocutaneous nerve. Case possessing normal biceps brachii. *Jikeikai Med J*. 1986.33:63-71.
6. Loukas M, Aqueelah H. Musculocutaneous and median nerve connections within, proximal and distal to the coracobrachialis muscle. *Folia Morphol*. 2005;64:101-8.
7. Choi D, Rodriguez-Niedenfuhr M, Vazquez T, Parkin I, Sanudo JR. Patterns of Connections Between the Musculocutaneous and Median Nerves in the Axilla and Arm. *Clinical Anatomy*. 2002;15:11–17.
8. Iwamoto S, Kimura K, Takahashi Y, Konishi M. Some aspects of the communicating branch between the musculocutaneous and median nerves in man. *Okajimas Folia Anat Jpn*. 1990;67:47.52.
9. Sharadkumar Pralhad Sawant, Shaguptha T. Shaikh. Study of anastomosis between the musculocutaneous nerve and the median nerve. *International Journal of Analytical, Pharmaceutical and Biomedical Sciences*. 2012;1:37-43.
10. Chauhan R., Roy TS. Communication between the median and musculocutaneous nerve: A case report. *Journal of Anatomical Society of India*. 2002;51:72-75.

11. Chiarapattanakom P., Leechavengvons S., Witoonchart K., Uerpairojkit C., Thuvasethakul P. Anatomy and internal topography of the musculocutaneous nerve: The nerves to the biceps and brachials muscle. *Journal of Hand Surgery*. 1998;23:250-255.
12. Ibrahim CH, Adnan E, Cem DC. Variation between Median and Musculocutaneous Nerves. *The Internet Journal of Surgery*. 2005;6:25-30.

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