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RESEARCH ARTICLE

UNUSUAL ABSENCE OF MUSCULOCUTANEOUS NERVE ALONG WITH MEDIAN NERVE FORMATION IN MID ARM

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Abstract

The lateral root of the brachial plexus issues three branches namely musculocutaneous nerve, lateral root and lateral pectoral nerve. The musculocutaneous nerve innervates all the muscles of anterior compartment of the arm. The median nerve is formed by union of lateral root of lateral cord and medial root of medial cord in axilla. But we found in one male cadaver, the absence of musculocutaneous nerve. The median nerve was formed by lateral root of lateral cord and medial root of medial cord as usual but in mid arm. In this case, the coracobrachialis is supplied by branch from lateral cord and biceps brachii and brachialis muscles were innervated by median nerve.The comprehension of these variations of musculocutaneous and median nerves are essential for clinicians for detecting weakness or paralysis of flexor muscles of arm due to injury to median nerve along with loss of flexion and supination of forearm, loss of sensation in the skin of lateral portion of the forearm and motor loss along the median nerve distribution

Introduction:-

Brachial plexus is a complex network of nerves formed from anterior primary rami of spinal nerves C5-T1. The spinal nerves C5 and C6 join to form superior trunk, C7 continues as middle trunk and inferior trunk is formed by union of spinal nerves C8-T1. Each of the above mentioned trunks bifurcate into and anterior and posterior divisions. Divisions join to form cords. Three cords namely lateral, medial and posterior cord are formed by union of divisions (Dutta, 2017). The lateral cord gives of three branches: lateral pectoral nerve, musculocutaneous nerve and lateral root of median nerve. The musculocutaneous nerve enters the arm by piercing the coracobrachialis muscle after which it courses between the biceps brachii and brachialis brachii muscles supplying the muscles of anterior compartment of arm. At the elbow, it continues as the lateral cutaneous nerve of forearm (Standring, 2005).The median nerve is formed by union of lateral root from the lateral cord and medial root from the medial cord. These two roots join together anterior to third part of axillary artery in axilla. The lateral root contains C8 and T1 fibers while medial root is comprised of C5, C6, and C7 fibers (Dutta, 2017). The median nerve continues in the forearm anterior to the brachial artery and in the upper arm, it crosses the brachial artery and comes to lie medial to brachial artery. The median nerve does not give any branch in the arm (Standring, 2005). The anatomical variations of brachial plexus and its branches are well documented. However, the musculocutaneous nerve may pass deep to

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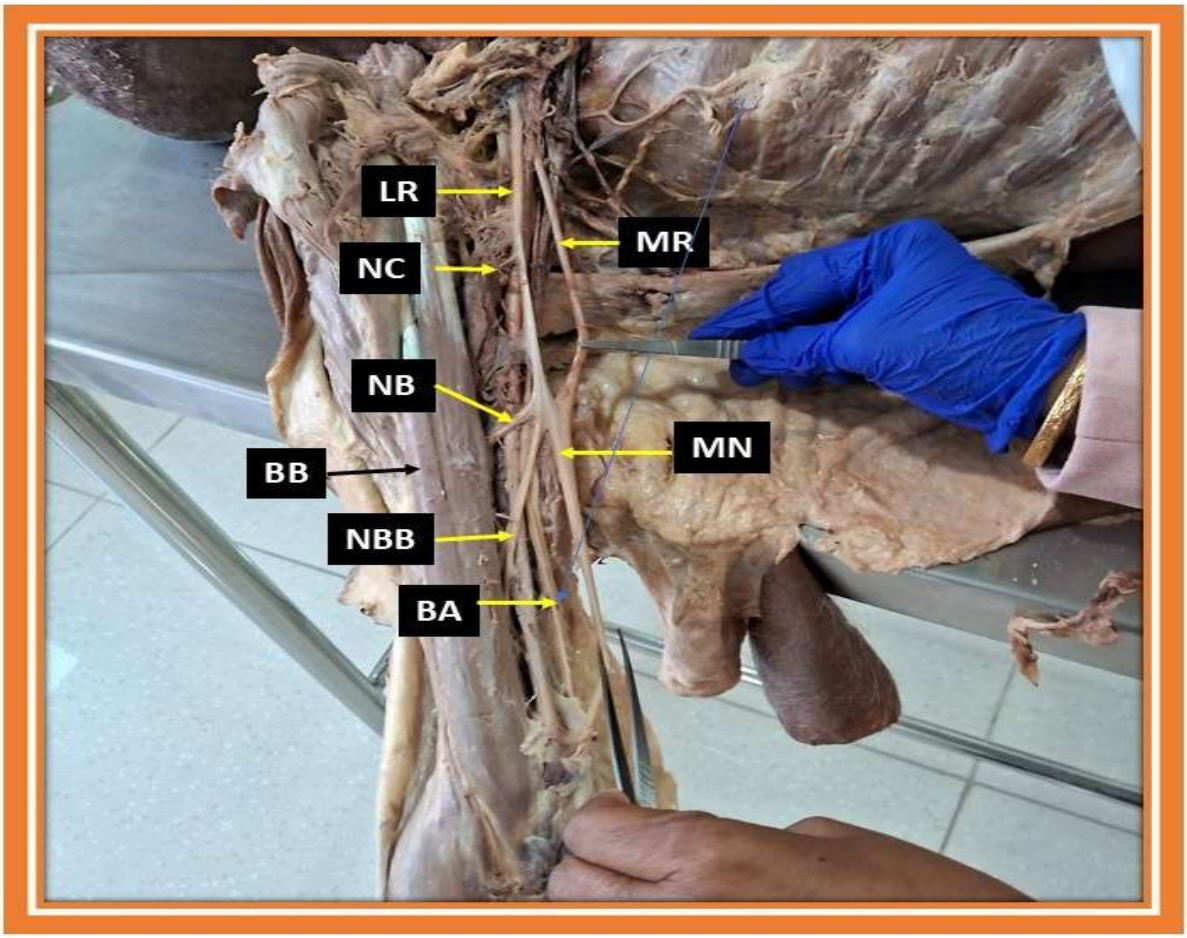
coracobrachialis or cling to the median nerve then course deep to biceps or a branch to musculocutaneous nerve arises from the median nerve (Standring, 2005). The musculocutaneous nerve may occur in a pair or may be absent.But, incidence of absence of musculocutaneous nerve is not exactly known. The musculocutaneous nerve is observed to arise from the lateral cord in 90.5%, from posterior cord and medial cord in 4% and 2% of population respectively and separately but simultaneously frommedial and lateral cords in 1.4% of individuals (Arora and Dhingra), 2005. Here we describe a case of absence of musculocutaneous nerve along with variant formation of median nerve in the middle of arm in place of axilla.

Case presentation:

The axilla and anterior compartment of arm of right side of formalin fixed male cadaver of 60-year-old was dissected using standard dissection technique described in Cunningham's manual for teaching to first year MBBS student of 2025-2026 batch. The musculocutaneous nerve was found to be absent and median nerve was observed to be formed by union of lateral root of lateral cord and median root of medial cord in the middle of arm anterior to brachial artery (Figure 1). It was also found that the median nerve crossed the brachial artery from anterior to medial side of brachial artery. The median nerve issued separate muscular branches to biceps brachii and brachialis muscles of the anterior compartment of the armbut nerve to coracobrachialis arose from lateral root (Figure 1). Rest of the course of median was normal as described in standard text books of Anatomy. On contralateral limb, the configuration of musculocutaneous and median nerve was normal.

Figure legend:

Figure 1: displaying absence of musculocutaneous nerve with formation median nerve in midarm LR: lateral root, MR: medial root, NC: nerve to coracobrachialis muscle, NB: nerve to brachialis muscle, BB: biceps brachii muscle, NBB: nerve to biceps brachii muscle, MN: median nerve, BA: brachial artery



Discussion:-

The variation of brachial plexus formation along with its branches are well cited in literature. We observed absence of musculocutaneous nerve along with formation of median nerve by lateral root of lateral cord and medial root of medial cord anterior to brachial artery. But the formation of median nerve was in the middle of arm. The combination of aforementioned anomalies is rare. variable course of the musculocutaneous and median nerve is described by various authors (Le Minor, 1992; Fregnani et al., 2008; Pacholczak et al, 2011; Parchand and Patil, 2013).Some authors classified the course of musculocutaneous nerve and median nerve into five types (Le Minor, 1992). The type five of this classification coincided with our case report but with difference that median nerve was formed in mid arm in our case. In addition, the absence of musculocutaneous nerve is also reported by various authors (Fregnani et al., 2008; Pacholczak et al, 2011; Parchand and Patil, 2013; Malukar O, Rathva), 2011; Rao and Chaudhary, 2001; Nasr, 2012). In all aforementioned cases, the place of musculocutaneous was taken by the median nerve and the median nerve supplied all muscles of arm normally innervated by musculocutaneous nerve. Prasad Rao and Chaudhary found the absence of musculocutaneous nerve in 8% of upper limb dissected. In our case also, the musculocutaneous nerve was absent and biceps brachii and brachialis muscles were supplied by by median nerve. But, inaddition to above observations, in our case the median nerve was formed in the mid arm which normally is observed to form in axilla.

Conclusion:-

Variations of musculocutaneous and median nerve are of utmost use for surgeons and clinicians during shoulder and upper arm reconstruction as these nerves are likely to be injured during these procedures. Moreover, detailed information of these variations are important to understand weakness or paralysis of flexor muscles of arm due to injury to median nerve. When place of musculocutaneous nerve is taken by median nerve, injury to median nerve may cause loss of flexion and adduction of arm, flexion and supination of forearm, loss of sensation in the skin of lateral portion of the forearm and motor loss along the median nerve distribution.

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