

# An Unusual Variation of Axillary Artery: A Case Report

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## ABSTRACT

An unusual unilateral variation was observed in branching pattern and course of branches of the axillary artery of the left upper limb in an adult male cadaver. The superior thoracic branch of axillary artery had a very unusual course as it passed between the two divisions of the lateral cord of the brachial plexus and then descended down towards the first two intercostal spaces. A common trunk was seen arising from the third part of the axillary artery which divided into anterior and posterior circumflex humeral, subscapular and Profunda brachii artery. The ulnar and radial collaterals arose from the Profunda brachii artery rather than the brachial artery. The knowledge about such variations becomes essential and of utmost significance in various clinical procedures performed by the vascular surgeons, radiologists and clinical anatomists. Moreover, the injuries of the brachial plexus are quite common and require exploration and repair. During such repair surgeries the abnormal arterial branch may be a matter of definite concern if its presence is not kept in mind.

**Keywords:** Axillary artery, Common subscapular trunk, Superior thoracic artery

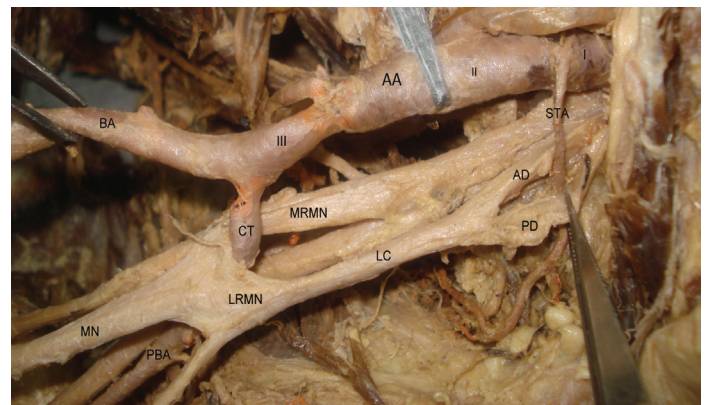
## CASE REPORT

During the routine dissection of the left upper limb in an adult male cadaver, variations in branching patterns were noted. The branching pattern of the axillary artery and the course of the branches of the axillary artery showed a variation which was observed in the branches of 1<sup>st</sup> and 3<sup>rd</sup> part. There was no variation in the 2<sup>nd</sup> part.

**FIRST PART:** Superior thoracic artery was seen to arise from the lateral aspect of the 1<sup>st</sup> part. It coursed between the two divisions forming the lateral cord of the brachial plexus as shown in [Table/Fig-1]. It then continued downwards towards the axilla passing posterior to the cords of the brachial plexus and second part of the axillary artery and here it divided into two branches. The superior branch travelled down and entered the first intercostal space to supply it. The inferior entered the second intercostal space to supply it.

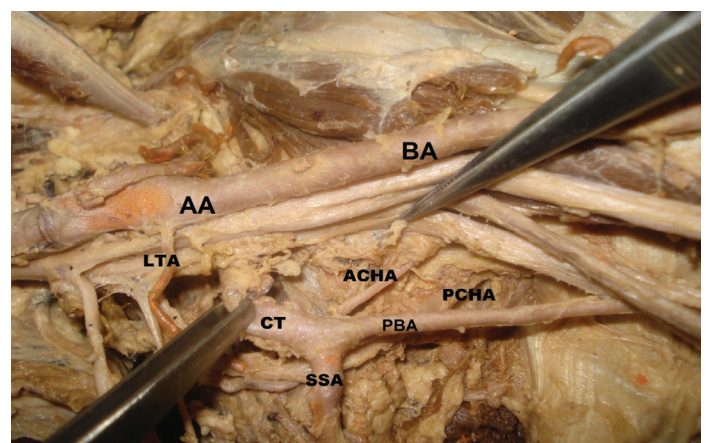
**SECOND PART:** The lateral thoracic artery was seen arising from the inferomedial aspect of the artery and acromiothoracic artery arose from the anteromedial aspect of the artery. Their branching pattern did not show any variation.

**THIRD PART:** A common trunk was seen arising from the inferolateral aspect of the third part as shown in [Table/Fig-2]. This common trunk passed between the two roots of the median nerve as seen in [Table/Fig-1]. It travelled downwards behind the medial root of the median nerve and the ulnar nerve. Just below its origin, the radial nerve was seen crossing this common trunk inferomedially. Approximately 5cm from the origin, the common trunk divided into various branches- a subscapular artery, anterior circumflex humeral and a posterior circumflex humeral artery [Table/Fig-2]. The main trunk continued as the Profunda brachii artery which was seen entering the radial groove along with the radial nerve. Here, it divided into 3 to 4 branches which supplied the triceps muscle. The superior ulnar collateral branch was also seen arising from the main trunk just before it entered the radial groove [Table/Fig-3]. This artery was seen running with the ulnar nerve till the elbow and ended by supplying the elbow joint. The inferior ulnar collateral artery arose from the superior ulnar collateral artery and thereafter took a normal

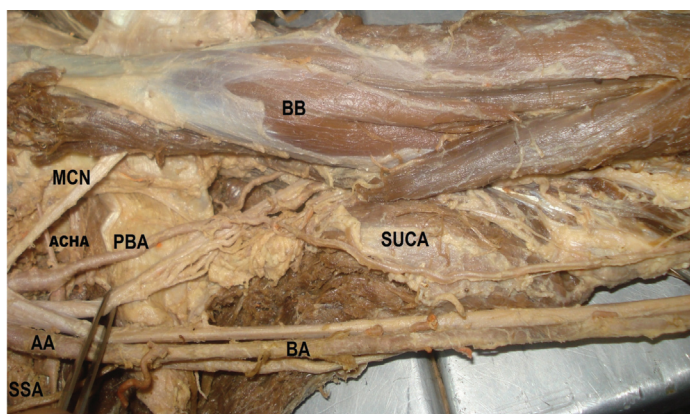


Superior view- arm extended of left axilla

**[Table/Fig-1]:** Shows superior thoracic artery and the common trunk. I, II, III- parts of left axillary artery (AA). STA- superior thoracic artery, AD- anterior division, PD- posterior division, LC- lateral cord, CT- common trunk, MRMN- medial root of median nerve, LRMN- lateral root of median nerve, MN- median nerve, PBA- profunda brachii artery, BA- brachial artery



**[Table/Fig-2]:** Shows the common trunk from the left axillary artery (AA) dividing into various branches. ATA- acromiothoracic artery, LTA- lateral thoracic artery, CT- common trunk, ACHA- anterior circumflex humeral artery, PCHA- posterior circumflex humeral artery, SSA- subscapular artery, PBA- profunda brachii artery, BA- brachial artery



Left axilla- anterior view

**[Table/Fig-3]:** Shows superior ulnar collateral artery arising from the profunda brachii artery –PBA left side, AA-axillary artery, SUCA-superior ulnar collateral artery, BA-brachial artery, ACHA-anterior circumflex humeral artery, SSA-suprascapular artery, MCN- musculocutaneous nerve, BB-biceps brachii muscle

course. The third part itself continued as the brachial artery into the arm but gave no branches in the arm [Table/Fig-3]. No such variations were noted in the right upper limb.

## DISCUSSION

The Axillary artery, a continuation of the subclavian artery, begins at the outer border of the first rib. At the inferior border of teres major it continues as the brachial artery. Pectoralis minor crosses axillary artery and divides it into three parts which are proximal, posterior and distal to the muscle [1].

Conventionally, the proximal (first part) gives superior thoracic artery. The posterior (second part) gives thoraco-acromial and lateral thoracic arteries. The distal (third part) gives subscapular artery, anterior and posterior circumflex humeral arteries [1].

It is not uncommon to find variations in the branching pattern of the axillary artery. Many of its branches may arise by a common trunk or a branch of the named artery may arise separately [2]. The vascular variations of the region should be well known [3]. The course and branching pattern of the axillary artery vary with race, sex and ethnic groups [3,4].

To correctly diagnose any underlying pathology in the axilla, it is very essential to have accurate knowledge of the normal and variant anatomy of the axillary region. This knowledge becomes the prerequisite for the subsequent clinical procedures of utmost significance for the vascular surgeons, radiologists and clinical anatomists [5]. Angiography is the procedure of choice; however, the term has been applied to newer vascular imaging techniques such as CT angiography and MR angiography. Isotope angiography or Isotope perfusion scanning has also been used for studying vessels.

Twenty three different types of axillary artery on the basis of the origins of the branches have been described. There is a greater tendency in the Negro than in the white persons towards clumping of the branches and arising in common [6].

The first part of axillary artery in rare cases, give rise to the subscapular artery or supply branch to the subscapular muscles [7].

Similar other variable patterns of branches from first and third part of axillary artery have been found in different cases, few of them have been tabulated in [Table/Fig-4].

In the present study the superior thoracic artery arising from the lateral aspect of the first part took a very unusual course by passing between the two divisions of the lateral cord of the brachial plexus. This type of variation has not been reported earlier. The anterior circumflex, posterior circumflex and profunda brachii did not arise from the third part of Axillary artery but rather came from the common trunk. The ulnar and radial collateral arteries also were

S. No	Author	Year	Findings
1	Veneratos and Iolis [8]	2001	Common subscapular trunk from third part of axillary artery giving various branches.
2	Saeed et al., [3]	2002	Aberrant subclavian artery and variant branching pattern of the axillary artery
3	Samuel et al., [9]	2006	A common trunk from third part of axillary artery dividing into various type branches
4	Vijaya Bhaskar [10]	2006	Third part of axillary artery divided into superficial and deep brachial arteries, deep divided into various branches.
5	Ramesh Rao T et al., [11]	2008	A common trunk from the third part which dividing into subscapular, anterior and posterior circumflex humeral, profunda brachii arteries and ulnar collateral arteries on left side
6	Vasudha et al., [12]	2008	Superior thoracic and collateral branch from first and no branches from rest of the axillary artery.
7	Syed Rehan [13]	2010	Thoraco acromial artery from first and second part and two posterior circumflex humeral arteries from the third part.
8	Kumar N et al., [14]	2014	Profunda brachii artery from 3 <sup>rd</sup> part of the axillary artery.

**[Table/Fig-4]:** Represents variations of first and third part of axillary artery found in different studies by different authors

not seen arising from the brachial artery but instead from profunda brachii artery.

The knowledge of these variations is necessary for the surgeons considering the frequency of procedures performed in this region. The increasing use of invasive, diagnostic and interventional procedures in cardiovascular diseases makes it important that the type and frequency of vascular variations are well documented and understood. Branches of the upper limb arteries have been used for coronary bypass and flaps in reconstructive surgery. Absence or variations of branches of axillary artery is responsible for compromised collateral circulation between first part of subclavian and third part of axillary artery in case of a blockage. A branch of axillary artery passing between the cords of brachial plexus like in this case can get compressed between the two roots leading to no or reduced blood supply to the concerned tissue ultimately leading to its death and necrosis. Moreover brachial plexus injury is a common condition which requires exploration and repair. During surgery the abnormal branch may be a definite cause of concern if its presence is not kept in mind [15,16].

## CONCLUSION

Awareness about depth and topographic anatomy of deviations of axillary artery may possibly serve as a helpful information for radiologists, plastic surgeons and vascular surgeons. It may help to prevent diagnostic errors, influence surgical tactics and interventional procedures and avoid complications during the surgery of the axilla region like abscess drainage and protection of axillary artery in breast cancer surgery etc. In our case study we found an unusual variation of axillary artery which should help our medical fraternity.

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