

A rare variation in the formation of the upper trunk of the brachial plexus - a case report

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ABSTRACT

Brachial plexus is the plexus of nerves that supplies the upper limb. Variations in the origin and distribution of the branches of brachial plexus are common but variation in the roots and trunks are very rare. Here, we report one of such rare variations in the formation of the upper trunk of the brachial plexus. In this case, the upper trunk was formed by the union of ventral rami of C5, C6 and C7 nerves. The middle trunk was absent and lower trunk was normal. *Neuroanatomy; 2005; 4: 37–38.*

Key words [brachial plexus] [upper trunk] [variation] [Erb's point] [spinal nerve]

Introduction

Brachial plexus is the plexus of nerves that supplies the structures in the upper limb. It is formed by the union of ventral rami of C5, C6, C7, C8 and T1 spinal nerves. The brachial plexus has roots, trunks, cords, divisions and branches. Variations are common in the branches of brachial plexus but the variations in the roots and trunks are very rare. The knowledge of such rare variations in the roots and trunks is very useful in the practice of orthopedics and anesthesia. We present one such rare variation of the trunks of brachial plexus in this report.

Case Report

During the routine dissections for medical undergraduates, a variation in the formation of upper trunk of the brachial plexus was found unilaterally on the right side of a male cadaver aged approximately 55 years. The upper trunk was formed by the union of ventral rami of C5, C6 and C7 spinal nerves (Fig 1). The middle trunk was absent and the lower trunk was formed by the union of ventral rami of C8 and T1 spinal nerves. The abnormal upper trunk was cleaned thoroughly to rule out the fascial connection between the upper and middle trunks. The abnormal upper trunk passed laterally between the scalenus anterior and medius muscles (Fig 2). After giving the two branches, suprascapular nerve and nerve to subclavius, the trunk divided into two divisions (Fig 2). These two divisions divided again into anterior and posterior division, which further coursed like the divisions of normal upper and

middle trunks. The rest of the parts of the brachial plexus were normal.

Discussion

The brachial plexus variations could fail the brachial plexus loco-regional anesthesia. In the surgical treatment of brachial plexus lesions, the surgeon must know brachial plexus anatomical variations perfectly. Common variations in the formation, prefixed and postfixed plexuses have been well documented [1–4]. Variations in the formation of the trunks of the brachial plexuses have been reported [4]. An extensive study by Uysal et al., (2003) showed superior trunk not being formed in 1% of cases, inferior trunk not being formed in 9% of cases and formation of superior trunk by C4 and C5 roots and formation of inferior trunk by T1 and T2 roots [5]. Formation of upper trunk of brachial plexus by C5, C6 and C7 roots is very rare. This will be associated with absence of the middle trunk. We can also put this case as anatomical fusion of upper and middle trunks. One such case has been reported so far where the fusion between upper and middle trunks was bilateral [4]. In the previous studies, the variations in the supra or infraclavicular part of brachial plexus were more frequent in the left side [4] but in our case, 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

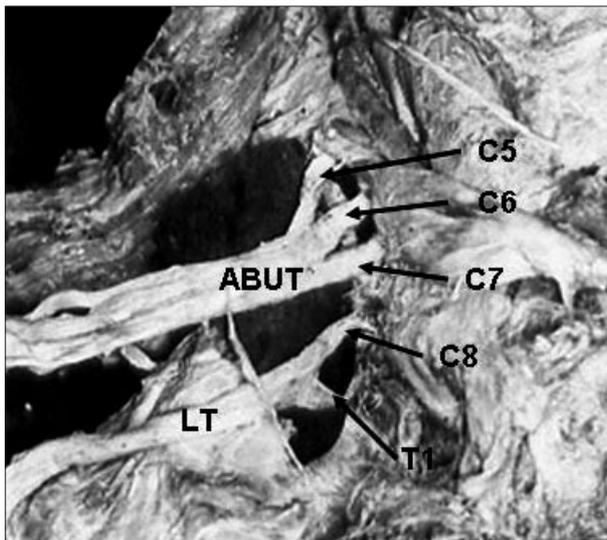


Figure 1. Formation of abnormal upper trunk of the brachial plexus. (*ABUT*: abnormal upper trunk; *C5, C6, C7, C8, T1*: roots of brachial plexus; *LT*: lower trunk)

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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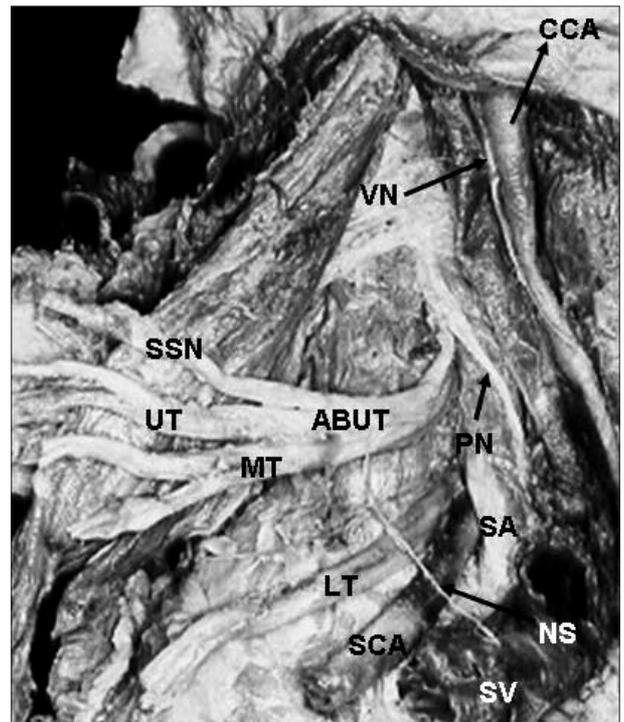


Figure 2. Abnormal upper trunk with its branches and relations. (*ABUT*: abnormal upper trunk; *SSN*: suprascapular nerve; *UT*: upper trunk; *NS*: nerve to subclavius; *SA*: scalenus anterior; *SM*: scalenus medius; *PN*: phrenic nerve; *CCA*: common carotid artery; *VN*: vagus nerve; *SV*: subclavian vein; *SCA*: subclavian artery)