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Bilateral communications between the median and musculocutanous nerves after piercing the last one the coracobrachialis muscle

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SUMMARY

In the dissection of a 79-year-old Chinese male cadaver, communications were established on both sides between the median and musculocutanous nerves. The musculocutaneous nerve (mcn) was the continuation of the lateral cord. After piercing the coracobrachialis muscle, the mcn gave rise to a communicating branch which directed downwards medially and ended in the median nerve (mn) at the level of upper arm. In the left arm, the mn was formed by three roots: one medial root from the medial cord and two lateral roots from the lateral cord.

Key words: Communication – Median nerve – Musculocutaneous nerve – Variation

INTRODUCTION

Connections between different nerves in the arm are rare, but those between the median nerve (mn) and the musculocutaneous nerve (mcn) have been reported by several authors (Venieratos and Anagnostopoulou, 1998; Choi et al., 2002; Guerri-Guttenberg, 2009). The musculocutaneous-median communication is clinically important, as it could be injured during surgical procedures, and because the variation may explain unusual clinical symptoms. Venieratos and Anagnostopoulou (1998) classified communications in between the mn and the mcn considering the coracobrachialis muscle as the reference point. However, many features of the communications were not described precisely. Another classification consisting of 3 principle patterns analyzed the morphological features of the variations, and their distribution by side and gender (Choi et al., 2002).

Our study deserves special attention in literature because of the double lateral roots of mn with bilateral communications between mcn and mn in the same cadaver. The neural variation strives to caution the surgeons, orthopaedicians and anesthetists performing pain-management therapies on the upper limbs.

CASE REPORT

During the dissection of a 79-year-old Chinese male cadaver, we discovered a variant of the brachial plexus. In the right upper arm, the main trunk of mcn arose from the lateral cord of the brachial plexus. Before it pierced the coracobrachialis, the mcn supplied the muscle. There was a communication emanating from the mcn distal to the point of entry of mcn into the coracobrachialis. The communication was measured 3.2 cm in length and joined the mn at the mid - humeral shaft level. The main trunk of the mcn descended between the biceps brachii and brachialis to the lateral side of the right arm (Fig. 1a).

In the left upper arm, two lateral roots of mn

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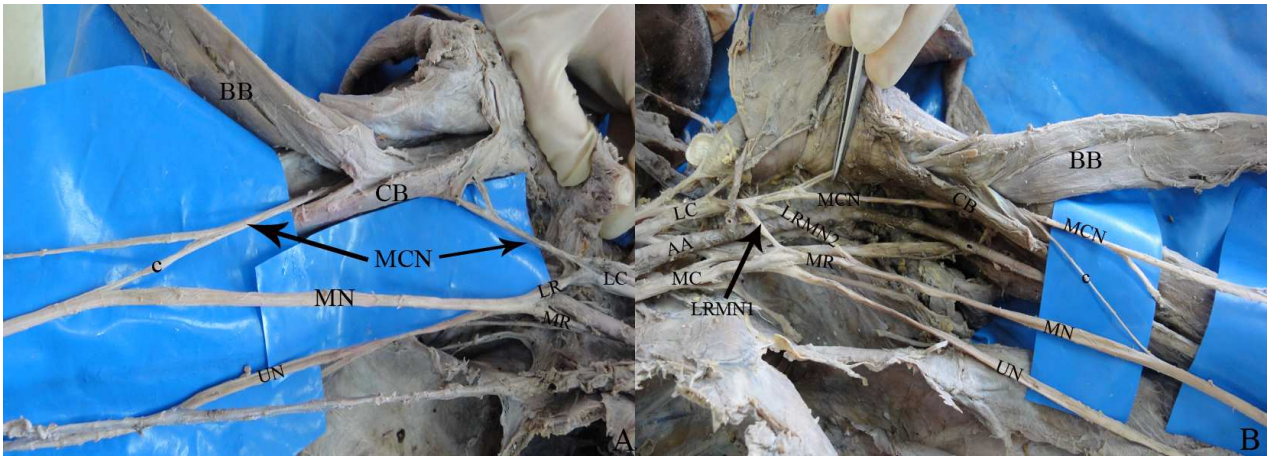

Fig. 1. Dissection of the axilla, showing the brachial plexus, its terminal branches and the communications. **(A)** Dissection of the right brachial plexus: lc, lateral cord of the brachial plexus; lr: lateral root of the median nerve; mr: medial root of the median nerve; mn: median nerve; mcn: musculocutaneous nerve; un: ulnar nerve; cb: coracobrachialis; bb: biceps brachii; c: communication between the musculocutaneous and median nerves; aa: axillary artery. **(B)** Dissection of the left brachial plexus: lc, lateral cord of the brachial plexus; mc: medial cord of the brachial plexus; lrmn1: lateral root of the median nerve 1; lrmn2: lateral root of the median nerve 2; mr: medial root of the median nerve; mn: median nerve; mcn: musculocutaneous nerve; un: ulnar nerve; cb: coracobrachialis; bb: biceps brachii; aa: axillary artery; c: communication between the musculocutaneous and median nerves.

(lrmn1 and lrmn2) were given off from the lateral cord of brachial plexus. Both of them coursed over to the medial side of the axillary artery (aa), superficial to it. The lrmn1 joined the medial root on the medial side of aa. The medial root ran downwards laterally and fused with lrmn2, so the mn was formed. Diameters of lrmn1 and lrmn2 were 0.2 mm and 0.35 mm respectively. The main trunk of mcn originated from the lateral cord of the brachial plexus. It ran laterally, supplied and then pierced the coracobrachialis. Distal to the point of entry of mcn into the coracobrachialis, a communication arose from the mcn and coursed downwards medially and ended in the mn at the mid - humeral shaft level. The communication was measured 6.8 cm in length. The main trunk of the mcn descended between the biceps brachii and brachialis, and terminated as the lateral cutaneous nerve of the forearm (Fig. 1b).

DISCUSSION

Variations in the communications of mcn and mn have been classified in many different ways. Kosugi et al. (1992) classified these variations by the number and direction of the connecting branches, whereas other authors emphasized the position of the origin of the branch and its relation to the coracobrachialis muscle (Venieratos and Anagnostopoulou, 1998). Hirasawa (1931) based his classification on the origin of the mcn from the mn or brachial plexus and the relation of the connecting branch to the coracobrachialis muscle. Buch-Hansen (1995) described four different types of mn origin in terms of the source and number of roots, and linked these patterns with the variable caliber of the connection between the mcn and mn. To compare with previous data, Choi et al. (2002) presented a unified classification, including their own results and those of others. This classification was based on the number of connecting branches or the fusion of both nerves, and stressed the significance of those communicating branches in diagnostic clinical neurophysiology.

Agarwal et al. (2011) reported a rare communicating branch which originated from the mcn, and joined the mn in the forearm after winding the persistent median artery.

In terms of the number and morphology of its heads, biceps brachii is one of the most variable muscles in humans (Rodriguez-Niedenfuhr et al., 2003). In pattern 3 by Choi et al. (2002), two connections were located at different levels between mcn and mn. The distal one passed behind a third head of the biceps brachii muscle. Sometimes a branch of the mcn ran around a supernumerary head and then fused with the present trunk. (Kosugi et al., 1992). Presence of a supernumerary head seemed to affect the course and branching of the mcn. Supernumerary heads may cause compression of neurovascular structures or confuse the doctor when a surgery is planned in that region.

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