

Median nerve and brachial artery entrapment in the abnormal brachialis muscle — a case report

Published online 19 May, 2008 © <http://www.neuroanatomy.org>

Bincy M. GEORGE ✦
Satheesha B. NAYAK

Melaka Manipal Medical College (Manipal Campus), International Centre for Health Sciences, Madhav Nagar, Manipal, Udipi District, Karnataka State, INDIA.



✦ Bincy M. George
Lecturer of Anatomy
Melaka Manipal Medical College (Manipal Campus)
International Centre for Health Sciences
Madhav Nagar, Manipal
Udipi District, Karnataka State, 576 104 INDIA.
☎ +91 820 2822519
✉ +91 820 2571905
✉ bincejakumary@yahoo.com

Received 30 October 2007; accepted 15 May 2008

ABSTRACT

Knowledge of variation in the pattern of muscle insertion and possible neurovascular entrapment is important for orthopedic surgeons, plastic surgeons and physiotherapists.

We found a variation in the insertion pattern of brachialis and entrapped median nerve and brachial artery due to the superficial position of the muscle, in relation to the neurovascular bundle. The brachialis was found to have an additional thick slip from the distal third of the muscle. The accessory slip partly merged with the origin of superficial flexors of the forearm and partly inserted to the medial aspect of olecranon process. The median nerve and brachial artery passed under this additional slip of brachialis.

The abnormality reported here might result in neurovascular compression symptoms in upper limb and some mechanical advantages or disadvantage in the flexion of elbow joint. © *Neuroanatomy*. 2008; 7: 41–42.

Key words [median nerve] [brachialis muscle] [brachial artery] [entrapment]

Introduction

Brachialis muscle lies beneath the biceps brachii and arises from anteromedial and anterolateral surfaces of the lower half of the shaft of humerus. A few fibers take origin from lower part of spiral groove and medial intermuscular septum also. The broad muscle covers the anterior part of elbow joint and converges to form a flat tendon which is inserted into the anterior surface of coronoid process and tuberosity of ulna. The major part is supplied by musculocutaneous nerve and the small lateral part by radial nerve. Brachialis flexes the elbow joint.

The brachial artery begins as a continuation of the axillary artery and is superficial throughout its course in the arm. When it enters the cubital fossa it lies anterior to brachialis and lateral to median nerve. At the cubital fossa it is crossed by the bicipital aponeurosis which separates the artery from the median cubital vein.

The median nerve descends along the lateral side of the third part of axillary artery and proximal part of brachial artery. At the middle of the arm opposite the insertion of coracobrachialis the nerve crosses from lateral to medial, usually in front of the artery and then accompanies along the medial side of the brachial artery. It appears in the cubital fossa beneath the bicipital aponeurosis and rests on the brachialis. The nerve leaves the cubital fossa through a gap between the superficial and deep heads of pronator teres.

We saw variation of insertion of brachialis and course of median nerve and brachial artery in the right upper limb.

Case Report

During routine dissections for medical undergraduates, a few variations were found in the anterior compartment of the arm, of an approximately 45 year old female cadaver. The variations found in the right limb and were unilateral. From the distal third of brachialis muscle a few fleshy fibers diverged and merged with superficial flexors of the forearm after an oblique course. Some of the fibers were inserted to the medial aspect of olecranon process of ulna (Figure 1).

The median nerve and brachial artery were found to be normal in the upper part of their course in the arm. In the lower one third, instead of passing superficial to brachialis, both of them passed deep to the accessory slip of brachialis (Figure 1). Rest of their course and relations were normal.

Discussion

Variations in the origin and insertion of the brachialis are rare; however, there are a lot of reports on variations of the brachial artery and the median nerve. In one of the cadaveric studies, the brachialis muscle was found to have two heads of origin. The superficial longitudinal fibers were found to insert on the ulnar tuberosity and deep oblique fibers to anterior aspect of coronoid process [1]. An anomalous muscle, without any contribution from

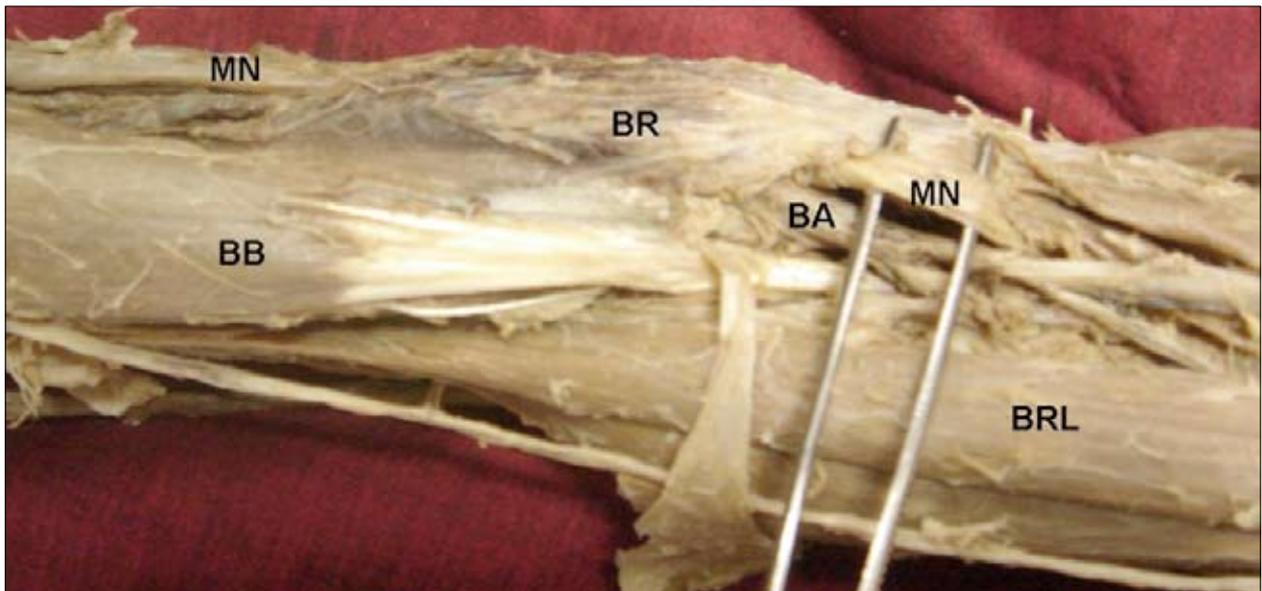


Figure 1. Dissection of the right upper limb showing abnormal course of the median nerve and brachial artery. Color version of figure is available online. (*MN*: median nerve; *BR*: brachialis fibres covering the median nerve and brachial artery; *BA*: brachial artery; *BB*: biceps brachii; *BRL*: brachioradialis)

biceps or brachialis, originated between coracobrachialis and brachialis from the humerus, has been reported previously [2]. This muscle passed obliquely across the front of the brachial artery and median nerve. The muscle also was found to blend with common origin of flexor muscles.

There are three well described entrapment syndromes involving median nerve or its branches, namely carpal tunnel syndrome, pronator teres syndrome and anterior interosseous syndrome. A few case reports were found in the literature, explaining the possible median nerve entrapment due to a third head of biceps brachii [3,4]. Even though anatomy literature hardly mentions the median nerve compression due to bicipital aponeurosis, a few

research reports say that it could be a cause of high median nerve compression, along with brachial artery [5].

Our observation of brachialis muscle variation differs from the previous reports. The additional slip that we have noted may mechanically stabilize the ulnohumeral joint, but can cause compression neuropathy of median nerve and vascular compression symptoms due to entrapment of brachial artery.

The information about accessory slip of brachialis may enhance surgical techniques of elbow. The fibers from the accessory slip might be used to reconstruct the annular ligament or the medial collateral ligament of the elbow joint.

References

- [1] Leonello DT, Galley IJ, Bain GI, Carter CD. Brachialis muscle anatomy. A study in cadavers. *J. Bone Joint Surg. Am.* 2007; 89: 1293–1297.
- [2] Dharap AS. An anomalous muscle in the distal half of the arm. *Surg. Radiol. Anat.* 1994; 16: 97–99.
- [3] Paval J. A rare case of possible median nerve entrapment. *Neuroanatomy.* 2006; 5: 35–38.
- [4] Mas N, Pelin C, Zagyapan R, Bahar H. Unusual relation of the median nerve with the accessory head of the biceps brachii muscle: an original case report. *Int. J. Morphol.* 2006; 24: 561–564.
- [5] Kumar H, Das S, Gaur S. Entrapment of the median nerve and the brachial artery by lacertus fibrosis. *Arch. Med. Sci.* 2007; 3: 284–286.