

Case Report

BILATERAL COMMUNICATING BRANCH BETWEEN MUSCULOCUTANEOUS AND MEDIAN NERVE

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ABSTRACT

Connections between the musculocutaneous and median nerve are not uncommon. But knowledge of such variations is important for surgeons to perform surgical procedures. Here a female cadaver of 34 years age was found during dissection classes of undergraduate MBBS students, with communicating branch connecting musculocutaneous nerve with median nerve bilaterally.

KEY WORDS: Communicating branch, Musculocutaneous nerve, Median nerve.

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INTRODUCTION

The brachial plexus is of great practical importance to the surgeon [1]. Variations of the brachial plexus and its terminal branches are not uncommon [2]. Also, Variations in connections between the musculocutaneous and median nerves in the arm are not as uncommon as was once thought [3].

Musculocutaneous nerve, a branch of the lateral cord of brachial plexus, after its formation supplies the coracobrachialis and then pierces it. The nerve then supplies the remaining flexor muscles of the arm namely brachialis and biceps brachii to continue as the lateral cutaneous

nerve of the forearm. The median nerve is formed by contributions from both the lateral and medial cord. It usually does not supply the muscles of the arm, though however it gives vascular branches to the brachial artery and articular branches to the elbow joint [4]. Before leaving the axilla some fibres from C7 conveyed by the median nerve are handed over to the ulnar nerve [5].

The appearance frequency of this variable connection between median and musculocutaneous nerve was reported to be in the range between 10 and 53.6 % of cases [6,7,8].

Any anomalous pattern of the musculocutaneous nerve and the median nerve is related to embryological development. Knowledge of such variations is important for surgeons to perform surgical procedures in the axillary region and in the upper arm [9].

CASE REPORT

During routine dissection classes of undergraduate MBBS students, a female cadaver of 34 years age was found with communicating branch connecting musculocutaneous nerve with median nerve bilaterally. On the right side, the communicating branch originated from the musculocutaneous nerve and join with median nerve in the upper one third of right arm (figure 1). On the left side, the communicating branch after originating from musculocutaneous nerve joined with median nerve in the middle one third of left arm (figure 2).

Fig. 1: upper third of right arm with axilla showing communicating branch (CB), originated from musculocutaneous nerve (MCN), joining with the median nerve (MN).



Fig. 2: middle third of left arm with axilla showing communicating branch (CB) originated from musculocutaneous nerve (MCN) joining with median nerve (MN).



DISCUSSION

Various classifications of communication between median and musculocutaneous nerve were proposed by many authors. Loukas M et al. [10] classified the communication patterns as Types I, II, III and IV, after dissecting 129 formalin fixed cadavers.

Type I: the communications were proximal to the point of entry of the musculocutaneous nerve into the coracobrachialis,

Type II: the communications were distal to the point of entry of the musculocutaneous nerve into the coracobrachialis,

Type III: the musculocutaneous nerve did not pierce the coracobrachialis.

Type IV: the communications were proximal to the point of entry of the musculocutaneous nerve into the coracobrachialis and additional communication took place distally.

Choi D et al. classified the variations in three main patterns. Pattern 1: fusion of both nerves. Pattern 2: presence of one supplementary branch between both nerves and Pattern 3: two branches. Pattern 2 was further subdivided into a sub-group 2a when a single root from the musculocutaneous nerve contributed to the connection and 2b when there were two roots from the musculocutaneous nerve [3]. According to this classification, both right and left side were pattern 2a type of variations in the present case.

Guerri-Guttenberg and Ingolotti (2009) [11] proposed a classification based on four steps to identify the variation of the musculocutaneous nerve. First step is determining the presence or absence of the nerve. When the

nerve is present, the second step determines if the nerve pierces the coracobrachialis muscle. The third step is concentrating on the presence of communication between the median and musculocutaneous nerve. Level of this communication and its relation to the piercing point on the coracobrachialis muscle are solved in the fourth step.

In Choi D et al. study of 138 cadavers, communicating branch between musculo-cutaneous and median nerve was bilateral in 14.06% and unilateral in 85.94% of cadavers. The study also concluded that there were no statistically significant differences by gender and side in communicating branch [3]. In the present case, there was bilateral communicating branch between musculocutaneous and median nerve.

The embryological development and the factors affecting its progress are the base for interpretation of the anatomical anomalies origin [7,12]. The main branches of the plexus are visible by 38–40 days of embryological life. The brachial plexus is divided into ventral and dorsal segments. The roots of median and ulnar nerves are arising from the ventral root. The musculocutaneous nerve originates from the median nerve. The common origin of these two nerves could be the explanation of their various anatomical anomalies [13].

The communication between the musculocutaneous and median nerves can be regarded as remnant of the phylogenetic development. Comparative anatomical studies reported observation of similar interconnecting branches in monkeys and apes. The lower vertebrates possess only one nerve trunk in their thoracic limb, which is considered as equivalent to the median nerve [11].

Knowledge of the existence of musculocutaneous and median nerve communication in the arm is clinically important; it allows an adequate evaluation and management of upper limb motor disorders caused by peripheral nerve injuries as well as a correct surgical planning and approaches of axilla and arm [14,15].

CONCLUSION

Though the connections between musculocutaneous and median nerve are not uncommon but their existence is clinically very important.

Conflicts of Interests: None

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