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Anomalous Branching Pattern of Lateral cord of Brachial Plexus - A Case Report.

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ABSTRACT

Unilateral variation in the formation of median nerve and absence of musculocutaneous nerve was observed in the right arm of a 50 years old female cadaver. The median nerve was formed by fusion of three roots, two from lateral cord and one from medial cord of brachial plexus. The musculocutaneous nerve was absent. Two branches from the lateral cord innervated the coracobrachialis muscle. The Lateral cord further innervated the biceps brachii and brachialis muscles. The branch to brachialis gave off lateral cutaneous nerve of forearm. It is important to be aware of anatomical variations of the peripheral nervous system while planning a surgery. The origin and clinical importance of such kind of variations is discussed.

Keywords: Lateral cord, medial cord, branches.

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INTRODUCTION

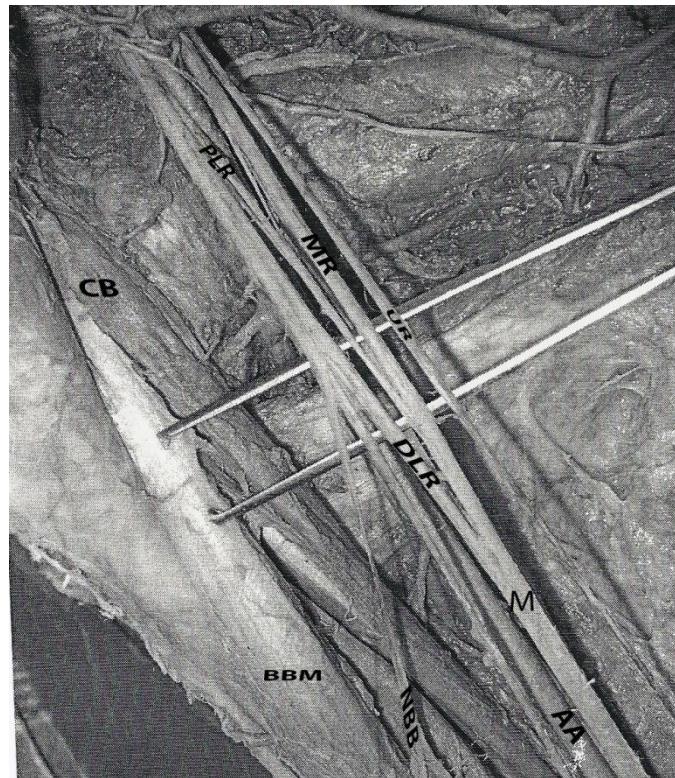
The origin and formation of the brachial plexus is described in all textbooks of anatomy (Standing) [1]. It is comprised of three cords, medial, lateral and posterior cord. Most of the variations with respect to brachial plexus are encountered in medial and lateral cord. Several investigators [2,3] reported the variations in the formation and branching pattern of the brachial plexus. Saeed et al, and Sargon et al [4,5] noticed the two roots from lateral cord contributed to the formation of median nerve. In the present study, the median nerve is formed by two roots from the lateral cord and one from the medial cord which is a rare finding.

Case Report

Unilateral variations in the branching pattern of lateral cord, medial cord and absence of the musculocutaneous nerve were observed in the right arm of a 50 years old female cadaver in the Department of Anatomy. The brachial plexus and the branches of its cords were dissected carefully. The pattern of formation of median nerve and the branches of lateral cord of brachial plexuses were noted.

There were six branches from the lateral cord. The two branches innervated the coracobrachialis, one each for biceps brachii and brachialis muscle (Fig 1). Other two branches from medial side of the lateral cord contributed to the formation of median nerve. These two branches were at different levels and were designated as proximal and distal roots of lateral cord. The proximal root was short, thin and it united with a slender branch of medial root of median nerve anterior to the axillary artery. After a short course this branch joined back the main medial root. The distal root from the lateral cord was given off 3 cm below the proximal root. The distal root was longer and thicker than the proximal. It joined with medial root of median nerve thus giving rise to the median Nerve medial to the axillary artery. We also noticed that the branch to the brachialis gave off the lateral cutaneous nerve of forearm (Fig 2).The brachial plexus of the left upper extremity was found to be normal.

Figure 1: Formation of median nerve and branches from lateral cord;

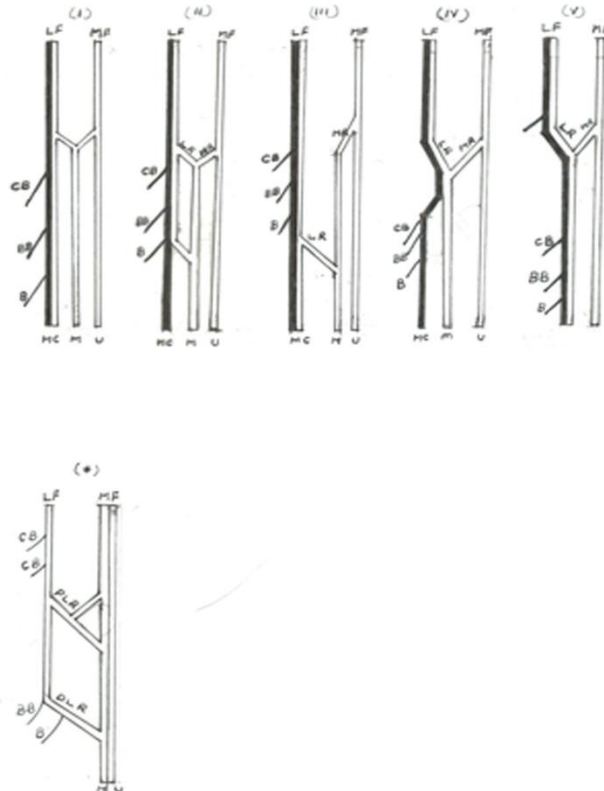


LC-lateral cord; MR-median root; M –median nerve; PLR- proximal lateral root; DLR- distal lateral root; UR-ulnar nerve; CB- coracobrachialis muscle; BBM-biceps brachii muscle; NBB- nerve to biceps brachii muscle; AA- artery.

Figure 2: M-median nerve; LCN- lateral cutaneous nerve of forearm; BRM-brachialis muscle.



Figure 3: Showing illustrations of five types of the musculocutaneous and the median nerve. (I-V) and our case (*), LF-lateral cord; MF- medial cord; MC-musculocutaneous nerve; M- median nerve; U-ulnar nerve; CB-coracobrachialis muscle; BB –biceps brachii muscle; B-brachialis muscle.



DISCUSSION

The communications between the musculocutaneous nerve and median nerve were described by many authors from nineteenth century [6-8].

Le Minor [9], described five types of communication between the musculocutaneous and median nerve (Fig.3).

- Type I: there are no connecting fibers between the musculocutaneous and median nerve as described in classical text books.
- Type II: some fibers of the medial root of the median nerve unite with the lateral root of the median nerve and form the median nerve, remaining fibers run into the musculocutaneous and after a short course it joined with the main trunk.
- Type III: the lateral root of the median nerve runs into the musculocutaneous nerve and then joined with the main trunk of median nerve.
- Type IV: The fibers of the musculocutaneous nerve unite with the lateral root of the median nerve. After a short course the musculocutaneous nerve arises from the median nerve.
- Type V: The musculocutaneous nerve is absent. The fibers of the musculocutaneous nerve run into the median nerve. Musculocutaneous nerve does not pierce the coracobrachialis.

The present variation was different from the above mentioned five types. In this the musculocutaneous nerve was absent. The front of arm muscles received innervation directly from the branches of lateral cord. The lateral cord also contributed two roots, proximal and distal to form the median nerve. Formation of the median nerve by union of two lateral roots and one medial root is reported by Sargon et al. But in the present observation a proximal root of lateral cord joined with a twig from medial cord, ran for a short distance and joined back the medial root, which again received distal root from lateral cord. Uysal et al, [10] came cross variations of the brachial plexuses in right side of the female foetuses. The present anomaly was also noted in the right side with the left being absolutely normal.

An interesting finding which was observed in the present case was the relationship between the axillary artery and median nerve. Normally the nerve will be lateral (or) anterior to the axillary artery. But in this the median nerve formation is medial to the axillary artery. Such variation in the formation of the median nerve may cause compression of the artery, leading to ischemia pain or variable arterial insufficiency during certain postural maneuvers of the shoulder joint [4]. It may also confuse the surgeon during operation. The course and branching pattern of the arteries and vein may be determined by angiographic procedure, but it is not so with respect to variations of nerve. Only at the time of surgery the variations of nerves can be noticed. Thus the knowledge of variations of nerve is of paramount importance to the surgeons.

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