International Journal of Anatomy and Research,
Int J Anat Res 2016, Vol 4(2):2498-01. ISSN 2321-4287
DOI: http://dx.doi.org/10.16965/ijar.2016.252

Case Report

MULTIPLE VARIATIONS OF LATERAL CORD OF BRACHIAL PLEXUS AND ITS BRANCHES IN THE ARM

Suma H Y *[1], Ariyanachi K [2], Anitha Nancy T [3].

*[1] Associate Professor, Department of Anatomy, JIPMER Academic Centre, JIPMER, Dhanvantrinagar, Puducherry, India.

[2] Junior Resident, Department of Anatomy, JIPMER Academic Centre, JIPMER, Dhanvantrinagar, Puducherry, India.

[3] Assisstant Professor, Department of Anatomy, Mahatma Gandhi Medical College and Research Institute, Puducherry, India.

ABSTRACT

Variants in brachial plexus and its branches are significant in everyday clinical practice. During student dissection, we came across multiple variations of lateral cord, and its branches on the left arm of a male embalmed cadaver. The lateral cord was found to pierce coracobrachialis which divided into lateral root of median nerve and musculocutaneous. There was a presence of third head of biceps brachii and also communication between median and musculocutaneous nerves. This knowledge with regard to multiple variations is important in nerve blocks, compression syndromes in the axilla and arm as well as flap surgeries. Hence the present case is being reported.

KEY WORDS: Lateral Cord, Third Head Of Biceps, Lateral Root Of Median Nerve, Musculocutaneous Nerve.

Address for Correspondence: Dr. Suma H Y, Associate Professor, Department of Anatomy, JIPMER Academic Centre, JIPMER, Dhanvantrinagar, Puducherry-605006, India.
E-Mail: suma1478@gmail.com

Access this Article online

Quick Response code

DOI: 10.16965/ijar.2016.252

Web site: International Journal of Anatomy and Research
ISSN 2321-4287
www.ijmhr.org/ijar.htm

Received: 31 May 2016 Accepted: 14 June 2016
Peer Review: 31 May 2016 Published (O): 30 June 2016
Revised: None Published (P): 30 June 2016

INTRODUCTION

Nerve variations in the upper limb are important in routine surgery, as they are more prone to injury. They also help in the interpretation of a nervous compression having unexplained clinical symptoms [1]. Anomalies related to the formation, relations and distribution of brachial plexus cords is fairly common. The ventral rami of fifth, sixth, seventh, eighth cervical nerves and first thoracic nerve to form the brachial plexus. These rami unite, divide and reunite to form trunks, divisions and the cords of brachial plexus which are grouped around second part of axillary artery [2].

Reports of lateral cord piercing coracobrachialis [2, 3]. Lateral cord is destined to supply the flexor compartment of the upper limb and the pectoral region. It gives off lateral pectoral nerve, musculocutaneous nerve and lateral root of median nerve.Lateral pectoral nerve supplies pectoralis major. Musculocutaneous nerve supplies coracobrachialis, biceps brachii and brachialis. Finally, it pierces the deep fascia at the level of elbow to continue as lateral cutaneous nerve of forearm [4].

Variations of the lateral cord are relevant during surgical explorations in the axilla and arm [2].

Biceps brachii is the key flexor as well as supinator of the elbow. Variations are common in the number of heads, their origin, insertion and nerve supply. Third head of biceps is not an infrequent observation [5].

Multiple variations in association with lateral cord piercing coracobrachialis are rare. This variation if inappropriately compressed could lead to distal neuropathy. This report highlights the relevance of knowledge of variants in the lateral cord and median nerve.

CASE REPORT

During routine dissection for medical students in our department, following variations were noted in the left upper limb of a male cadaver aged about sixty years. No such findings were observed in the right upper limb.

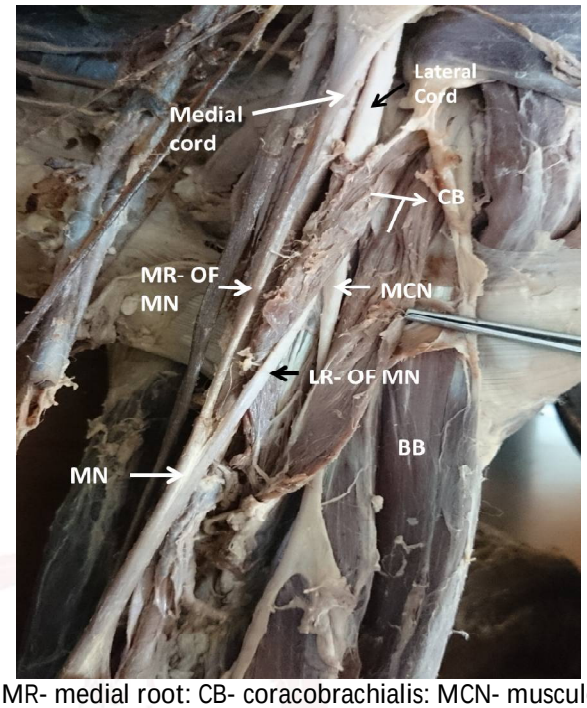
1. The lateral cord of brachial plexus was found to pierce the coracobrachialis muscle from its medial side, 85 mm below the acromion. Then, it divided into musculocutaneous nerve and lateral root of median nerve within the coracobrachialis. Lateral root of median nerve was found to emerge distally from coracobrachialis, 100 mm from acromion and joined medial root of median nerve in front of the brachial artery around middle of the arm. Further distribution of musculocutaneous nerve was normal and it terminated as the lateral cutaneous nerve of forearm.

2. The median nerve was found to give branch to brachialis muscle in addition to musculocutaneous nerve.

3. The third head of biceps brachii had muscular origin from the anteromedial surface of humerus, below the insertion of coracobrachialis. It was found medial to the short head of biceps and finally united with the main tendon of biceps brachii.

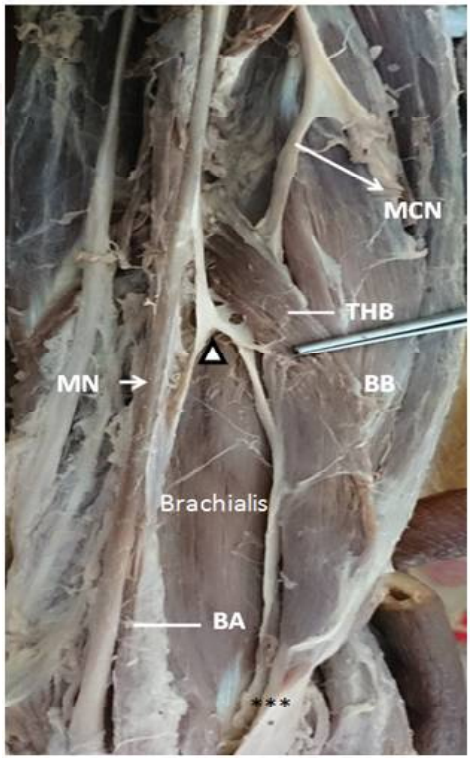
4. Posterior to the third head, presence of communication between the median and musculocutaneous nerve was noted. Here the third head was supplied by a branch from the musculocutaneous nerve.

Fig.1: Showing the lateral cord piercing the coracobrachialis in the left arm and formation of median nerve.



MR- medial root: CB- coracobrachialis: MCN- musculocutaneous nerve: BB- biceps brachii: MN- median nerve: LR- lateral root

Fig. 2: Showing the communication between median and musculocutaneous nerve, third head of biceps brachii joining the main tendon. (left arm).



MCN- musculocutaneous nerve: THB- third head of biceps: BB- biceps brachii: MN- median nerve: BA- brachial artery accompanying median nerve: Δ- communication between median and musculocutaneous nerve: ***- tendon of biceps.

DISCUSSION

The lateral cord of brachial plexus as reported in literature exhibits variation in the formation and course. About the lateral cord piercing the coracobrachialis, it is susceptible to injury when retractors are placed on coracobrachialis during arthroscopic shoulder reconstructive surgery. Since lateral cord has a variant route, nerve blocks in the upper arm may be compromised [6].

The coracobrachialis is often used in the flap surgeries after mastectomy. Following mastectomy, the deformities in the infraclavicular region and the axilla are filled using the coracobrachialis flap. For obtaining the coracobrachialis flap, anatomical knowledge and its morphological variants are crucial to the surgeon. During the procedure, structures piercing coracobrachialis are prone to injury particularly if there is an unnoticed anatomical variation [6].

Because of the variant route and distal formation of median nerve, itmay lead to confusions during surgical procedure and nerve block anesthesia. Trauma or pathology in front of arm inclusive of the coracobrachialis muscle, sensory and motor distribution of median nerve will be affected [7].

There are reports in literature stating the median and musculocutaneous nerve communication. In the present study, the communication can be classified as belonging to Type III (as per Kaur and Singla classification) i.e. all the fibers of lateral root of median nerve pass along the musculocutaneous nerve and after some distance leave it to form lateral cord [8].

The communication between median and musculocutaneous nerve was found in distal third of the arm just behind the third head of biceps. Any compression of the median nerve within the coracobrachialis or behind the third head of biceps can result in signs and symptoms similar to carpal tunnel syndrome or the pronator syndrome [9]. The lesions involving communicating nerve may give rise to the patterns of weakness that may impose difficulty in the diagnosis [10]. This variant anatomy is also of significance in diagnostic neurophysiology [11].

Presence of the third head of biceps has been reported by many authors [5]. The site of origin of third head varies, viz. capsule of the shoulder joint, coracoid process, along with the origin of pectoralis minor, or anteromedial aspect of humerus, below the insertion of deltoid. In a study by Hitendra Kumar, incidence of third head is 3.3% among Indian population. Third head of biceps as seen in the present case may increase the power of biceps in causing flexion and supination. Third head may influence the course or branching pattern of MCN, which was observed in this case.

CONCLUSION

The variations reported in the present study are of potential interest to surgeons, clinicians, and researchers. The use of sonographic investigation to screen for these variations could prove helpful in providing effective nerve blocks, in addition to discerning a differential diagnosis for clinical presentations.

ACKNOWLEDGEMENTS

We are thankful to Dr. Parkash Chand, Professor and Head, Department of Anatomy, JIPMER for his support and encouragement for the study.

Conflicts of Interests: None

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How to cite this article:
Suma H Y, Ariyanachi K, Anitha Nancy T. MULTIPLE VARIATIONS OF LATERAL CORD OF BRACHIAL PLEXUS AND ITS BRANCHES IN THE ARM. Int J Anat Res 2016;4(2):2498-2501. **DOI:** 10.16965/ijar.2016.252