

Concurrent variations of median nerve, musculocutaneous nerve and biceps brachii muscle

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Satheesha NAYAK +
 Vijay Paul SAMUEL
 Nagabhooshana SOMAYAJI

Department of Anatomy, Melaka Manipal Medical College (Manipal Campus), Madhav Nagar, Manipal, Karnataka State—India.



+ Dr. Satheesha Nayak B,
 Associate Professor
 Department of Anatomy, Melaka Manipal Medical
 College (Manipal Campus), Madhav Nagar, Manipal
 Udipi District 576104, Karnataka—INDIA
 ☎ 91-820-292 25 19
 📠 91-820-257 18 05
 ✉ nayaksathish@yahoo.com

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ABSTRACT

Variations in the nerves and muscles of the arm are not uncommon. We saw the concurrent variations of median nerve, musculocutaneous nerve and biceps brachii muscle in the right upper limb. Biceps had an abnormal third head. The median nerve was formed below the midpoint of the arm and passed through a tunnel in the third head of the biceps along with brachial artery. The musculocutaneous nerve did not pierce coracobrachialis muscle. Median nerve and brachial artery passing through the third head of biceps may lead to neurovascular compression symptoms. *Neuroanatomy; 2006; 5: 30–32.*

Key words [median nerve] [biceps brachii] [variation] [arm] [musculocutaneous nerve]

Introduction

Biceps brachii muscle is the main muscle of the front of the arm. It has a long head which arises from the supraglenoid tubercle of scapula and a short head which arises from the tip of the coracoid process of scapula. The two heads join to form the biceps muscle. The distal end of the muscle has a strong tendon which gets inserted to the tuberosity of the radius. In addition to the tendon, the biceps is also inserted to the deep fascia of the forearm through bicipital aponeurosis. The muscle is innervated by the musculocutaneous nerve.

The median nerve is usually formed just lateral to the third part of the axillary artery by the union of its medial and lateral roots coming from medial and lateral cords of the brachial plexus respectively. It then descends down in the front of the arm and crosses the brachial artery from lateral to medial side. It enters the cubital fossa along with the brachial artery.

The musculocutaneous nerve is a branch of the lateral cord of the brachial plexus. It pierces the coracobrachialis muscle and enters the front of the arm. It supplies the biceps, brachialis and coracobrachialis muscles.

We saw concomitant variations of biceps, median nerve and musculocutaneous nerves in the right upper limb.

Case Report

During the routine dissections for medical undergraduates, three variations were found in the anterior compartment of the arm of an approximately 50 year-old male cadaver.

The variations found were unilateral. The biceps brachii had a third head (Figs. 1 and 2). This head originated from the lower part of the shaft of the humerus and the medial intermuscular septum. Its origin surrounded the median nerve and brachial artery. The third head joined with the rest of the muscle and had a common insertion with them. It was supplied by a branch of musculocutaneous nerve.

The median nerve was formed just below the midpoint of the arm (Figs. 1 and 2). The medial and lateral roots of the median nerve and the lateral cord were very long. Both medial and lateral roots of median nerve crossed the brachial artery from lateral to medial side and median nerve was formed just medial to the brachial artery (Figs. 1 and 2). The median nerve, along with brachial artery passed through a tunnel formed by the third head of the biceps (Fig. 2). Further course and distribution of the median nerve was normal.

The origin of the musculocutaneous nerve was also low (Figs. 1 and 2). The nerve did not pierce coracobrachialis. It passed between the short head and the third head of biceps. Its further course and distribution was normal. The coracobrachialis was supplied directly by a branch of the lateral cord.

Discussion

Variations in the origin of biceps brachii are common. The variations sited in the literature include bifurcate origin of the long head [1], occurrence of the third head [2–4] and occurrence of four heads [5, 6].

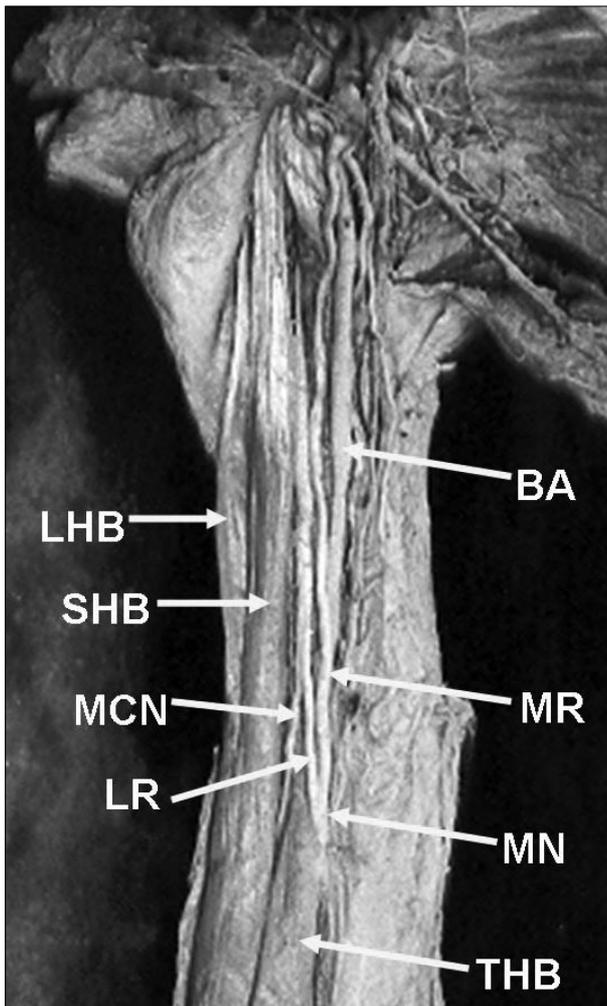


Figure 1. Dissection of the front of the arm. (*BA*: brachial artery; *MR*: medial root of median nerve; *LR*: lateral root of median nerve; *MN*: median nerve; *THB*: third head of biceps; *MCN*: musculocutaneous nerve; *LHB*: long head of biceps; *SHB*: short head of biceps)

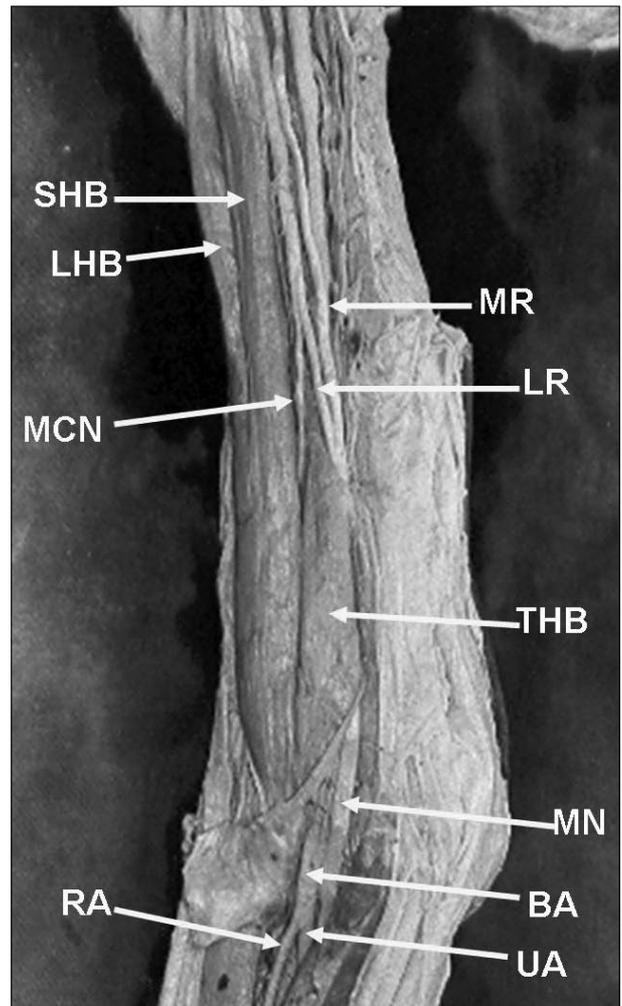


Figure 2. Dissection of the front of the arm and cubital fossa. (*BA*: brachial artery; *MR*: medial root of median nerve; *LR*: lateral root of median nerve; *MN*: median nerve; *THB*: third head of biceps; *MCN*: musculocutaneous nerve; *LHB*: long head of biceps; *SHB*: short head of biceps; *UA*: ulnar artery; *RA*: radial artery)

Variations in the formation of the median nerve have been noted. Such variations include formation of median nerve by four roots, one from medial cord and other three from the lateral cord [7]. Variations such as passing through a bony canal [8] and abnormal communications with the musculocutaneous nerve have been recorded [9, 10]. Abnormal passage and compressions in the fibromuscular canals are also known [11, 12]

The reported variations of the musculocutaneous include its total absence [13] and communications with the median nerve at various levels [9, 10]. The musculocutaneous nerve, not piercing the coracobrachialis is also known [14].

The cases of low origin of median and musculocutaneous nerves as observed here, may lead to confusions in

surgical procedures and nerve block anesthesia. The passage of median nerve and brachial artery through the third head may lead to compression of these structures, which in turn may lead to neurovascular symptoms below the level of elbow. The medial and lateral roots of median nerve crossing the brachial artery from lateral to medial side, can lead to the compression of the brachial artery. The musculocutaneous nerve also can get compressed as it passes between the short head and third head of the biceps. This compression might lead to altered sensation along the lateral border of the arm.

Anatomical variations of peripheral nerves constitute a potentially important clinical and surgical issue. Precise knowledge of variations in median and musculocutaneous nerves may prove valuable in traumatology of the arm, as well as in plastic and reconstructive repair operations.

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