

Case Report

Compression of Brachial Vein between Two Lateral Roots of Median Nerve - A Case Report

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Abstract

During gross anatomy dissection, variation in the formation of median nerve of the upper limb was discovered in the right upper extremity of a 57-year-old male cadaver. Three roots contributed to the formation of median nerve instead of usual two roots i.e. two lateral roots and one medial root. After being formed the median nerve descended medial to the axillary artery. Between the two lateral roots brachial vein passed to open into the axillary vein. Anatomical variations in the formation of nerves and their unusual relationship to the surrounding structures can be the cause of nerve compression syndromes and vascular problems.

Keywords: Brachial plexus, lateral cord, median nerve, axillary artery, brachial vein

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Introduction

Variations in the arrangement and branches of brachial plexus are relatively common and are of significance to the neurologists, surgeons, anaesthetists as well as the anatomists. One of its branch, the median nerve, is usually formed by union of medial and lateral roots arising from the medial cord and lateral cord, respectively. Both the roots unite anterior or lateral to the axillary artery (1). The present study describes a case of formation of median nerve by the union of two lateral roots from the lateral cord and another root from the medial cord. Median nerve receiving two roots from the lateral cord has been reported in the past (2,3,4) but in present study in addition to the above findings, it was associated with a vascular variation.

Case Report

During dissection of axilla for undergraduates in the Department of Anatomy, Kasturba Medical College,

Mangalore, a variation in the formation of median nerve accompanied by trapping of brachial vein was discovered in the right upper extremity of a 57-year-old male cadaver. The branches of the lateral and the medial cord of brachial plexus were dissected carefully; its course was noted and photographed (Fig. 1). On the right side, we detected four branches from the lateral cord. The branches were musculocutaneous nerve (MCN), lateral pectoral nerve and the two branches which contribute in the formation of median nerve i.e., two lateral roots of median nerve. The two roots of median nerve from the lateral cord were found to be at different levels and were designated as upper lateral root (LRM1) & lower lateral root (LRM2) (Fig. 1). The LRM1 was short and thin and united with the medial root (MRM) originating from the medial cord, to form the median nerve (MN) anteromedial to the axillary artery (AA). The LRM2 was given off at about 4cm below the upper root, from the lateral cord. It was longer and thicker and joined the median nerve about 8.5cm distal to its formation. Brachial vein (*)

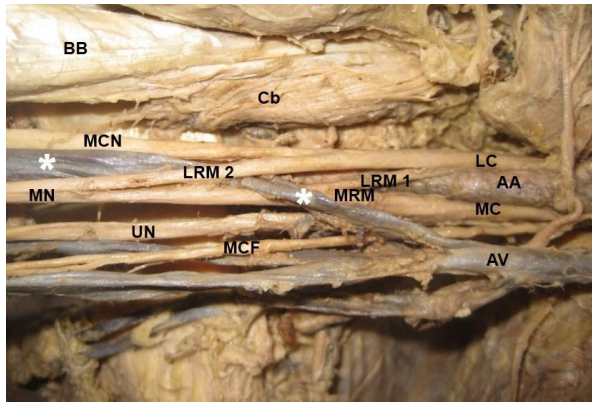


Figure 1: Dissected right axilla showing formation of median nerve by three roots and the brachial vein (*) passing between two lateral roots of the median nerve. (BB – biceps brachii; Cb – coracobrachialis; MCN – musculocutaneous nerve; LC – lateral cord; LRM1 – upper lateral root of median nerve; LRM2 – lower lateral root of median nerve; MC – medial cord; MRM – medial root of median nerve; MN – median nerve; UN – ulnar nerve; AA – axillary artery; AV – axillary vein; MCF – medial cutaneous nerve of forearm; * – brachial vein).

ascended higher up and passed in between the two lateral roots.

Discussion

Unusual relation of the brachial plexus and its branches can be credited to abnormal developmental pattern of cords and its divisions in relation to the axillary artery during embryonic life (5,6,7). Embryologically, it can be explained by understanding the role of factors influencing the mechanism of action of mesenchymal cells giving rise to limb muscles and peripheral nerves (3). Previous studies reporting additional branch from the lateral cord in the formation of median nerve, were usually associated with anomalous communication between musculocutaneous nerve and the median nerve (2,3,8,9) but in present study, no such communication was observed. Normally the medial root of the median nerve crosses the axillary artery to unite with the lateral root and the median nerve is formed anterior or lateral to the axillary artery (1) but in our study one of the lateral root i.e. upper lateral root was crossing the axillary artery anteriorly and joining the medial root to form median nerve which was formed medial to the artery. Such crossing of thick nerve root anterior to the artery may impede the blood flow in the vessel during certain movements of the shoulder joint. Additionally, an interesting finding which was observed in the present case was the trapping of brachial vein between the two lateral roots of median nerve. Such variations are likely to confuse the operating surgeons who usually operate in this region with the standard anatomical knowledge

(4).

Study on fetuses reported the variations of the brachial plexus to be more common on the right side (10). The present anomaly was also observed on the right side with the left being absolutely normal, thus conforming to the views of earlier author. Saeed & Rufai have suggested that any communication between two nerves may be due to neurobiotaxis occurring during fetal development (3). A surgeon is exposed to the topographical anatomy of the neural structures only during surgical procedures of the axilla and the shoulder; hence prior understanding of such variation may be of immense clinical help. Knowledge of such anomalies is also important during treatment of fractures. Better understanding and correct interpretation of clinical neurophysiology can only be possible with prior academic knowledge of any anatomic variations of the nerve (3).

Brachial veins are usually two venae comitantes adjoining the brachial artery in the arm which then anastomose with the basilic vein at the mid-arm level and continue as axillary vein (1). However, in the present case one of the brachial vein was unusually wider and ascended higher up and then passed between two lateral roots of median nerve to drain into the axillary vein. Brachial vein is considered for vein valve transplantation for lower extremity veins. Autogenous fistula is created between brachial artery and brachial vein (11,12) in hemodialysis. Therefore the present finding becomes significant while performing certain surgical procedures.

Conclusion

Understanding the vascular variation of a particular vein or artery is necessary prior to any surgical procedures which involve vein valve transplantations. Since, the vein is trapped between the two roots of the median nerve, venous drainage from the upper limb may be impeded leading to edema and the vein may become prone for deep vein thrombosis. Irritation of the nerve roots by the distended vein may lead to paresthesia over the area of cutaneous innervation of the median nerve.

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