



Case Report

Communication between Musculocutaneous and Median Nerve –A Case Report

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ABSTRACT

Any variation in the brachial plexus has great importance to surgeons, orthopedic surgeons and anesthetics. Usually musculocutaneous nerve (MCN) does not give any communicating branch to median nerve (MN). But in routine dissection, we found that there are two communicating branches between musculocutaneous and median nerve. Many authors reported communicating branches between median and musculocutaneous nerve may be unilateral or bilateral and also tried to classify it. So the possible clinical significance, embryological basis, and comparative anatomy of communicating branch between musculocutaneous nerve and median nerve will be discussed in this paper.

KEYWORDS: Communicating branch, Median nerve, musculocutaneous nerve

INTRODUCTION

Variations in the formation of brachial plexus are common. One of the variations is communication between MCN & MN. These communicating branches have been described by many authors. Some of them had reported unilateral or bilateral or multiple communicating branches.

Normally median nerve is formed by union of lateral root from lateral cord and median root from medial cord of brachial plexus respectively. Median nerve gives only vascular branch to brachial artery in the arm region. The musculocutaneous nerve which is branch from lateral cord of brachial plexus gives muscular branches to coracobrachialis, biceps brachii and brachialis muscle and then continues as lateral cutaneous nerve of forearm.

Normally there is no communicating branch between MCN & MN. But while routine dissection we came across two communicating branches between MCN & MN. There is possibility of damaging variant muscular branches emerging from median nerve in arm by surgeons during surgical procedures in axilla. There are also possibility of nerve entrapment syndrome of upper limb by neurosurgeons and

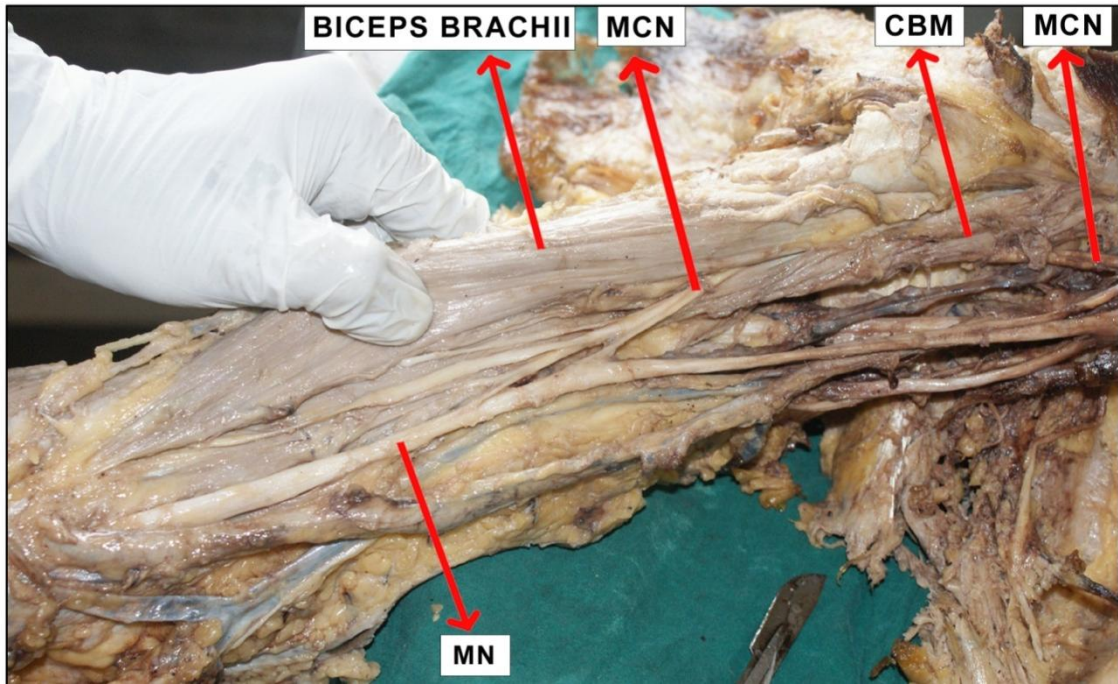
orthopedic surgeons. So knowledge of such communication between MCN & MN is important to surgeons [1].

CASE REPORT

During routine educational dissection (2012-13) of the axilla and arm region, 60 year old male cadaver was dissected and we followed the Cunningham's manual for the dissection steps.

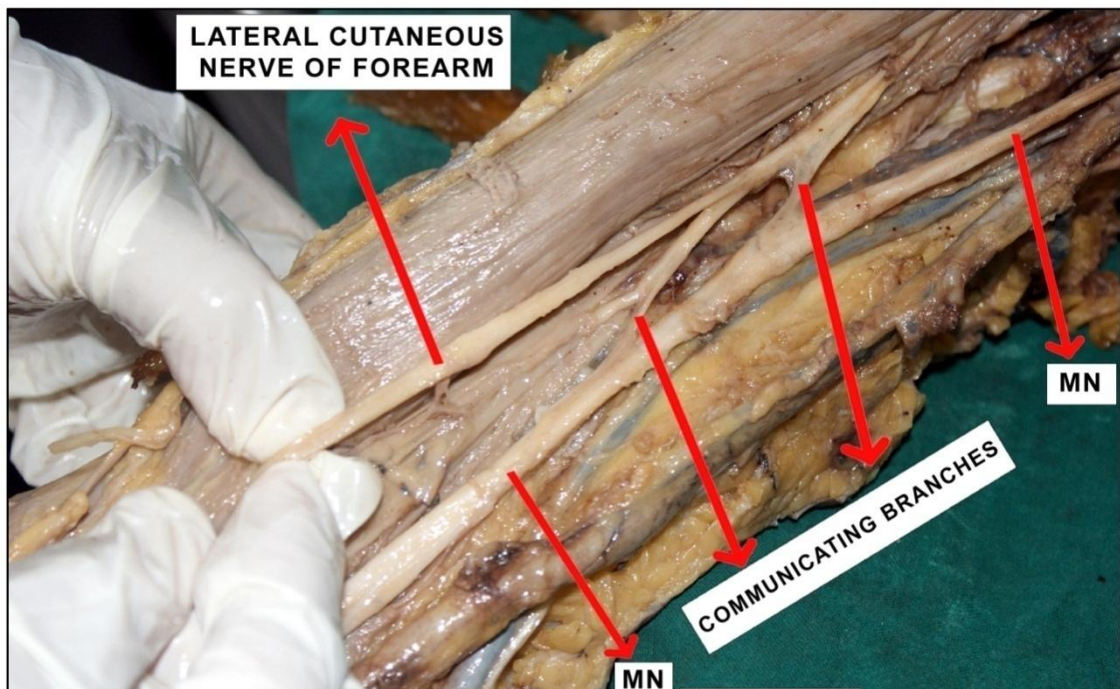
On the right hand side of arm region median nerve is formed from median root and lateral root of medial cord and lateral cord of brachial plexus respectively (**Fig 1 & 2**). Then median nerve does not give any branch in the axilla and arm region. On the same side musculocutaneous nerve, a branch of lateral cord of brachial plexus pierces the coracobrachialis muscle and before piercing it supplies the muscle (**Fig 1**). After emerging from coracobrachialis muscle it gives two communicating branches to median nerve which is variation (**Fig 2**).

Figure 1: showing nerve supply of CBM, Biceps brachi, Brachialis by MCN and formation of median nerve



*MCN--Musculocutaneous nerve, MN—Median nerve, CBM--Coracobrachialis muscle

Figure 2: Showing communicating branches between MCN & MN



*MCN--Musculocutaneous nerve, MN—Median nerve, CBM--Coracobrachialis muscle

After giving two communicating branches musculocutaneous nerve gives muscular branches to biceps brachii, brachialis muscle and continues as lateral cutaneous nerve of forearm (Fig 2). The course of both the nerves in

the forearm and hand region found to be normal. On the left side course of both the nerves found to be normal starting from their formation.

DISCUSSION

Clinical importance of such variation is seen while giving anesthetic blocks, performing surgical procedure in axillary region, interpreting tumors or traumatic nerve compression. Some authors, tried to classify the communication between MCN & MN [2, 3]. Chauhan R et al, Nene AR et al, described communication between median and musculocutaneous nerve along with the variant formation of median nerve [4, 5]. Anyanwu G.E et al studied the prevalence of communication in the Nigerian population and found that communication was always unilateral [6].

But Remya k et al and Dhanalakshimi et al found communication between median and musculocutaneous nerve on both the sides (bilateral) [7, 8]. Tomar V found asymmetrical bilateral variation in musculocutaneous and median nerve along with high branching of brachial artery [9]. Shukla et al noticed the unilateral multiple (four) communication between median and musculocutaneous nerve [10].

Some authors tried to classify the communication. Venieratos D and Anagnostopoulou S (1998) classified into three types. Type I: the communication proximal to the entrance of musculocutaneous nerve into coracobrachialis. Type II: communication distal to the muscle. Type III: the musculocutaneous nerve as well as communicating branch will not pierce the muscle [11]. According to this classification communication that we found is of **Type II**.

Choi D et al 2002 also classified variation in three main patterns: pattern I: fusion of both the nerves. Pattern II: presence of one supplementary branch between both nerves. Pattern III: two supplementary branches between both the nerves [12]. According to this classification communication that we found is of **pattern III**.

CLINICAL SIGNIFICANCE

According to Budhiraja et al prior knowledge of such variation may be helpful to surgeons during repairing trauma of the arm or treating tumors to avoid accidental injury to these nerves. According to him these variations may also explain weakness in arm flexion in patients with the thoracic outlet syndrome [13]. Kardile et al also mentioned that median nerve and its roots are in proximity with axillary vein, which is used as the landmark for axillary lymph node dissection for breast carcinoma and melanoma [14].

EMBRYOLOGICAL BASIS

The upper limb buds lie opposite the lower five cervical and upper two thoracic segments. As soon as the bud forms, the ventral primary rami of the spinal nerves penetrate into the mesenchyme of limb bud. Immediately the nerves enter the limb bud, they establish intimate contact with the differentiating mesodermal condensations and the early contact between nerve and muscle cells is a prerequisite for

their complete differentiation [15]. Chiarapattanakom et al 1998 considered that the limb muscles develop from the mesenchyme of local origin, while the 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 innervation for appearance of a communicating branch [16].

COMPARATIVE ANATOMY

Chauhan and Roy-2002 strongly considered the communication between the MCN and MN as a remnant from the phylogenetic or comparative anatomical point of view and that the ontogeny recapitulates the phylogeny, they feel that the variations seen are the result of the developmental anomaly [17]. The presence of such nerve communication are not just confined to man, studies on comparative anatomy have reported the existence of such connection in monkeys and in some apes. This suggests that communications may represent the primitive nerve supply of anterior arm muscle [18].

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