Research Article

A Variation of the Musculocutaneous and the Median Nerve Anastomosis : A Case Report in Thai Cadaver

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Abstract

This report describes a branch communicating between the musculocutaneous (MCN) and the median nerve (MN), which was detected during routine educational dissection of the right upper limb of a male cadaver in a gross anatomy class at Mahasarakham University Faculty of Medicine. After piercing the coracobrachialis muscle, the MCN runs downwards between the biceps brachii and brachialis muscles and gives branches to innervate both of these muscles. It then descends behind the brachial artery and communicates with the MN. The joining site we detected was located between the biceps brachii and brachialis muscles in the lower end of the arm, near the cubital fossa. The communicating branch also gave a filament to the pronator teres muscle. Since variations in the MCN and MN are frequent, and communicating branches between the MCN and MN are the most common, knowledge of this variation may help surgeons, anesthetists and neurologists to plan procedures at the arm, forearm and elbow following trauma or other medical problems.

Keywords: Median Nerve; Musculocutaneous Nerve; Pronator teres; Variations

Abbreviation

BA	brachial artery
BB	biceps brachii
BR	brachilis muscle
CRB	coracobrachilis
LCNF	lateral coetaneous nerve of forearm
MCN	musculocutaneous nerve
MN	median nerve
UN	ulnar nerve
PT	pronator teres

1. Introduction

The musculocutaneous nerve (MCN) is the branch from the lateral cord of the brachial plexus that conveys the fibers from C5, C6, and C7. Initially, the nerve accompanies the third part of the axillary artery, pierces the coracobrachialis muscle, and then passes across the front of the arm between the biceps brachii and brachialis muscles. As the MCN passes the coracobrachialis muscle, biceps brachii and brachialis muscles, it branches to innervate all of these muscles. The terminal branch is continuous as the lateral cutaneous nerve of the forearm supplies the lateral margin of the skin of the forearm.

Several publications have described variations in branching of the brachial plexus [1-7]. Among these, variations of the MCN and median nerve (MN), and anastomosis

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Between the two nerves are the most frequently observed [5-8]. Therefore, knowledge of anatomical variations of the MCN and MN, as well as of the peripheral nerves in the upper extremities, may help to prevent injuries during surgical and anaesthetic procedures in the region of the axilla, arm and forearm.

2. Materials and Methods

Variation in the musculocutaneous nerve was observed during routine dissection of a 64-year-old Thai male cadaver for medical students in a gross anatomy class at Mahasarakham University Faculty of Medicine. The distance from the acromion to the segment where the communicating branch was located was recorded [9]

3. Results

We observed a variation in the termination of the MCN in the right upper limb of a of 64-year-old Thai male cadaver. After piercing the coracobrachialis muscle, the MCN runs downward between the biceps brachii and brachialis muscles, innervating both muscles. It then divides into two branches, one of them descending inferolaterally behind the biceps brachii which is continuous as the lateral cutaneous nerve of the forearm. Another branch descends downward behind the brachial artery and continues to communicate with the MN. The variation we detected was a communication site located between the biceps brachii and brachialis muscles in the lower end of the arm, near the cubital fossa. The distance between the acromion and the proximal point of the communicating branch was 31.2 cm. The communicating branch also give a filament to the pronator teres muscle (Figures 1 and 2). Courses of all the other major nerves including the median, ulnar, axillary and radial nerves were unremarkable.

Figure 1. Right arm showing a communication between the musculocutaneous and median nerves. -, * communicating site.

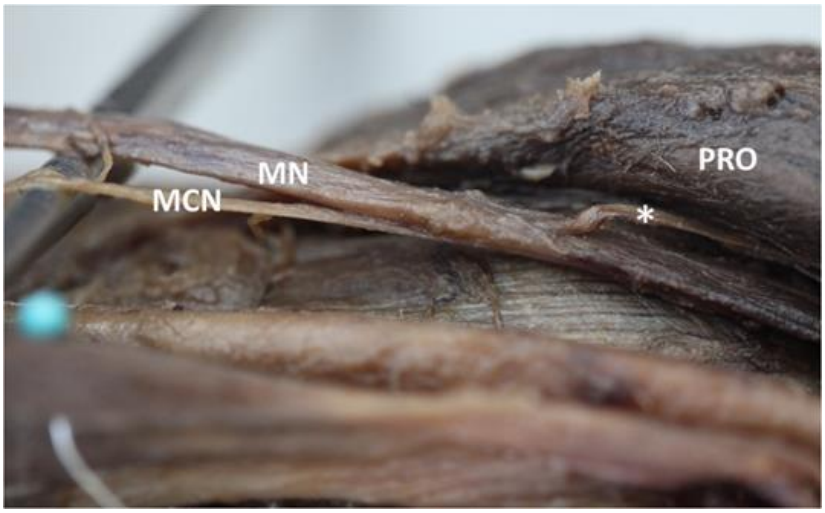

Figure 2. Communication site between the musculocutaneous and median nerves. -, * branch to pronator teres muscle.

4. Discussion

The present report describes an anatomical variation occurring at the termination of the MCN in the right upper limb of a 64-year-old male cadaver. The incidence of the MCN-MN communification has been reported in diverse population groups including Asia, Europe and America with a wide variability between 5 and 54.7% [5-7, 9, 10]. Among these, Venieratos and Anagnostopoulou [5] have classified three types of communication between the MCN and MN using the coracobrachialis muscle as a reference point. In type I, the communication is proximal to the coracobrachialis muscle. In type II, the communication is distal to the muscle. In type III, the nerve and the communicating branch do not pierce the muscle. However, Maeda et al. [10] classified the variations as follows. In type A, the communication is from the MCN to the MN. In type B, the communication is from the MN to the MCN. In type C, the communication is between the MCN and the MN, forming a loop. In type D, there is coexistence of plural types of communications between the MCN and the MN, and in type E, the MCN does not pierce the coracobrachialis. Among these types, type A was most commonly noted (4 5 % of specimen). Type A has been further divided into 5 subtypes (Figure 3) as follows. A1: After the MCN supplies branches to the brachialis, a communicating branch arises from the lateral cutaneous nerve of the forearm and descends behind or in front of the brachial artery to unite with the MN. This type was 18.8% of type A. A2a: The communications arise from the branch to the brachialis. A2b: The communication is located between the branches going to the biceps brachii and brachialis muscle. A2c: The communicating branch exits from the MCN before the biceps muscle branch. A2d: The communication arises proximal to the branch to the biceps brachii but pierces the coracobrachialis. Our present case represents type A1 because, after the MCN supplied branches to the biceps and brachialis, the communicating branch arose from the lateral cutaneous nerve of the forearm and descended behind the brachial artery to unite with the MN.

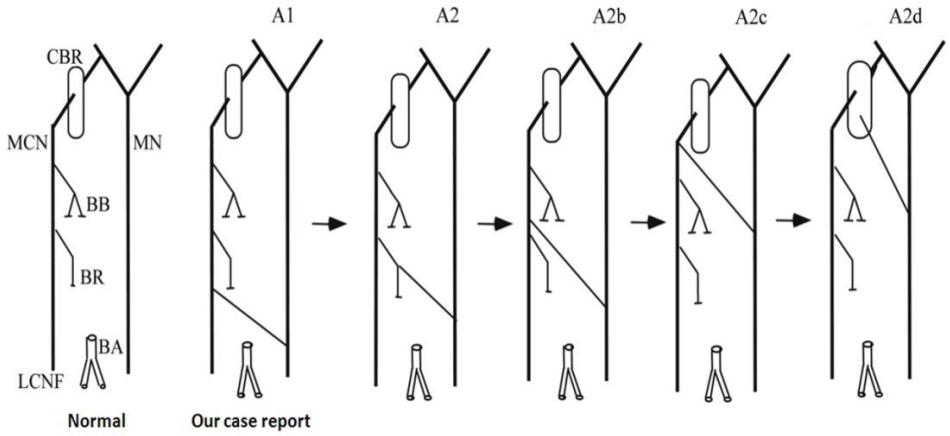

Figure 3. Schematic diagram showing type A communications between the MCN and MN, according to the Maeda et al. classification system [10], and the variation described in our case report. Modified from Maeda et al. [10].

5. Conclusion

Variations of the MCN and MN are frequent, and communicating branches between the MCN and MN are the most common. The detection and evaluation of these variations is very important during clinical examination of nerve injuries, during surgical procedures such as nerve repair, and for nerve blocks at the upper extremities in anesthetic practice. Knowledge of this variation may also explain unusual clinical symptoms. For example, injuries that affect the proximal section of the MCN before the MCN-MN communication site may lead to weakness of the forearm flexors and thenar muscles, with clinical signs comparable to those of an MN injury at the level of the arm.

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7. References

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