

Bilateral anomalous suprascapular arteries

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SUMMARY

This study reports origins of the suprascapular artery from the third part of the axillary artery, bilaterally. The arteries, situated far below the clavicle, ascended upwards between the lateral and posterior cords of brachial plexus. The arteries joined the suprascapular nerves medial to the inferior belly of the omohyoid. The left and right arteries measured around 8 centimeters each, up to the suprascapular notch. On both sides, the nerves and vessels passed beneath the transverse scapular ligament. Other arteries around the scapula were normal. These vascular anomalies are rare and bear important surgical implications.

Key words: Subclavian artery – Suprascapular notch – Transverse scapular ligament

INTRODUCTION

The subclavian artery constitutes the main arterial supply of the upper limb in humans. The suprascapular artery usually originates from the thyro-cervical trunk of the first part of the subclavian artery before the latter crosses the outer border of the first rib and resumes its course as the axillary artery (Quain, 1844;

Adachi, 1928; Trotter et al., 1930; Hulke, 1959). The suprascapular artery passes transversely in the neck. It crosses laterally, superficial to the scalenus anterior muscle and the phrenic nerve. It proceeds behind the clavicle and the subclavius muscle and in front of all the cords of the brachial plexus. The artery then turns posteriorly, crossing the cords of brachial plexus superficially, towards the suprascapular notch. The suprascapular nerve joins the artery near the lateral half of the superior border of the scapula. Subsequently, the suprascapular artery passes above the suprascapular ligament and the nerve passes below the ligament through a tunnel formed by the suprascapular notch and the ligament situated across and above the notch (Adachi, 1928; Williams et al., 1995). The axillary artery is closely related to the pectoralis minor muscle as the upper part of this muscle passes in front of the artery. Variations regarding the branching of the subclavian artery have been observed and documented. The suprascapular artery has been reported to originate from the third part of the subclavian artery and from the internal thoracic artery (Bean, 1905; Reed and Trotter, 1941). The origin of suprascapular artery from the axillary and dorsal scapular artery has also been reported (Daselcor and Anson, 1959; Saadeh, 1979).

CASE REPORT

The bilateral origins of the suprascapular arteries from the third part of the axillary artery distal to its relation to the pectoralis minor muscle were observed during routine dissection in a male cadaver of 68 years by undergraduate students at Sri Aurobindo Institute of Medical Sciences, Indore, India. These arteries originated from the supro-dorsal aspect of the axillary arteries opposite to the origin of the subscapular arteries on both the sides. These vessels ascended upwards between the lateral cord of the brachial plexus anteriorly and the posterior cord placed behind it (Fig. 1a). The arteries measured approximately eight centimeters in length (right) and seven centimeters (left) up to the suprascapular notch. The artery accompanied the suprascapular nerve at the upper border of the subscapularis muscle lateral to the origin of the inferior belly of the omohyoid. On both the sides, the suprascapular nerves and the arteries and veins passed beneath the supras-

capular ligaments (Fig. 1b). The anomalous artery on the left provided twigs to the subscapularis muscle and a branch to the shoulder joint. On its subsequent course, the artery and the nerve traversed the supraspinous and the infraspinous fossae, passing through the spinoglenoid notch. The origins of the other branches of the axillary arteries and the formation of the dorsal scapular arterial anastomosis were normal.

DISCUSSION

The suprascapular artery provides major supply to the supra and the infraspinatus muscles. These muscles constitute parts of the rotator cuff at the shoulder joint. The dorsal scapular arterial anastomosis provides an arterial supply to the dorsal scapular muscles and forms an alternate route of circulation between the proximal subclavian and the distal axillary vessels (Ringel, 1990; Williams et al., 1995). In usual circumstances, the suprascapular, the

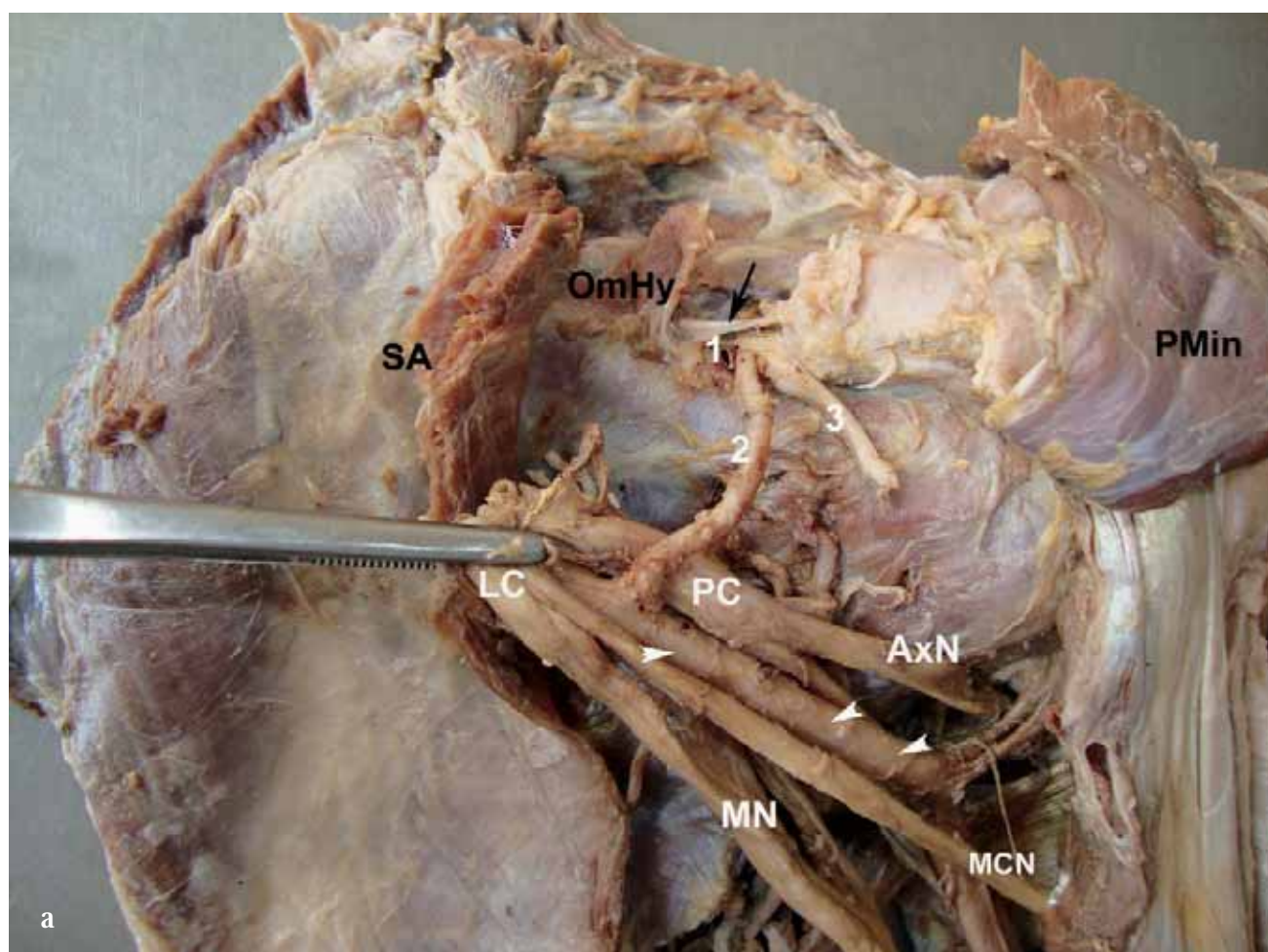


Figure 1 (a). The anomalous artery on the left side. 1= Suprascapular vein, 2= Suprascapular artery, 3= Suprascapular nerve. Muscles are shown as SA= Serratus anterior, OmHy= Inferior belly of Omohyoid and PMin= Pectoralis Minor. Axillary artery is shown with arrow heads. LC= Lateral cord, PC= Posterior cord of the brachial plexus, MN= Median nerve, MCN= Musculocutaneous nerve, AxN= Axillary nerve. Arrow indicates transverse scapular ligament and arrowheads show the course of the axillary artery.

dorsal scapular and the descending branches of the transverse cervical arteries comprise the subclavian components of this anastomosis, whereas the circumflex scapular branch of the subscapular artery contributes the axillary component of the anastomosis. The suprascapular artery in this case represented the axillary artery instead of the subclavian artery. These anomalous arteries did not pass superficial to the brachial plexus but ascended between its lateral and posterior cords. Although origin of suprascapular artery from the axillary artery has been reported previously (Bean, 1905; Reed and Trotter, 1941; Hulke, 1959), the present findings are extremely rare since (a) the anomalous origins were bilateral; (b) the arteries arose from the distal third of the axillary artery (at the level of the subscapular artery) (Quain, 1844; Ming-Tzu, 1940), and (c) they passed between the cords of the brachial plexus (Adachi, 1928;

Lengele and Dhem, 1989). The subclavian artery develops from the lateral branch of the seventh intersegmental artery (Williams et al., 1995). This artery advances distally inside the growing limb as a terminal plexus. A single axial artery represents the main continuation of the subclavian artery. All branches derived from the axial artery are carved out from multiple, plexiform and anastomotic sources from the main arterial trunk. Some of the channels of these articular networks persist due to functional dominance whereas others regress and disappear. The present case may have resulted from a proximo-distal mode of the suprascapular artery anomalous origin. This occurs due to the persistence of certain distal arterial plexus in the developing arterial network around the scapular segment of the axial artery. The passage of the suprascapular nerve, the artery and vein beneath the transverse scapular ligament has been reported earlier

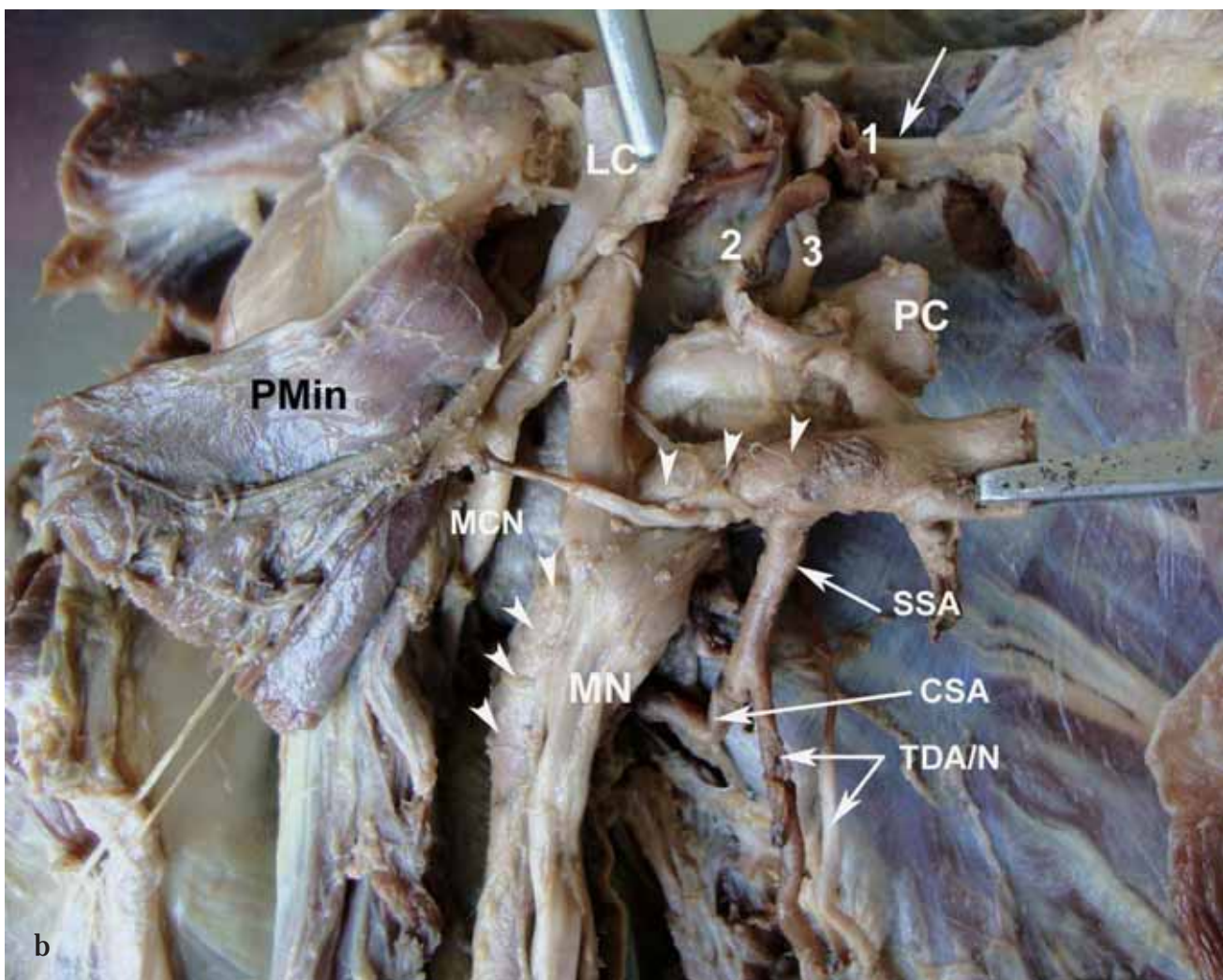


Figure 1 (b). Dissection of the vessel on the right side. 1= Suprascapular vein, 2= Suprascapular artery, 3= Suprascapular nerve. Muscles and cords of brachial plexus abbreviated as in Fig. 1a. SSA= Subscapular artery, CSA= Circumflex scapular artery, TDA/N= Thoracodorsal artery / nerve. Arrow= transverse scapular ligament, arrowheads= Axillary artery.

(Determe et al., 1966). This may cause an entrapment of the nerve, causing suprascapular neuropathy. The vasa nervosum of the suprascapular nerve may be disrupted due to a compromise of the circulation in the suprascapular artery, leading to a neuropathic situation (Ringel et al., 1990). Kinking of the axillary artery in a situation like this may result in extreme depletion in vascular supply to the rotator cuff by the anomalous suprascapular artery (Determe et al., 1966). A secondary spasmodic torticollis (Duran and Chacon, 2001) may appear as a presenting feature in such an anomaly. The awareness of the existence of such variations is important for diagnosing unexplained and rare clinical phenomena in affected persons or for planning surgical interventions around the scapula.

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