Two cord stage in the infraclavicular part of the brachial plexus

Case Report

Introduction
Variations of the brachial plexus occurs in the formation of trunks, divisions, and cords; in the origin and/or combination of branches; and in the relationship to the axillary artery and scalene muscles, however the make up of the terminal branches (components of the nerves) is unchanged [1]. The three cords of brachial plexus enter the axilla and are arranged according to their names around the second and third part of axillary artery. But in the first part of axillary artery, the relations are different; the lateral and posterior cords lie lateral to the axillary artery, whereas the medial cord lies behind the axillary artery [2].

The three trunks of the brachial plexus incline laterally, and either just above or behind the clavicle each bifurcates into anterior and posterior divisions. The anterior divisions of the upper and middle trunks form a lateral cord that lies lateral to the axillary artery. The anterior division of the lower trunk descends at first behind and then medial to the axillary artery and forms the medial cord, posterior divisions of all three trunks form the posterior cord, which is at first above and then behind the axillary artery [2].

Here a rare variation of two cord stage of the infraclavicular part of the brachial plexus representing anterior and posterior cords situated lateral to the axillary artery is reported. The clinical implications of this finding are discussed.

Case Report
During routine dissection of a 75-year-old embalmed male cadaver for undergraduate medical students in Department of Anatomy, PSG Institute of Medical Sciences and Research, Peelamedu, Coimbatore, India, a rare unilateral variation of the cords of the infraclavicular part of the brachial plexus was observed.

In the left upper limb of the cadaver, the pectoral region, axilla and arm were dissected. The axillary artery, axillary vein and the cords and the branches of the cords in the infraclavicular part of the brachial plexus were observed. Instead of the lateral, medial and posterior cords of the brachial plexus, only two cords, anterior and posterior was present lateral to the axillary artery and the anterior cord was representing the fusion of lateral and medial cords. The musculocutaneous nerve, median nerve, ulnar nerve, medial cutaneous nerve of arm and forearm were all originating from the anterior cord. The radial nerve and axillary nerve were originating from the posterior cord.

Discussion
A more precise knowledge about the distribution, course and the branching pattern of the nerves of the brachial plexus than that found in classical anatomical texts is necessary for clinical investigation and the surgical treatment of peripheral nerve injury [3]. The variation in the formation and branching of the brachial plexus are common and has been reported by Miller [4]. Kerr
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reported that, 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 [5]. The case reported here is in consonance with the report by Kerr, where there were only two cords as anterior and posterior, related laterally to the axillary artery. Embryologically the directional growth of nerve fibers is explained by the theory of neurotropism or chemotropism hypothesis of Ramon and Cajal [8]. The salient features of chemotropism is that axonal growth cones act as sensors to concentration gradients of molecules in the environment and grow up the gradient towards the source, i.e. the target. The variations of the cords of brachial plexus and its terminal branches become important during surgical exploration of the axilla and arm to avoid damage to the important nerves [9].

References