

Case Study

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The Study of Anatomical Variations of Lateral Cord of Brachial Plexus - A Case Report

Mahesh Kumar* and Moh. Arshil Azeem

Department of Anatomy, SHKM GMC Nalhar, (Nuh), Haryana, India

*Corresponding author

ABSTRACT

Keywords

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Anatomical variations of brachial plexus have previously been described by various authors. But in this study more types of variations were found. The coracobrachialis muscle was innervated by nerve to coracobrachialis, a branch arising from lateral cord. The musculocutaneous nerve was not piercing the coracobrachialis. The median nerve was formed at the junction of upper one-third and lower two-third of arm by joining of lateral and medial roots from the lateral and medial cord of brachial plexus, instead in the axilla. These anatomical variations were seen on the left side of upper limb.

Introduction

Anomalies related to the formation, relations and distribution of brachial plexus cords is fairly common (Abhaya *et al.*, 2003). Lateral cord is destined to supply the flexor compartment of the upper limb and the pectoral region. It gives off lateral pectoral nerve, musculocutaneous nerve and lateral root of median nerve. Lateral pectoral nerve supplies pectoralis major. Musculocutaneous nerve supplies coracobrachialis, biceps brachii and brachialis. Finally it pierces the deep fascia at the level of elbow to continue as lateral cutaneous nerve of forearm (Ajay, 2010). Variations of brachial plexus occurs in the formation of trunks, divisions and cords; in the origin and /or combination of branches;

and in the relationship to the axillary artery and scalene muscles, however the make-up of the terminal branches (components of the nerves is unchanged (Moore and Dalley). The knowledge on variations in the course and branching of the brachial plexus assumes importance while neurotisation of brachial plexus lesions, shoulder arthroscopy through anterior gleno-humeral portal and shoulder-reconstructive surgeries are performed (Chitra, 2007; Gupta *et al.*, 2011). Normal functioning of the limbs may not be altered by these variations, but it is important to remember these variations during performance of surgical and anaesthesiological procedures (Harris and Heymann, 1904). Multiple variations in association with lateral cord piercing coracobrachialis are rare. These

variations if inappropriately compressed could lead to distal neuropathy (Suma *et al.*, 2016). Coracobrachialis is often used in the flap surgeries after mastectomy. Following mastectomy, the deformities in the infraclavicular region and the axilla are filled using the coracobrachialis flap. For obtaining the coracobrachialis flap, anatomical knowledge and its morphological variants are crucial to the surgeon. During the procedure, structures piercing coracobrachialis are prone to injury particularly if there is an unnoticed anatomical variation (Butz *et al.*, 2014)

Observations

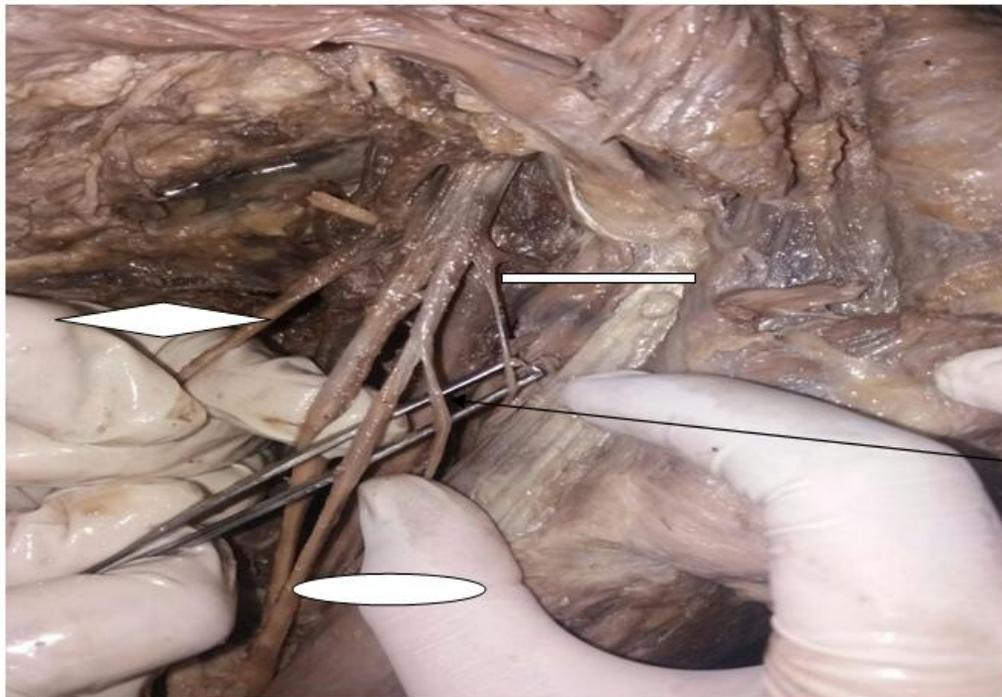
During routine dissection of about 45 year old embalmed male cadaver in Department of Anatomy, a rare unilateral variation of the lateral cord of brachial plexus was observed. In left upper limb, the axilla and arm were dissected. The cords and the branches of cords were observed. The coracobrachialis muscle

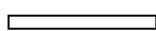
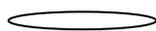
was innervated by nerve to coracobrachialis, a branch arise from lateral cord. Musculocutaneous nerve was not piercing the coracobrachialis muscle.

The median nerve was formed in the anterior and medial aspect of brachial artery by joining of lateral and medial root lower down, at the junction of the upper one-third and lower two-third of arm, instead of axilla.

Results and Discussion

Unilateral brachial plexus anomalies were demonstrated in 4 of 71 cadavers by (Sarsilmaz *et al.*, 1993). During gross anatomy dissection of 60 embalmed cadavers by Gumusalan *et al.*, the coracobrachialis muscle was found to be innervated by a nerve branch arising from the lateral root of the median nerve but not from the musculocutaneous nerve nor from the lateral cord of brachial plexus.



-  Nerve to coracobrachialis
-  Musculocutaneous nerve
-  Formation of median nerve at lower level (in the arm)
-  Ulnar Nerve

Furthermore, the musculocutaneous nerve was found not to pierce the coracobrachialis muscle and to course-downwards medial to it (Gumusalan *et al.*, 1998). In our case, in contrast, the coracobrachialis was innervated by a branch from lateral cord and musculocutaneous nerve was not found to pierce the coracobrachialis. Ilkan Tatar *et al.*, (2004) during dissection found that coracobrachialis was not innervated by musculocutaneous nerve. Instead by a branch of lateral root of median nerve but in our case, coracobrachialis is innervated by direct branch from lateral cord. Bala *et al.*, (2014) during dissection on 30 human cadavers found that median nerve was formed in anterior and medial aspect of the brachial artery by joining of lateral and medial roots from the lateral and medial cords of brachial plexus lower down, at the junction of the upper one – third and lower one-third arm instead of being in the axilla (same in our case) and similar findings were also reported earlier (Sheetal *et al.*, 2012; Charushila *et al.*, 2015; Kumar and Teja, 2016; Devi *et al.*, 2011; James *et al.*, 2014). In present study, musculocutaneous nerve was not piercing the coracobrachialis, which is similar to the findings of Kumar N, Jamuna M (n=50), Grish V Patil, Kisore CK (n=40), Shivi Goel. Though a lots of variations was seen in the branching pattern of brachial plexus in previous studies but our study showed a few additional one.

Anatomical variations reported in the present study are of great interest to neurosurgeons and researchers, while they carry out surgical procedures.

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