

Case Report

Subscapular Arterial Entrapment between Two Roots of Median Nerve with Concurrent Higher Division of Radial Nerve– A Case Report

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Abstract

Neurovascular variations in the axilla and the arm are quite common. Some of them are clinically significant and the knowledge about the same is handy during planning of a surgery in the region. We observed some neurovascular variations in the axilla and proximal part of the arm. The subscapular artery was sandwiched between the two roots of median nerve. It gave a common arterial trunk which divided into three branches; superior ulnar collateral artery, profunda brachii artery and a muscular branch. The radial nerve divided into its two terminal branches in the axilla. There is a possibility of compression of subscapular artery in this case as it passed between the two roots of median nerve.

Keywords: Subscapular artery, median nerve, profunda brachii artery, superior ulnar collateral artery, arterial entrapment, radial nerve

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Introduction

The axillary artery is the continuation of subclavian artery. In the axilla it gives six branches and the subscapular artery is the largest among them. It usually arises from the third part of the axillary artery, runs down on the posterior wall of axilla along the inferior margin of the subscapularis muscle and divides into two branches; circumflex scapular and thoracodorsal arteries. It mainly supplies the muscles attached to the scapula (1).

The profunda brachii artery is usually a branch of brachial artery. It accompanies the radial nerve to the radial groove where it divides into two terminal branches; anterior descending and posterior descending branches. It supplies the humerus and the muscles of the arm and takes part in the anastomosis around the elbow joint. It may originate from a common origin with the posterior circumflex humeral artery, or from axillary artery (1).

The superior ulnar collateral artery is usually a branch of brachial artery, given off in the arm. It takes part in the anastomosis around the elbow joint.

The radial nerve is the thickest branch of the brachial plexus. It is a branch of the posterior cord of brachial plexus. It enters the arm by passing through the lower triangular space accompanied by profunda brachii artery. After running through the radial groove, the nerve enters the anterior compartment of the arm by piercing the lateral intermuscular septum. It divides into superficial and deep branches between brachialis and brachioradialis muscles (2).

The subscapular artery may also be used in microvascular grafts to replace any damaged parts of the arteries in the hand and forearm (3).

We observed a rare case of concurrent variations involving entrapment of subscapular artery between two roots of median nerve followed by its variant

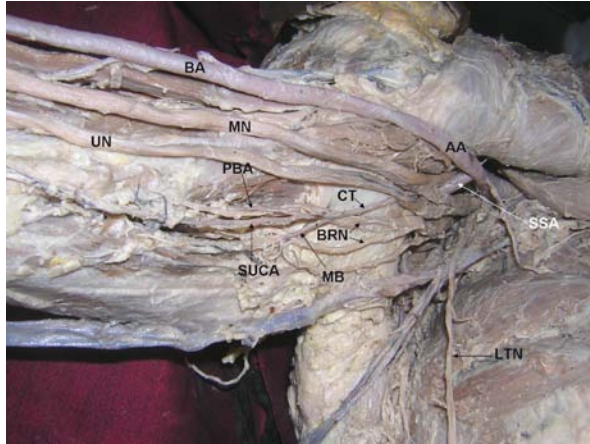


Figure 1: Dissection of the axilla and the proximal part of the arm. (AA – axillary artery; BA – brachial artery; SSA – subscapular artery; MN – median nerve; UN – ulnar nerve; CT – common arterial trunk dividing into three branches; BRN – branches of radial nerve; PBA – profunda brachii artery; MB – muscular branch; SUCA – superior ulnar collateral artery; LTN – long thoracic nerve)

branching pattern and higher division of radial nerve in axilla itself. The neurovascular variation that we report here is rare and clinically imperative, as abnormal branching pattern of subscapular artery may lead to profuse bleeding during axillary node clearance procedures. Also, prior knowledge of high division of radial nerve is essential in plastic surgery, orthopedic surgery and anesthesiologists, as well.

Case Report

During routine dissection for medical undergraduate students, we observed the following variations in the right upper limb of a male cadaver, aged approximately 65 years. The subscapular artery passed between the two roots of the median nerve (Fig. 1 and 2). The portion of the artery was slightly narrowed where it was sandwiched between the two roots. An abnormal common arterial trunk arose from subscapular artery and entered the arm. In the arm, this trunk divided into superior ulnar collateral artery, profunda brachii artery and a muscular branch (Fig. 1 and 2). The radial nerve divided into its terminal branches in the axilla (Fig. 2) and both the terminal branches entered the radial groove. These variations were unilateral. All the other branches of the axillary artery were normal and there were no other notable variations in the axilla and the proximal part of the arm.

Discussion

Neurovascular variations in the axilla and arm are common. Axillary and brachial arteries are known to give additional abnormal branches. A case of division

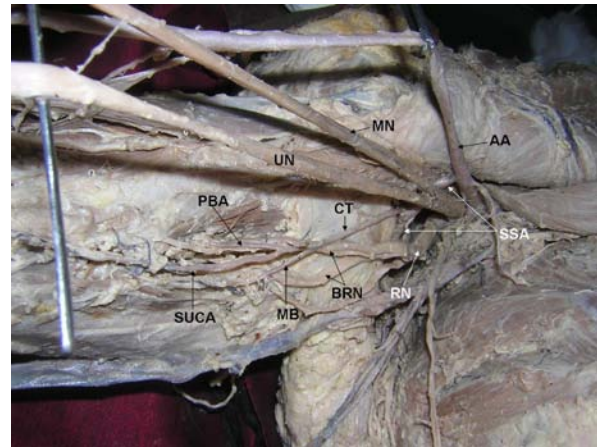


Figure 2: Closer view of the axilla and the proximal part of the arm showing concurrent neurovascular variations. (AA – axillary artery; SSA – subscapular artery; MN – median nerve; UN – ulnar nerve; CT – common arterial trunk dividing into three branches; RN – radial nerve; BRN – branches of radial nerve; PBA – profunda brachii artery; MB – muscular branch; SUCA – superior ulnar collateral artery)

of axillary artery into superficial and deep brachial arteries has been reported (4). Jurjus et al. (1999) have reported the presence of double axillary artery bilaterally (5). The subscapular artery is also known to show variations in its origin, course and branching pattern. Samuel et al. (2006) have reported the origin of subscapular artery from an abnormal trunk arising from axillary artery (6). This trunk divided into subscapular, posterior circumflex humeral, radial collateral, middle collateral and superior ulnar collateral arteries. Durgun et al. (2002) also reported the origin of posterior circumflex humeral artery from the subscapular artery (7). A case of subscapular artery passing between the two roots of median nerve has been reported earlier (8). However, its subsequent branching pattern was not unusual as we reported here. Venieratos and Lolis (9) have noted the origin of subscapular, profunda brachii, anterior and posterior circumflex humeral arteries and superior ulnar collateral artery arising from a common trunk coming from the axillary artery without any entrapment by the nerve roots.

Variations of radial nerve in the axilla are very rare. Radial nerve may be absent and in such cases musculocutaneous nerve supplies the area supplied by radial nerve (10). Radial nerve may be formed by the union of two roots coming from the posterior cord of brachial plexus. Subscapular artery may pass between such roots of radial nerve (11). In a study by Aktan et al. (2001) the radial nerve arose from the union of posterior divisions of inferior and middle trunks of brachial plexus and had no contribution from the superior trunk (12). High division of radial nerve such

as the one we are reporting here has not been reported yet. Prior knowledge of such rare case of higher division may be useful for the plastic surgeons and orthopedic surgeons in avoidance of iatrogenic damage to the nerve.

The neurovascular variations reported here may be important for the surgeons planning surgeries in the axilla. The abnormal arterial trunk arising from the subscapular artery may produce unexpected bleeding during the removal of axillary lymph nodes. The subscapular artery may get compressed between the two roots of the median nerve and it may lead to poor vascularization of the posterior wall of axilla and proximal part of the arm.

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