

Case Report

A rare case of variation of the cords of brachial plexus

Sweekritha, Qudusia Sultana, Vidya Pillai, Chitra P. Rao

Department of Anatomy, A.J. Institute of Medical Sciences, Mangalore, India

Abstract

Variations of the brachial plexus and communication between its branches are commonly reported in literature. The present case report describes a rare unilateral variation of the trunks forming two cords of the brachial plexus, which was observed during routine dissection of a male cadaver in the Department of Anatomy, A.J. Institute of Medical Sciences, Mangalore, India. These variations are of clinical significance to surgeons and anaesthetists as they are prone to injury during surgical and anaesthetic approaches in the region of the axilla and arm.

© 2012 International Journal of A J Institute of Medical Sciences. All rights reserved.

Keywords : Brachial plexus; Cords; Trunks; Anatomic variation

Article received 25th March, 2012; Accepted 12th April, 2012.

1. Introduction

Variations of the brachial plexus have been reported previously by many authors most involving the origin or communication between the branches.¹ Brachial plexus with only two trunks forming two cords is a rare variation. Understanding of these variations is necessary for surgeons, radiologists and anatomists as these may be vulnerable to damage in radical neck dissections, surgical operations of the axilla, axillary lymph node dissection for breast malignancies, shoulder arthroscopy and shoulder reconstructive surgeries. They also have clinical implication in diagnosis and interpretation of nerve injuries of the upper limb and infraclavicular anaesthetic nerve blocks for surgeries of the upper limb.^{2,3}

2. Case report

During routine dissection of a male cadaver in the Department of Anatomy, A J Institute of Medical Sciences, Mangalore, India a variation of the trunks and cords of the brachial plexus was observed in the left upper limb. The cords and their branches were dissected and their relations noted.

On the left side two trunks were found in the lower part of the neck. Each trunk divided into anterior and posterior divisions behind the clavicle. Anterior division of both the trunks joined to form the anterior cord. Similarly both the posterior divisions joined to form the posterior cord. Instead of three cords only two cords were present which were lateral to the axillary artery (Fig. 1). Anterior cord representing the fusion of medial and lateral

cords gave rise to the branches-lateral and medial pectoral, musculocutaneous, median, ulnar and medial cutaneous nerves of the arm and forearm (Fig. 2). The posterior cord gave rise the branches- upper and lower subscapular, thoracodorsal, radial and axillary nerves (Fig. 3).

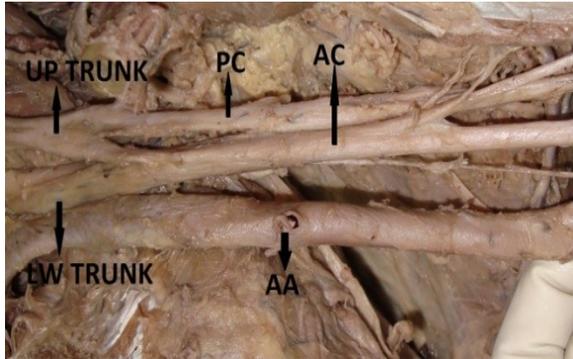


Fig. 1: Two trunks and two cords in relation to the axillary artery (UP TRUNK-upper trunk, LW TRUNK- lower trunk, PC-posterior cord, AC- anterior cord, AA- axillary artery).

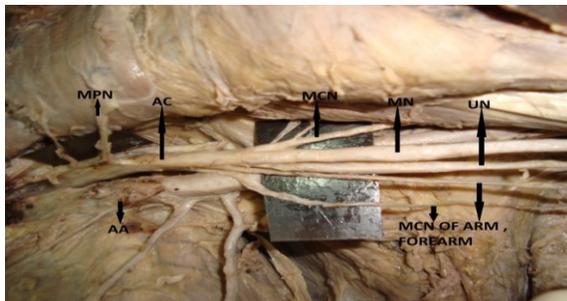


Fig. 2: Branches from the anterior cord. (MPN- medial pectoral nerve, MCN- musculocutaneous nerve, MN- median nerve, UN- ulnar nerve, MCN OF ARM, FOREARM- medial cutaneous nerve of arm and forearm, AA- axillary artery, AC- anterior cord.)

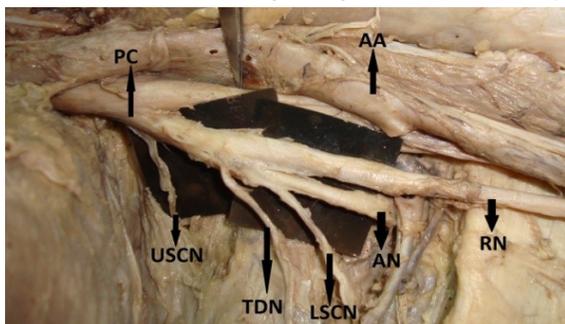


Fig 3: Branches from the posterior cord (USCN- upper subscapular nerve, LSCN- lower subscapular nerve, TDN- thoracodorsal nerve, AN- axillary nerve, RN- radial nerve, AA- axillary artery, PC- posterior cord).

3. Discussion

Brachial plexus in the form of three trunks, three cords and their branches supply the entire upper limb. Pandey and Shukla studied axilla of 172 cadavers and found absence of posterior cord in 6 cadavers. The fibres of posterior cord merged with lateral and medial cords which were joined by communicating branches.³ In our case medial and lateral cords fused to form a single cord and no communicating branches were seen. Jamuna and Amudha reported a case of only two cords, both lateral to axillary artery. Anterior cord represented the fusion of medial and lateral cords.⁴ This case was similar to our case in terms of branching and location of the cords but in our case only two trunks were found. Aggarwal et al. found four cases of fused single cord out of 90 cases. The location of these was lateral to axillary artery instead of the normal perivascular pattern.⁵ Oluyemi et al. reported a case of two cords lying medial and lateral to the axillary artery with three communications. The branches of posterior cord were given by medial cord.⁶ This was different from the present case where the two cords were anterior and posterior without any communications. Shanker and Veeramani described a similar case where anterior divisions from the three trunks fused to form a common cord. This trifurcated forming musculocutaneous, median and ulnar nerves.⁷ Satyanarayana et al. reported a case where all the three cords were lateral to the axillary artery. He described it on embryological basis stating that early contact between nerves and muscle cells is required for complete differentiation. Several signalling and transcription factors play an important role and any misexpression causes abnormalities in nerve plexus formation.⁸

4. Conclusion

Knowledge of variations of the brachial plexus and their relations to the blood vessels is important because of the frequencies with which surgeries are done in the axilla and arm. The

present case report throws light on the two trunks and two cord stages of the brachial plexus and their variant course in relation to the axillary artery. Awareness of such variations may be of help to the clinicians and surgeons.

References

1. Moore KL, Dalley AF. Clinically oriented Anatomy. 4th Ed. Philadelphia: Lippincott, Williams and Wilkins, 1999.
2. Abhaya A, Khanna J, Prakash R. Variation of the lateral cord of brachial plexus piercing coracobrachialis muscle. *J Anat Soc India* 2003; 52:168-170.
3. Pandey S K, Shukla V K. Anatomical variations of the cords of brachial plexus and the median nerve. *Clin Anat* 2007;20:150-156.
4. Jamuna M, Amudha G. Two cord stage in the infraclavicular part of brachial plexus. *Int J Anat Var* 2010;3:128-129.
5. Aggarwal A, Sahni D, Kaur H, Batra YK, Sondekoppam RV. A rare anatomical variation of the brachial plexus: single cord anomaly. *Anesth Analg* 2012;114:466-70.
6. Oluyemi KA, Adesanya OA, Ofusori DA, Okwuonu CU, Ukwenya VO, Om'iniabohs FA, et al. Abnormal pattern of brachial plexus formation: an original case report. *Internet J Neurosurg* 2007;4.
7. Shanker N, Veeramani R. Replacement of medial and lateral cords of the brachial plexus by a common cord and its trifurcation into major branches. *Int J Anat Var* 2010;3:205-7.
8. Satyanarayana N, Vishwakarma N, Kumar GP, Guha R, Datta AK, Sunitha P. Variation in relation of cords of brachial plexus and their branches with axillary and brachial arteries--a case report. *Nepal Med Coll J* 2009;11:69-72.

Corresponding author

Dr. Sweekritha
 Postgraduate
 Department of Anatomy
 A J Institute of Medical Sciences
 Mangalore 575004, INDIA.
 E mail-dr.sshetty@yahoo.com