
Unusual communication between lateral cutaneous nerve of forearm and median nerve

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ABSTRACT

Variations of the brachial plexus and its terminal branches are common. In the course of routine dissection in an adult male cadaver an anomalous communication between lateral cutaneous nerve of forearm (LCNF) and median nerve was encountered in left upper limb. Communications between lateral cutaneous nerve of forearm and median nerve may be of considerable significance to neurologists and orthopaedicians when dealing with nerve entrapment syndromes of the upper limb. Knowledge of anatomic variations of the peripheral nervous system is helpful in explaining unusual clinical signs and permits correct interpretation of clinical neurophysiology. The variation of the current study may prove interesting to anatomists and clinicians.

Keywords: unusual communication, median nerve, lateral cutaneous nerve of forearm

INTRODUCTION

Variations of the brachial plexus and its terminal branches are common. The median nerve, formed in the axilla by the union of the lateral (C5, C6, C7) root and medial root (C8, T1) derived from respective cords of the brachial plexus, enters the arm lateral to the brachial artery and to the forearm between the two heads of the pronator teres muscle¹ The median nerve does not give motor branches in the arm, but gives off vascular branches to the brachial artery and supplies articular branches to the elbow joint. The musculocutaneous nerve (C5, C6, and C7) arises from the lateral cord of the brachial plexus in the axilla and innervates muscles of anterior compartment of arm. It terminates as the lateral cutaneous nerve of the forearm which supplies the skin of the anterolateral region of forearm as far distally as the base of the thenar eminence. The musculocutaneous nerve has frequent variations associated with its connection to the median nerve; it may run behind the coracobrachialis muscle or adhere for some distance to the median nerve and pass behind

the biceps brachii muscle; some fibers of the median nerve may run in the musculocutaneous nerve; less frequently the median nerve sends a branch to the musculocutaneous nerve.^{2,3} There are reports of presence of a communicating branch arising from the musculocutaneous nerve and joining to the median nerve and communicating branch arising from the median nerve joining to the musculocutaneous nerve. The present paper deals with a rare variation of the communication of lateral cutaneous nerve of forearm and median nerves, an anastomotic branch originating from the lateral cutaneous nerve of the fore arm and joining the median nerve.

CASE REPORT

During routine dissection in an adult male cadaver an anomalous communication between lateral cutaneous nerve of forearm and median nerve was encountered in left upper limb. The communicating branch arose from the lateral cutaneous nerve of forearm just above the elbow, passing downwards and medially between radial and ulnar arteries to

join the median nerve in cubital fossa. (Fig.1)



Fig.1. Unusual communication between lateral cutaneous nerve of forearm and median nerve. MN: Median nerve; LCNF: Lateral cutaneous nerve of forearm; COM: Communicating branch; BA: Brachial artery; RA: Radial artery; UA: Ulnar artery.

DISCUSSION

Anomalies of the brachial plexus and its terminal branches are common. Communicating branches arising from the musculocutaneous (MCN) nerve and joining to the median nerve (MN) are observed frequently. Variations in the communications between median nerve and musculocutaneous nerves have been described by Le Minor⁴ into five types. In type I, there is no communication between the median nerve and musculocutaneous nerve. In type II, the fibers of medial root of median nerve pass through musculocutaneous nerve and join the median

nerve in the middle of the arm, where as in type III, the lateral root fibers of the median nerve pass along the musculocutaneous nerve and after some distance leaves it to form the lateral root of median nerve. In type IV, the musculocutaneous nerve fibers join the lateral root of the median nerve and after some distance the musculocutaneous nerve arises from median nerve and in type V, musculocutaneous nerve is absent and entire fibers of musculocutaneous nerve pass through lateral root and fibers to the muscles supplied by musculocutaneous nerve branch out directly from median nerve. Venieratos and Anagnostopoulou⁵ described communication between musculocutaneous nerve and median nerve proximal to the entrance of the musculocutaneous nerve to the coracobrachialis, Communications between the median and musculocutaneous nerves have been reported in the literature. On the contrary, anastomotic branches arising from the lateral cutaneous nerve of forearm and joining the median nerve as in this case is rare.

In a recent study by Choi et al.,⁶ such communications have been broadly classified into three types. In type I: the MCN and MN were fused; in type II: there was one connecting branch between the MCN and MN and in type III: two connecting branches were present between the MCN and MN.

VenkataRamana V et al.,⁷ have reported a loop of Lateral cutaneous nerve of forearm (LCNF) through which a perforating vein was passing and connecting the vein accompanying radial artery and median cubital vein. There are several reports on compression syndromes of LCNF. A study by Beldner et al.,⁸ in 37 cadaveric forearms showed LCNF running parallel to the

cephalic vein within the subcutaneous fat without a loop. Compression of the LCNF is an infrequently identified entrapment neuropathy. Entrapment of the LCNF most frequently occurs at the point where the nerve arises from beneath the biceps tendon and pierces the deep fascia. The LCNF may be injured during antebrachial phlebotomy which is done for both the routine venipuncture and blood donation population. A case of LCNF entrapment distal to the elbow flexion crease has also been described, but this was attributed to an anatomical variation. The possibility of entrapment of LCNF must be included in the differential diagnosis of lateral elbow pain. Patients usually present with pain around the elbow. Physical examination may demonstrate tenderness over this area, a positive Tinel's sign lateral to the biceps tendon and hypoesthesia of the anterolateral aspect of the forearm. Some patients may manifest paraesthesia along the volar aspect of the distal forearm. It is also significant to distinguish between forearm paraesthesia caused by disorders of the LCNF and the superficial radial nerve. For any cause of LCNF compression, treatment alternatives include resting and general restriction of activities, administration of non-steroidal anti-inflammatory agents, splinting, the use of ultrasound techniques, steroidal injections locally, surgical exploration and decompression.

Significant variations in nerve patterns may be the result of altered signaling between mesenchymal and neuronal growth cones or circulatory factors at the time of fusion of brachial plexus cords.^{8,9} The presence of such nerve communications are not just confined to man, studies on comparative anatomy have

reported the existence of such connections in monkeys and in some apes. Thus suggesting that communications may represent the primitive nerve supply of anterior arm muscles.¹⁰ These variations have clinical importance in post-traumatic evaluations and exploratory interventions of the arm for peripheral repair. The knowledge of the possible communications between musculocutaneous and median nerves is also important in the anterior approach for the fracture of the humerus and regional nerve blocks.

CONCLUSION

Knowledge of anatomic variations of the peripheral nervous system is helpful in explaining unusual clinical signs and permits correct interpretation of clinical neurophysiology. In diagnostic clinical neurophysiology, variations in connections between musculocutaneous nerve and median nerve may have great significance.

AUTHOR NOTE

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