

*Case Report***A Single Common Cord in the Infraclavicular Part of the Brachial Plexus**

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Coimbatore, India\*Correspondence Email: [drjamunam@gmail.com](mailto:drjamunam@gmail.com)*Received: 6/01/2012**Revised: 17/03/2012**Accepted: 17/05/2012***ABSTRACT**

**BACKGROUND AND OBJECTIVES:** In the infraclavicular part, the brachial plexus presents as lateral cord lateral to the axillary artery, medial cord medial to the axillary artery and the posterior cord posterior to the axillary artery. The Musculocutaneous nerve arises from the lateral cord of brachial plexus. It pierces and supplies Coracobrachialis, biceps brachii and brachialis and continues as the lateral cutaneous nerve of forearm. Awareness of the anomalies of the formation of Brachial plexus and its terminal branches are valuable in traumatology of the arm.

**METHODS:** The infraclavicular part of the brachial plexus was dissected during the regular dissection of cadavers for undergraduate students. The number of cords and the branches of the cords and their relation with axillary artery were noted.

**RESULTS:** A single common cord with absence of musculocutaneous nerve on the left side of a cadaver was observed. The median nerve took over the innervations which are supposed to be supplied by the Musculocutaneous nerve. The clinical implications of these findings are discussed.

**INTERPRETATION AND CONCLUSION:** This observation shows that variations in the cord stage are very rare and awareness of this is very useful in traumatology of the arm and in plastic and reconstructive repair surgery.

**KEY WORDS:** Brachial plexus, common cord, Musculocutaneous nerve, median nerve, absence.

**INTRODUCTION**

Anatomical variations of the infraclavicular part of the Brachial plexus acquire importance during surgical procedures like reduction of fractures and

dislocations, suturing of tendons and muscles, repair of wounds in the upper limb and also in Brachial plexus block.

The presence of a single common cord in the infraclavicular part of the

Brachial plexus is very rare. It was first reported by Walsh <sup>[1]</sup> as an abnormal common trunk produced by the connective tissue wrapping of the medial and posterior cords. According to Singer <sup>[2]</sup> the single common cord was formed by union of all the roots of the brachial plexus and he explained this to be due to the abnormal formation of axillary artery.

## MATERIALS AND METHODS

During the routine dissection of cadavers for undergraduate medical students this variation was observed. Dissection of the Brachial plexus was conducted on the right and left sides of the cadavers. The pectoral region, the axilla and the arm were dissected. The anatomical elements like cords and branches of the Brachial plexus, axillary artery and axillary vein were identified. The relations of the cords and

branches of the Brachial plexus to the axillary artery were noted.

## RESULTS

A single common cord was found in one left upper limb of a cadaver during the routine dissection for undergraduate medical students. The single common cord was identified below the clavicle and it was formed by the union of all the divisions of the trunks of the Brachial plexus. The common cord was running posterolaterally to the first and second parts of the Axillary artery. The branches of the Brachial plexus were originating from the common cord and the Musculocutaneous nerve was found to be absent and the median nerve was found to be furnishing branches to the structures which were supposed to be supplied by the musculocutaneous nerve (Figure 1).

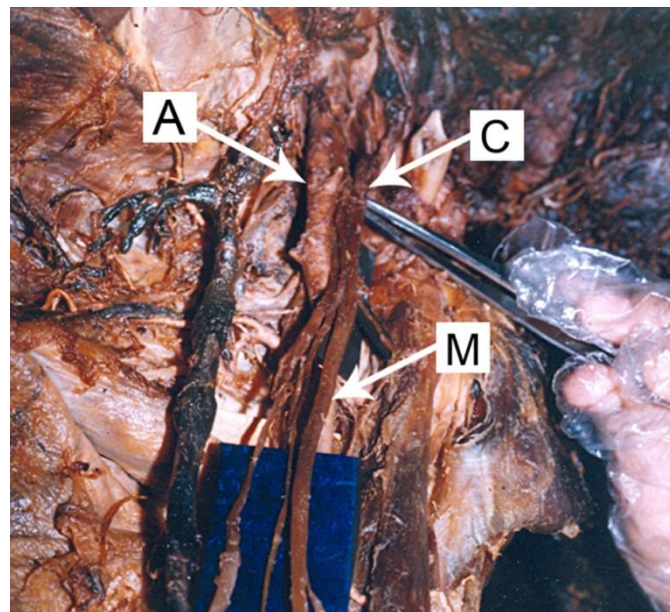


Figure 1: Single Common Cord. Absence of Musculocutaneous nerve. C - Common cord; A - Axillary Artery; M - Median nerve

## DISCUSSION AND CONCLUSION

A rare variation of the cords of the Brachial plexus was reported by Singer <sup>[2]</sup> in a case in which all the roots of the plexus

united to form a single cord. He explained this to be due to the abnormal formation of Axillary artery. The single common cord resulted from the connective tissue wrapping

of the cords. Proper dissection of the connective tissue without interrupting nerve fibres resolved the plexus into a normal one.<sup>1</sup> In the present study, a single common cord was found in one left upper limb. Another variation in the formation of the cords is that the upper and middle trunks failed to divide as usual but united to form a lateral cord and then divided into lateral cord proper and the major contribution to posterior cord.<sup>[3]</sup> It was also reported in three Brachial plexus the medial and lateral cords united to form a single cord anterior to the Axillary artery so that only anterior and posterior cords were present; the anterior gave off the branches to both the medial and lateral cords.<sup>[3]</sup> In the present study, these variations were not observed. In one Brachial plexus, instead of the usual three cords, only two cords, a smaller and larger may be present and it was found that the larger cord will replace either the medial and lateral or the medial and posterior cords.<sup>[4]</sup> These variations were not observed in the present study.

Oluyemi et al.<sup>[5]</sup> encountered a Brachial plexus with two cords medial and lateral and three abnormal communications. Pandey & Shukla<sup>[6]</sup> also had reported absence of the posterior cord in 3.5% of cadavers. In the present study these variations were not observed. Connective tissue that defines the usual anatomical subdivisions of the plexus may not separate them according to the normal plan; the normal subdivisions are usually demonstrable by splitting connective tissue planes in the plexus.<sup>[7]</sup> Hollinshead<sup>[7]</sup> also described sometimes a true anterior cord occurs, without the usual splitting into lateral and medial cords. These variations were not observed in the present study.

The Musculocutaneous nerve usually arises as a single nerve from the lateral cord.<sup>[8]</sup> The Musculocutaneous nerve failed to separate from the median nerve and the

median nerve gave off the branches which would have been given off from the musculocutaneous nerve.<sup>[9]</sup> The musculocutaneous nerve was found to be absent in 2 cases and it was replaced by branches from the median nerve.<sup>[10]</sup> In one cadaver there was absence of musculocutaneous nerve and the various muscles which were normally supplied by the musculocutaneous nerve were instead supplied by the median nerve from its lateral aspect.<sup>[11]</sup> In the present case coinciding with the above reports the Musculocutaneous nerve was found to be absent but in discrepancy with the above reports the nerve was found to be absent from the common cord instead of lateral cord. Leminor<sup>[12]</sup> had described in Type V of his classification of communications between median nerve and musculocutaneous nerve as the musculocutaneous nerve to be absent and the entire fibres of the musculocutaneous nerve passed through the lateral root and fibres to the muscles supplied by musculocutaneous nerve branched out directly from the median nerve. Absence of the musculocutaneous nerve and the innervation of the coraco brachialis, biceps brachii and brachialis by the median nerve is an unusual variation in the Infraclavicular part of the brachial plexus.<sup>[13,14]</sup> The constituent fibres of the musculocutaneous nerve remained adherent to the outer head and trunk of the median nerve for a variable distance in the upper part of the arm in 8% of cases and the median nerve furnished the muscular branches.<sup>[9]</sup>

Coinciding with the above reports the musculocutaneous nerve was found to be absent from the common cord and the branches to the coraco brachialis, biceps brachii and brachialis were originating from the median nerve.

Knowledge of such anatomical variations in the nerves of the arm is

important in anterior surgical approaches to the shoulder. It is essential in light of frequency with which surgery is performed in axilla and also in open reduction and fixation in fracture surgical neck of humerus. It is also important to be aware of these variations during infraclavicular brachial plexus block. Knowledge of these variations is important in nerve entrapment syndromes involving different branches of brachial plexus. [5]

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