

## UNUSUAL CUBITAL FOSSA ANATOMY – CASE REPORT

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### SUMMARY

The median nerve is known to show variations in its origin, course, relations and distribution. But in almost all cases it passes through the cubital fossa. We saw a cubital fossa without a median nerve. The median nerve had a normal course in the upper part of front of the arm but in the distal third of the arm it passed in front of the medial epicondyle of humerus, surrounded by fleshy fibres of pronator teres muscle. Its course and distribution in the forearm was normal. In the same limb, the fleshy fibres of the brachialis muscle directly continued into the forearm as brachioradialis, there being no fibrous septum separating the two muscles from each other. The close relationship of the nerve to the epicondyle might make it vulnerable in the fractures of the epicondyle. The muscle fibres surrounding the nerve might pull up on the nerve and result in altered sensory-motor functions of the hand. Since the brachialis and brachioradialis are two muscles supplied by two different nerves, this continuity of the muscles might result in compression/entrapment of the radial nerve in it.

**Key words: Median nerve, cubital fossa, brachialis, brachioradialis, entrapment**

### INTRODUCTION

The median nerve is the main content of cubital fossa along with brachial artery and biceps brachii tendon. It is formed by its medial root and lateral root coming from medial and lateral cords of brachial plexus respectively (Standring, 2005). It descends along the lateral side of the third part of axillary artery and proximal part of brachial artery. At the middle part of the arm opposite the insertion of coraco-brachialis the nerve crosses from lateral to medial, usually in front of the artery and then courses along the medial side of the brachial artery (Standring, 2005). It appears in the cubital fossa beneath the bicipital aponeurosis. The nerve leaves the cubital fossa through a gap between the superficial and deep heads of pronator teres. Brachialis muscle arises from the lower half of the front of the shaft of the humerus including both the anteromedial and anterolateral surfaces of the shaft of the humerus and intermuscular septa. It is separated distally from the lateral intermuscular septum by brachioradialis and extensor carpi radialis longus muscle (Datta, 2004) It covers the anterior part of the elbow joint and its fibres converge to form a thick

and broad tendon which is inserted into the ulnar tuberosity and to a rough surface on the anterior part of the coronoid process of ulna. Brachioradialis is the most superficial muscle along the radial side of the cubital fossa. It arises from the proximal 2/3<sup>rd</sup> of the lateral supracondylar crest of humerus and from the anterior surface of the lateral intermuscular septum (Moore & Dalley, 1999). The muscle fibres end above mid forearm level in a flat tendon which inserts on the lateral side of the distal end of the radius, just proximal to the styloid process. We saw a cubital fossa without a median nerve and the fleshy fibres of the brachialis muscle directly continued into the forearm as brachioradialis muscle.

### CASE REPORT

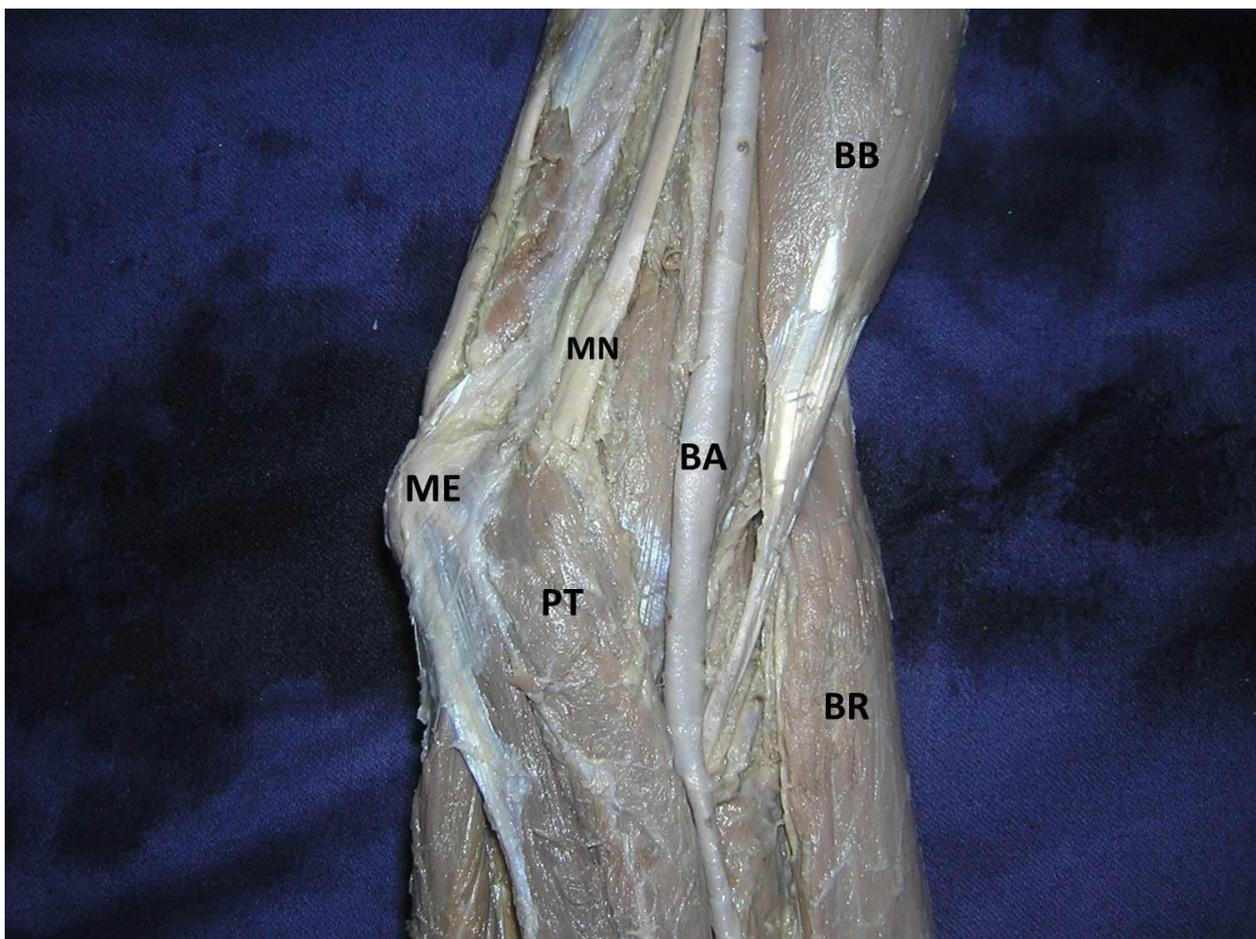
During the dissection classes for Medical students of Melaka Manipal Medical College (Manipal Campus), Manipal University, we found some rare variations in the anterior compartment of the right upper limb of an approximately 50 year old male cadaver. The median nerve had a normal

course in the arm but it did not pass through the cubital fossa. After a normal course in the proximal 2/3 of the arm, it passed in front of the medial epicondyle of humerus, surrounded by fleshy fibres of pronator teres muscle (Fig 1). Its course and distribution in the forearm was normal. The additional fleshy fibres of the pronator teres muscle arose from the medial intermuscular septum. In the same limb, the fleshy fibres of the brachialis muscle directly continued into the forearm as brachioradialis, there being no fibrous septum separating the two muscles from each other (Fig 2).

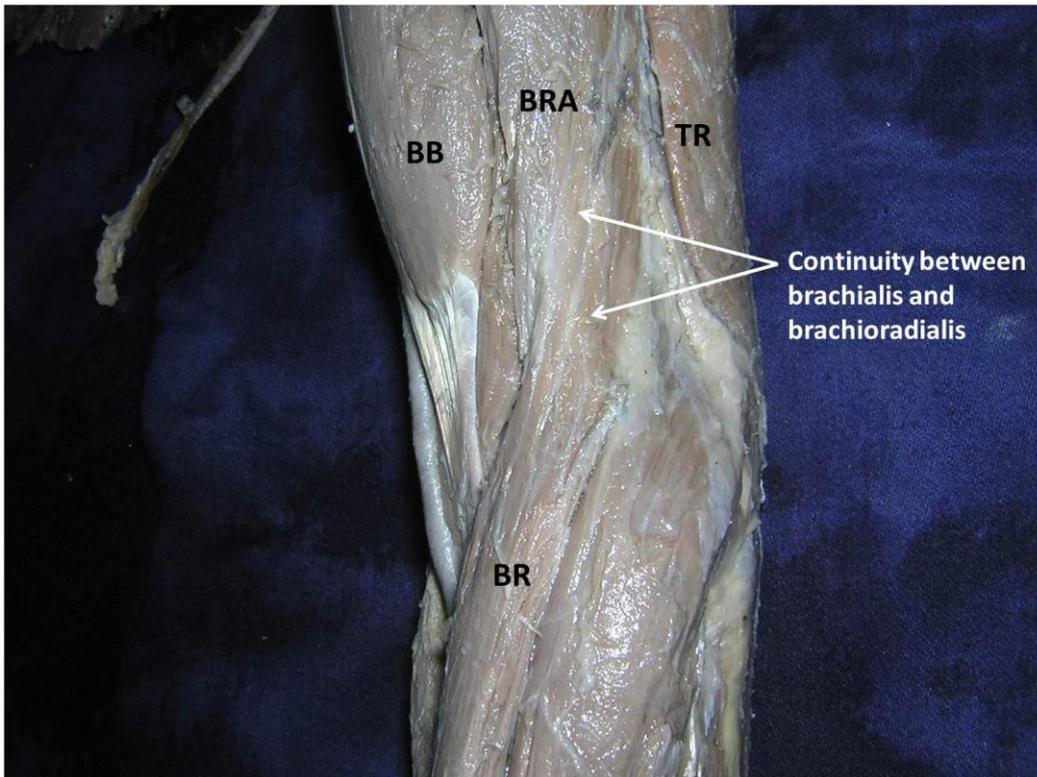
## DISCUSSION

Variations of the origin, course, relations and distribution of the median nerve are very common. Median nerve is an important

structure of the cubital fossa, in almost all cases it passes through the fossa. Absence of the nerve in the cubital fossa is an extremely rare variation. There are reports on the variations in the arrangement of the contents of the cubital fossa. Biswas et al. (2010) reported the presence of median nerve between the tendon of biceps and brachial artery in the cubital fossa. The median nerve usually leaves the cubital fossa by passing between the two heads of pronator teres muscle in more than 80% of the cases (Moore & Dalley, 1999). Pronator syndrome is due to compression of median nerve as it passes between the humeral and ulnar heads of pronator teres (Lauy & Sodutis, 1993). Other causes of entrapment of the median nerve related to the pronator teres are that it may



**Figure 1.** Dissection of the left elbow region showing the contents of the cubital fossa (MN – median nerve; BB – biceps brachii muscle; PT – Pronator teres muscle. BA – brachial artery; BR – brachioradialis muscle. ME – medial epicondyle. Note the absence of the median nerve in the cubital fossa and the fibres of the pronator teres encircling the median nerve)



**Figure 2. Dissection of the lateral aspect of the left elbow region showing the continuity of the brachialis muscle as brachioradialis muscle.** (BB – biceps brachii muscle; BRA – brachialis muscle; TR – triceps muscle; BR – brachioradialis muscle)

have a short or tendinous ulnar head, there may be a variation in the origin of the ulnar head, part of the ulnar head may arise from flexor digitorum superficialis muscle and the median nerve may also pierce the ulnar head of pronator teres (Burak et al., 2005). In the current case, the median nerve is all set for an entrapment neuropathy since it was surrounded by the fibres of pronator teres above the level of the elbow joint. Since the nerve passed anterior to the medial epicondyle, it is vulnerable in the fractures of the epicondyle.

There is scanty literature in view of its anomalous presentations. Brachialis may be divided into two or more parts or it may be fused with brachio-radialis, pronator teres or biceps. Brachioradialis muscle is often fused proximally with brachialis; its tendon may divide into two or there separately attached slips (Rajanigandha et al., 2008). In rare instance it is double or absent. Its radial attachment may be much more proximal than the base of styloid process (Williams, 1995). George and Nayak (2008) reported a case in

which few fleshy fibers of brachialis merged with brachioradialis and other superficial flexor muscles of the forearm. A case of third head of the biceps brachii and coexisting fused higher origin of brachioradialis was reported by Fating and Salve, (2011). In the present case the fleshy fibres of the brachialis muscle directly continued into the forearm as brachioradialis muscle, there being no fibrous septum separating the two muscles from each other. The fused high origin of brachioradialis may cause compression neuropathy of radial nerve.

In conclusion, this case is a unique case where median nerve can get entrapped/compressed by the surrounding fibres of pronator teres muscle. It might also get damaged in the fractures of the medial epicondyle since it was closely related to it. The continuity of the brachialis with the brachioradialis might result in entrapment of the radial nerve. The continuity of the muscles might not alter the movements of the joints of the upper limb.

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