

Case Report

A rare variation in the formation of the lateral cord and median nerve of brachial plexus – A case report

Virendra Budhiraja, Rakhi Rastogi, Satyam Khare, Shilpi Jain

Subharti Institute of Medical Sciences, Delhi-Haridwar by Pass Road, Meerut-250002 (U.P.)

Abstract:

Brachial plexus is the plexus of nerves that supplies the upper limb. The Anatomical variations of the brachial plexus in humans have clinical significance to surgeons, radiologists and anatomists. Variation in the origin and distribution of branches of brachial plexus are common but variation in the roots, trunks and cords are very rare. Here we report a rare variation in the formation of lateral cord and variation in origin of median nerve. Lateral cord was formed by anterior division of upper trunk alone (C_5, C_6), but an additional intermediate cord between medial & lateral cord was found which was a continuation of anterior division of middle trunk (C_7). Median nerve was formed by: A lateral root carrying C_5 and C_6 fibers arising from lateral cord, intermediate cord carrying C_7 fibers and medial root of medial cord carrying C_8 and T_1 fibers.

Key Words: Brachial plexus, lateral cord, Median Nerve, variations.

Introduction:

The brachial plexus is a complex of nerves originating in the neck and axilla. It is formed by the union of the ventral rami of the fifth, sixth, seventh and eighth cervical and the first thoracic spinal nerves. This nerve plexus can receive small contributing branches from the ventral primary ramus of the fourth cervical (C_4) or the second thoracic (T_2) spinal nerves (Harris, 1903). The human brachial plexus has three trunks (upper, middle and lower) and three cords (medial, lateral and posterior), which divide into nerves of the upper extremity (Brash, 1953; Groot & Chusid, 1985).. Variations are common in branches of brachial plexus but variations in the roots, trunks & cords are very rare. We present one such rare variation of the lateral cord of brachial plexus and a variation in formation of median nerve in right upper limb.

Case Report:

During the routine dissections a variation in the formation of lateral cord of the brachial plexus was found unilaterally on the right side of a male cadaver aged approximately 52 years. The lateral cord was found to be a continuation of anterior division of upper trunk (Fig. I). posterior cord formed by posterior division of all three

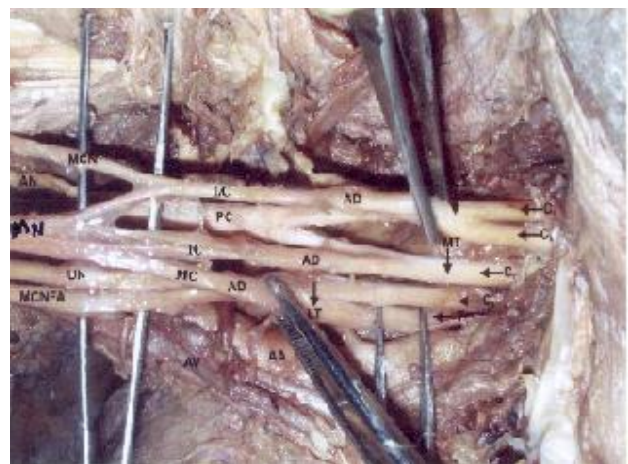


Fig. I: Showing variation in formation of lateral cord and median nerve of brachial plexus. C_5, C_6, C_7, C_8, T_1 ; roots of brachial plexus; UT: Upper trunk; MT: Middle trunk; LT: Lower trunk; AD: Anterior division; PC: Posterior division; LC: Lateral cord; IC: intermediate cord; MC: Medial cord; MCN: Musculocutaneous nerve; AN: Axillary Nerve; MN: Median nerve; UN: ulnar nerve; MCNFA: medial coetaneous nerve of forearm; AA: Axillary artery; AV: Axillary vein

trunks (Fig. II) and medial cord by anterior division of lower trunk (Fig. I)

In this case the anterior divisions of upper & middle trunk failed to join to form the lateral cord. Anterior division of middle trunk continued as intermediate cord (Uzun & Bilgic, 1999). Intermediate cord was intermediate between lateral & medial cord (Fig I). Median nerve contributed by lateral cord via lateral root (C_5, C_6), medial cord via medial root (C_8, T_1) and Intermediate cord (C_7).

Corresponding Author: Dr. Virendra Budhiraja, Assistant Professor in Anatomy, Subharti Institute of Medical Sciences, Delhi-Haridwar Bypass Road, Meerut-250002 (U.P.)

Phone No: 09897244802

E-mail: virendrabudhiraja@gmail.com

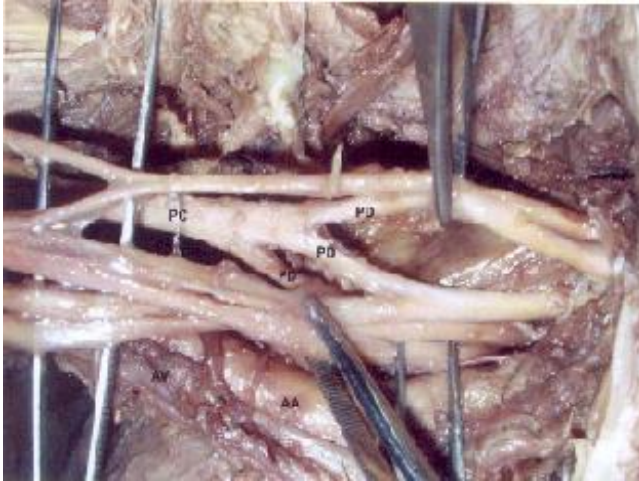


Fig. II: Showing formation of posterior cord of brachial plexus. PD: Posterior division ; PC: Posterior cord; AA: Axillary artery; AV: Axillary vein.

All the cords were lying lateral to second part of Axillary artery (Fig. I & II).

Discussion:

The brachial plexus is a large and very important plexus that is situated partly in the neck and rest in the axilla. Variations in the pattern of the plexus can be due to abnormal formation in the development of the trunks, division & cords. (Miller, 1934):

Walsh (1877) was the first to describe anatomical variations in the formation of brachial plexus in man. He reported an abnormal brachial plexus in 2 of the 350 plexuses.

Variation in formation of upper trunk as anatomical fusion of upper and middle trunk was reported by Nayak et al (2005)

Kerr (1918) noted an anomaly in the formation of the cords of plexus. The lateral cord apparently contained fibers from the 4th, 5th, 6th and 7th cervical spinal nerves. Uzun & Bilgic (1999) found that lateral cord was often formed by the 4th, 5th, 6th, and 7th cervical spinal nerves, and in few cases lateral cord only contained the anterior division of C₅ and C₆ of upper trunk.

In this case we found that lateral cord of brachial plexus is not formed by union of anterior division of upper and middle trunk rather it was found to be a continuation of anterior division of upper trunk which after giving a small lateral root of median nerve continued as musculocutaneous nerve. Anterior division of middle trunk continued as intermediate cord. (Uzun & Bilgic, 1999).

Variation of formation of median nerve by four roots, one from medial cord and three from lateral cord was noticed by Uzun & Seeling Leonard (Jr.) (2001).

In our case study we found that median nerve was originating from three sources i.e. lateral root carrying (C₅, C₆) fibers from lateral cord of brachial plexus, medial root carrying C₈T₁ fibers from medial cord of brachial plexus and intermediate cord carrying C₇ fibers. The variation found was on the right side.

The knowledge of variations in the formation of brachial plexus is very useful for the neurosurgeons. It will help in the surgical treatment of tumors of nerve sheaths such as schwannomas and neurofibromas. This knowledge might also help in treating the non neural tumors like lipoma. Orthopedic treatments of the cervical spine also need a thorough knowledge of the normal and abnormal formation of brachial plexus. Though the variation that we are reporting here may not alter the normal functioning of the limb of the person, It is very important in clinical neurosurgery and orthopedic procedures.

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