International Journal of Basic and Applied Medical Sciences ISSN: 2277-2103 (Online) An Online International Journal Available at http://www.cibtech.org/jms.htm 2013 Vol. 3 (2) May-August, pp.34-36/Durgesh and Rao **Research Article** 

# MUSCULOCUTANEOUS NERVE REVISITED

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#### ABSTRACT

During routine Upper limb dissection schedule of I MBBS in the Department of Anatomy of Maharajah's Institute of Medical Sciences, Nellimarla in the 2011-2013 academic sessions, amongst the 25 cadavers dissected, a 60 year old male cadaver with the musculocutaneous nerve not piercing the coracobrachialis but giving branches from a main trunk to the upper arm muscles was identified. This variation was in the left upper limb only while the right upper limb showed a normal course of the MCN. The present study reveals an incidence of 4% of such a variation. The Musculocutaneous nerve normally a branch from the lateral cord of the Brachial Plexus subsequently pierces the coracobrachialis and supplies the muscles of the forearm. The lateral cord forms regularly from the ventral rami of 5<sup>th</sup> and 6<sup>th</sup> cervical spinal nerves. But in the present case coracobrachialis was found to be innervated by a slender direct branch from the lateral cord high up in the axilla . The dissection of the right upper limb did not show any such variation. The knowledge of such Anatomical variations would be of value to the practicing neurosurgeons, orthopedic surgeons, Anesthetist and interventional radiologists.

Key Words: Musculocutaneous Nerve, Coracobrachialis and Anatomical Variations

#### **INTRODUCTION**

The contribution of C5 -T1 cervical ventral rami leads to the Formation of brachial plexus normally. Variations in the formation of the brachial plexus have been reported by several authors and so are the variations of Musculocutaneous nerve. Three cases have been reported by Nakatani (1997) where in the musculocutaneous nerve did not pierce the corocobrachialis while Mohamad bilal delvi (2011) cautioned to be vigilant of the variations in the course of the MCN during the performance of Axillary block under the guidance of Ultrasound scan. Le minor (1990) reported a case of absence of MCN and nonunion of the medial and lateral components the median nerve and also classified the variations of the MCN. In the present case the MCN which coursed onwards to supply the biceps brachii and brachialis without piercing the corocobrachialis was of significance.

The existence of variations described may be due to altered signaling between mesenchymal cells and normal growth cones or circulatory factors at the time of gene controlled sight specific formation of the cords of the brachial plexus usually occurring during 4<sup>th</sup> to 7<sup>th</sup> week of intrauterine life. The motor axons arrive at the base of developing limb buds in the fifth week of intrauterine life Moore Persaud (2003). They mix to form growth cones which form brachial plexus in the upper limb. This advancement of growth cones is regulated by the expression of chemo attractants and repellents in a specific fashion Larson (2002). It is at this point that a variation in the nerve pattern of origin or communication can take place.

#### MATERIALS AND METHODS

The present study was done on 25 cadavers including 50 upper limbs during 2011-2013 in the Department of Anatomy, Maharajah's Institute of Medical Sciences, Nellimarla and Vizianagaram. The age of the prembalmed cadavers of either sex ranged from 30 to 60 years as per the records. Dissection of the upper limbs of both sides was performed following Cunningham's manual of practical Anatomy. Left Upper arm of a 60 year old male cadaver showed an unusual course of MCN during which it never pierced the coracobrachialis as it normally should.

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## RESULTS

The MCN arising from the lateral cord was coursing parallel to the medial border of the coracobrachialis muscle without piercing it at any point. The motor branch to the coracobrachialis was found to be arising from the lateral cord directly to the upper one third of the muscle closer to its origin. Branches to the biceps brachii and brachialis were given off by the MCN lower down in its course. The nerve then continued its onward course as the lateral cutaneous nerve of the forearm. It maintained its relative relations with the axillary artery and the median nerve by running along their lateral sides (Figure 1).



Figure 1: Showing the Musculocutaneous nerve coursing without piercing the coracobrachialis

#### DISCUSSION

Variations of the origin and branching patterns of the musculocutaneous nerve were described by many authors. Arora (2005) reported a case where MCN was found to be absent, Le Minor (1990) reported a case of absence of MCN and classified the communications of Median with the MCN in the furtherence of his work Le minor classified five types as follows: Type 1: There is no communication between the Median and Musculocutaneous nerve. Type 2: The fibers of medial root of median nerve pass through the Musculocutaneous nerve and join the Median nerve in the middle of the arm. Type 3: The lateral root fibers of medial root of median nerve pass through the Musculocutaneous nerve and after some distance, leave it to form the root of the Median nerve. Type 4: The Musculocutaneous fibres join the lateral root of the Median nerve is absent and the entire fibres of Musculocutaneous pass through lateral root and fibres to the muscles supplied by Musculocutaneous nerve branch out directly from Median nerve. However in this case there was no communication between the median nerve and MCN at any point during their course. Himabindu (2012) reported a case of MCN unusually joining the median nerve in the middle of the arm which was contributed by a small lateral root and a normal medial root.

Venieratos (1998) found existence of three types of communications between the median nerve and the MCN in relation to the coracobrachialis amongst these three variations the present case conforms with the description of III type where the MCN fails to pierce the corocobrachialis while in the type I and type II the median nerve and MCN communicate proximal to their entry of coracobrachialis and distal to it respectively.

Mohamad bilal delvi (2011) advocated caution in performing the axillary block (a type of Regional anesthetic Block) acknowledging the existence of variations in the course of MCN. Francis (2010)

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mentioned that in one fifth of the patients the MCN was found to be outside coracobrachialis hence this atypical location of the MCN should be considered to avoid the repeated Intramuscular Punctures during axillary blockade.

Nakatani (1997) described three similar cases amongst which one case showed bilateral variations of MCN not piercing the coracobrachialis while the other showed unilateral variation, the author also observed that the lateral cutaneous nerve of forearm as an offshoot of the median nerve while in the present case being reported it is a mere continuation of the MCN without piercing the coracobrachialis.

#### **Conclusion**

A comprehensive knowledge of the existence of such an atypical presentation and course of MCN would be of immense value to the anesthetist during the performance of axillary blocks, for plastic surgeons during flap dissections, for neuro-surgeons in diagnosing and treating post traumatic peripheral neuropathies and reconstructive nerve grafting following brachial plexus injuries and corocoid process grafting and shoulder arthroplasty procedures for orthopedic surgeons.

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