

Variation of Median Nerve and Lateral Antebrachial Cutaneous Nerve: A Case Report

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Abstract

Variations of the brachial plexus regarding the composition of nerve fibres and absence or communications are common and being reported by several authors. The objective of the study was to observe and document the variation on the subject of branches of the median nerve. This report will assist clinicians and surgeons by considering anatomical variation associated with the median nerve in interpreting atypical clinical presentations. This report illustrates the two variations in details and explains the consequences they lead to. It also provides first hand anatomic data and great referential value for the future clinical work.

Keywords: Median nerve; Lateral antebrachial cutaneous nerve; Thumb-index web; Radial nerve

Introduction

Two anatomic variations are spotted during a dissection of peripheral nerves and vessels, which was conducted on an old male cadaver. The first anatomic variation is spotted at the left median nerve, where the lateral root and the medial root that form the left median nerve descend in a longer distance than usual and converge into the median nerve trunk. A communicating branch is also observed between the two roots. The second variation appears at the distribution of the lateral antebrachial cutaneous nerve, where the lateral antebrachial cutaneous nerve and the superficial branch of the radial nerve collectively dominate the area of the thumb-index web. The discovery of both variations is rare and reports on both at the same time have not been found. This report illustrates the two variations in details and explains the consequences they lead to. It also provides first hand anatomic data and great referential value for the future clinical work.

According to the first variation in this case, the two unusually long roots of the left median nerve, the lateral root and the medial root, are emitted from the fasciculus medialis plexus brachialis and the fasciculus lateralis plexus brachialis. According to the measurements during the



1) Fasciculus lateralis plexus brachialis. 2) Fasciculus medialis plexus brachialis. 3) musculocutaneous nerve. 4) Lateral root of median nerve. 5) communicating branch between Lateral and medial roots of median nerve. 6) Medial root of median nerve. 7) Ulnar nerve. 8) medial antebrachial cutaneous nerve. 9) Axillary artery. 10) Brachial artery. 11) Biceps brachii. 12) Ectopectoralis.

Figure 1: Variation of the median nerve origin.



1) Lateral antebrachial cutaneous nerve. 2) Superficial radial nerve. 3) Brachioradialis. 4) Biceps brachii. 5) Pronation teres.

Figure 2: Variation of the lateral antebrachial cutaneous nerve and the superficial branch of the radial nerve dominating thumb-index web jointly (Middle forearm).

dissection, the lengths of the two roots are 10.76 cm and 12.05 cm, with diameters 2.44 mm and 2.87 mm respectively. As a result, the two axillary arteries descend and converge into the median nerve trunk in front of the brachial artery (Figure 1). The transverse diameter of the median nerve trunk is 3.66 mm after confluence. It goes down along the medial bicipital groove with accompany of the brachial artery. In addition, a communicating branch is discovered between the lateral root and the medial root. The communicating branch starts from the medial root and terminates at a distance of 4.52 cm from the starting point of the lateral root. The length of the communicative branch is 4.28 cm, with a transverse diameter of 1.12 mm (Figure 2).

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1) Superficial radial nerve. 2) Lateral antebrachial cutaneous nerve.

Figure 3: Variation of the lateral antebrachial cutaneous nerve and the superficial branch of the radial nerve dominating thumb-index web jointly (inferolateral forearm).

There is another variation of distribution of the lateral antebrachial cutaneous nerve in this case. The left musculocutaneous nerve passes through the deep fascia from the lateral biceps tendon and transits to the lateral antebrachial cutaneous nerve. The lateral antebrachial cutaneous nerve has a diameter of 2.20 mm and is distributed under the lateral skin of the forearm. After going down 23.48 cm in distance, the end of the lateral antebrachial cutaneous nerve is divided into 4 branches from the radial side to the ulnar side, having transverse diameters of 0.97 mm, 0.51 mm, 0.75 mm and 0.52 mm respectively. It then enters the thumb-index web and distributes under the skin of the area. Meanwhile, the radial nerve emits the superficial branch at the epicondylus lateralis humeri and then turns to the opisthenarin at the distal 1/3 of the forearm. The transverse diameter of the superficial branch is 2.02 mm. At a distance of 18.31 cm from the starting point, the superficial branch is divided into 2 sub branches, with transverse diameter 1.17 mm, 1.27 mm respectively. In the end it enters the thumb-index web. The superficial branch of the radial nerve and the lateral antebrachial cutaneous nerve form a communicating branch at the

distal end of the radial styloid process (Figure 3). The communicating branch subsequently joins in the opisthenarin and is distributed under the skin of the thumb-index web.

There are two referential uses that can be extracted from these two variations. Firstly, according to the relevant information about the region of median nerve, the lateral and medial roots of median nerve are 2.77 cm and 2.83 cm long on average. Moreover, they are more merged into the median nerve at the axilla and are less located in the arm, which only accounts for $(9.7 \pm 1.6\%)$. In this case, however, the lateral and medial roots of the left median nerve descend in a longer distance and converge into the median nerve in the middle of the arm, which occurs rarely. Additionally, the communicative branch between the lateral and medial roots is also unusual. Therefore, the variation of the lateral and the medial roots of the left median nerve can be referred to in performing arm related surgery [1].

Secondly, the superficial radial nerve mainly dominates the thumb-index web. However in this case, the terminal branch of the lateral antebrachial cutaneous nerve and the superficial branch of the radial nerve conjointly form the communicative branch in the thumb-index web, which innervate the skin feeling of this region collectively [2]. Therefore, the possibility of having this variation should be taken into consideration when the patient's radial nerve injured completely, for instance humeral midshaft fractures, but sensory function in the thumb-index web remains [3]. In addition, when a patient is diagnosed with superficial radial nerve compression and the treatment effect of local block is not obvious, it might be due to the lateral antebrachial cutaneous nerve entrapment.

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