

COMPENDIUM OF ANATOMICAL VARIANTS

Unusual Formation of the Median Nerve Associated With the Third Head of Biceps Brachii

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Unilateral variations in the formation of the median nerve, with the presence of the third head of the biceps brachii entrapping the nerve are very rare. These variations were observed on the right side, of a 30-year-old male cadaver during routine dissection at the Department of Human Anatomy, University of Nairobi. The median nerve was formed by the union of three contributions; two from the lateral cord and one from the medial cord. An additional head of the biceps brachii looped over the formed median nerve. On the left side, the median nerve was formed classically by single contributions from the medial and the lateral cords. These variations are clinically important because symptoms of high median nerve compression arising from similar formations are often confused with more common causes such as radiculopathy and carpal tunnel syndrome. *Clin. Anat.* 25:961–962, 2012. © 2012 Wiley Periodicals, Inc.

Key words: median nerve; third head biceps; variation

INTRODUCTION

Variations in the formation of the median have been reported. These include additional contributions from the middle trunk (Uzun and Bilgic, 1999). Unusual formation of the median nerve with variant contributions from the lateral cord is rare (Goyal et al., 2005). Variations in origin and insertion of the biceps brachii on the other hand include the third head of biceps which may cause median nerve entrapment (Kosugi et al., 1992; Rai et al., 2007; Kumar et al., 2008). The third head of biceps usually arises from the anterior humeral shaft at the point of deltoid insertion, and fuses with the biceps tendon (Kumar et al., 2008). Double contribution of the lateral cord to the median nerve with associated third head of biceps hitherto unreported. Often the variations in the formation of median nerve cannot be detected as they are only incidental findings during routine autopsy or cadaveric dissection; therefore this prior anatomical knowledge is important.

We undertook to look out for unusual patterns of median nerve formation of during routine dissection of the axilla and arm by first year medical students', at the department of Human Anatomy of the University of Nairobi.

RESULTS

In one case of a 30-year-old male cadaver, the median nerve on the right was formed by three contributions, an upper and lower contribution from the lateral cord and a single contribution from the medial cord. The nerve was formed anterior to the third part of the axillary artery. It received the third contribution at the mid-arm. This contribution from the lateral cord ran deep to a third head of the biceps brachii at the same level. The third head of the biceps originated from the distal end of the deltoid tuberosity and merged with the biceps tendon. The median nerve then tunneled through the brachialis muscle into the Cubital fossa (Fig. 1). There were no other noted anomalies in the cadaver.

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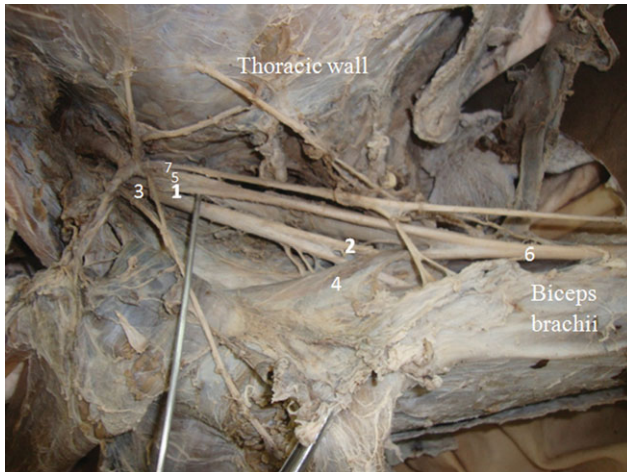


Fig. 1. Unusual formation of the median nerve (6). Note the medial contribution (5) from the medial cord (7); lateral contribution (1) from the lateral cord (3). There is an unusual third contribution (2) from the lateral cord (8). A third head of biceps brachii (4) loops over the extra contribution (2). [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

DISCUSSION

The median nerve is usually formed by two contributions; a medial one from the medial cord [cervical 8, thoracic 1] and a lateral one from the lateral cord [cervical 5–7] (Romanes, 2003). As observed in the present case, it could be formed by three contributions (Das and Paul, 2005). The third contribution usually arises from the lateral cord of the brachial plexus (Saeed and Rufai, 2003) often connecting the musculocutaneous nerve to the median nerve (Sargon et al., 1995; Prasada Rao and Chaudhary, 2000; Saeed and Rufai, 2003; Beheiry, 2004; Das and Paul, 2005; Nene et al., 2010). In other instances, the additional branch may arise from the anterior division of the middle trunk of the brachial plexus (Uzun and Bilgic, 1999). The third contribution observed in the present case may represent a large connection between the musculoskeletal and median nerve akin to those reported in literature (Badawoud, 2003). Such variations may complicate the clinical symptomatology of median nerve injury and should be kept in mind during surgery in the axilla and arm. Embryological reasons of such anomalous formation pattern may be due to the role of random factors influencing the mechanism of the development of limb muscles and peripheral nerves (Saeed and Rufai, 2003).

In the present case, third head of the biceps brachii passed over the third contribution to the median nerve. A combination of a third contribution of the median nerve with supernumerary heads of the biceps brachii is extremely rare. The presence of su-

pernumery heads of the biceps brachii occurs on its own however in 9–22% of the population (Bergman et al., 1988; Kosugi et al., 1992; Santo et al., 1998). Biceps brachii may have 3–5 heads (Bergman et al., 1988), which often occur on the right. These unusual muscles enhance elbow flexion and supination independent of the shoulder joint. Unfortunately, they are a common cause of high median nerve compression around the elbow joint (Swieter and Carmichael, 1980).

CONCLUSION

A third contribution of the median nerve may be associated with a supernumerary heads of biceps brachii, making it vulnerable to entrapment. Such entrapment may complicate symptomatology of median nerve injury. The variations in the formation of the median nerve should be born in mind during surgery in the axilla, shoulder joint, and arm.

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