

Common Arterial Trunk from Third Part of Axillary Artery

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PRESENTATION OF CASE

During usual dissection of the upper extremity for the first year MBBS students in the Department of Anatomy, we observed unilateral variant branching pattern of third part of axillary artery on the right side in a middle aged male cadaver. Course and branching pattern of first, second and third part of axillary artery on the left side was found to be normal. On the right side also, course and branches of axillary artery were found to be normal in its first and second part but axillary artery in its third part divided into two equal calibre arterial trunks lateral and medial. Lateral common arterial trunk courses laterally for a distance of 1 cm and then passes through two roots of median nerve. Further in its course it gives three branches, anterior circumflex humeral from anterolateral aspect, posterior circumflex humeral from posterolateral surfaces and subscapular artery from anteromedial surfaces and the trunk continues as profunda brachii artery which runs along with radial nerve through radial groove. Superior and inferior ulnar collateral artery arose from the profunda brachii artery instead of brachial artery, while medial trunk courses downwards medial to median nerve in arm. It continues as brachial artery at the lower border of teres major muscle and doesn't give any branch in its further course in arm. The trunk divides into two terminal branches, radial and ulnar artery at the radial tuberosity.

Subclavian artery courses from the external border of clavicle to the lower edge of teres major muscle as axillary artery. It is partitioned by the covering of pectoralis major muscle into three sections. It offers six branches, one from the initial segment, two from the subsequent part and three branches from the third part of the artery. Superior thoracic emerges from initial segment, thoraco-acromial and long thoracic artery conduit from the subsequent part and anterior circumflex humeral, posterior circumflex humeral and subscapular artery from the third part of axillary. Two roots of median nerve embrace the third part of axillary artery and join with each other to form the trunk of nerve which is usually related to the lateral aspect of the axillary artery.¹ Nerves as well as vessels during their course to the area of concern, may contravene the usual course and exhibited as variant distribution. Variation in the course of neurovascular bundle, the main content of the axilla, has been documented by many researchers. This is a unique instance of variation of third part of axillary artery.

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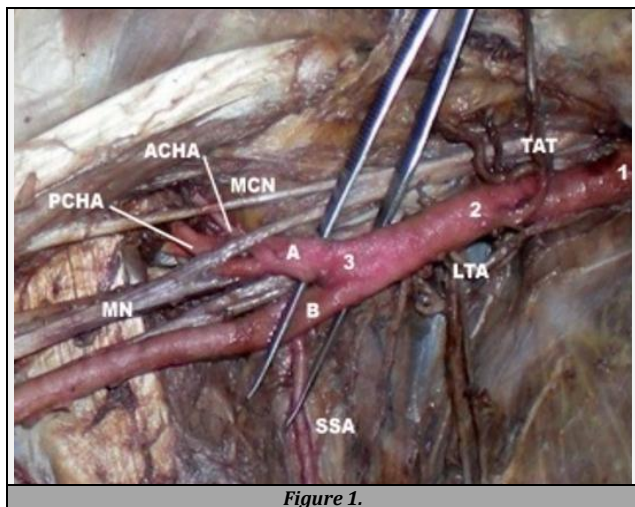


Figure 1.

Showing division of third part of axillary artery into two equal calibres arterial trunk A and trunk B passing between two roots of median nerve LTA-Lateral Thoracic Artery, ACHA-Anterior Circumflex Humeral, PCHA-Posterior Circumflex Humeral, SSA-Subscapular, PBA-Profunda Brachii Artery, MN-Median Nerve (Figure 1)

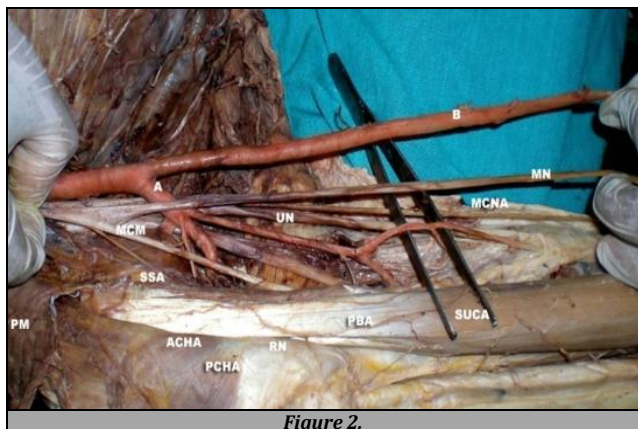


Figure 2.

Showing branches from common arterial trunk B giving origin to ACHA, PCHA, SSA, PBA and PBA artery giving origin to ulnar collateral artery, LTA, ACHA, PCHA, SSA, PBA, MN, SUCA-Superior Ulnar Collateral Artery, UN-Ulnar Nerve (Figure 2)

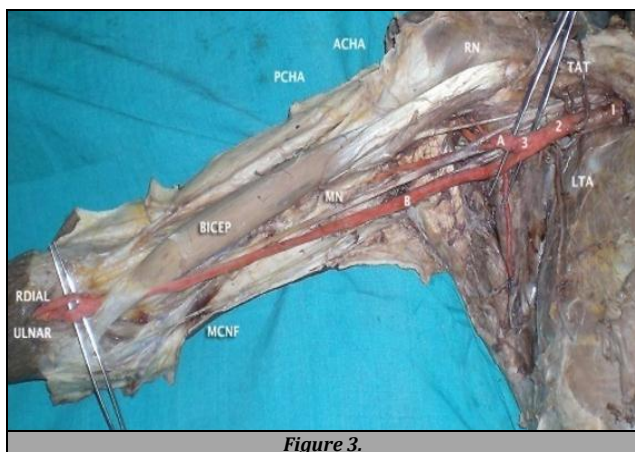


Figure 3.

Showing continuation of Trunk-A in arm and its further division in to radial and ulnar artery LTA, ACHA, PCHA, SSA,

PBA, MN, SUCA, UN, MCNA-Medial Cutaneous Nerve of arm (Figure 3).

DISCUSSION

Varieties in the branches emerging from axillary artery have been recorded by many authors. De Garis and Swartley (1928) reported five to eleven branches emerging from the axillary artery however the commonest number in reading material of anatomy are six branches, one branch from initial segment, two from second part, and three from third part of axillary artery.² Branches from the axillary artery emerged independently or as a common arterial trunk from any of the three part of axillary artery.³ Variant common arterial trunk arising from axillary artery was documented by many authors. Common arterial trunk arising from first part of axillary artery giving origin to branches that normally originate from second and third part of axillary artery were observed by E M Goldman (2012) and Deepak Patil (2016).^{4,5} Common arterial trunk arising from second part and dividing into branches that normally arises from the second or third part were documented by Saeed M (2002) T Srimathi (2011) Ranjana Verma (2014) Javed Akhtar (2016).^{6,7,8,9}

Authors	Year	Part of the Axillary Giving Origin to Common Arterial Trunk	Branches from Common Arterial Trunk
E M Goldman et al.	2012	First part	TAA, SSA giving Origin to PCHA, LTA
Deepak Patil et al.	2016		ACTH, PCHA, SSA, PBA
Saeed M et al.	2002		LTA, CHA, SSA, TDA
T Srimathi et al.	2011	Second part	Thoracohumeral Trunk (1.9 %)
Ranjana Verma et al.	2014		TAA, LTA, SSA, PCHA
Javed Akhtar et al.	2016		TAA, SCA, Collateral Branch LTA, SSA
Saeed M et al.	2002		ACHA, PCHA, TDA
Divya Agrawal et al.	2012		Subscapular-Circumflex Humeral Trunk (3.8 %)
Ishwar B. Bagoji et al.	2013	Third part	LTA, SSA, PCHA, CSA, Muscular branch
Aritra Banerjee et al.	2017		CSA, LTA, TDA, PCHA
D Venieratos et al.	2001		Subscapular Trunk Roots of Median Nerve are Related to deep Brachial Artery
Samual VP et al.	2006		PCHA, LTA
Kumar Naveen et al.	2014	Third part	ACTH, PCHA, PBA, UCA
Aastha et al.	2015		ACTH, PCHA, SSA, RCA, MCA, SUCA
Our Findings	2020		ACTH, PCHA, SSA, PBA as Continuation
			CT pass between two Roots of Median Nerve
			ACTH, PCHA, SSA, PBA
			Ulnar and Radial Collateral from PBA
			ACTH, PCHA, SSA, PBA SUCA, IUCA from PBA

Table 1.

Showing common arterial trunks with various branches arising from the first, second, third part of the axillary artery as reported by different authors CT-Common Trunk, TAA-Thoracoacromial Artery, LTA, CSA-Circumflex Scapular Artery, TDA-Thoracodorsal Artery, ACTH- Anterior Circumflex Humeral, PCH-Posterior Circumflex Humeral, SSA, PBA, RCA-Radial Collateral, MCA-Middle Collateral, UCA-Ulnar Collateral Artery, SUCA-Superior Ulnar Collateral Artery, IUCA-Inferior Ulnar Collateral Artery (Table 1).

We detailed a common arterial trunk emerging from the third part which divides into three branches that normally are the branches of third part individually and continues as

profunda brachii artery. The profunda brachii artery in this case gave origin to collateral branches instead of brachial artery. Saeed M (2002) found common arterial trunk branching into ACHA, PCHA, TDA.⁶ Divya Agrawal (2012) found it branching into LTA, SSA, PCHA, CSA,¹⁰ Ishwar B. 2013 into CSA, LTA, TDA, PCHA¹¹ and Aritra Banerjee (2017) into PCHA, LTA. Samuel VP also documented a common arterial trunk, which gives origin to branches arising normally from the third part and in addition it gives origin to radial collateral, middle collateral and superior ulnar collateral arteries but with absence of profunda brachii artery¹². SAEED case this common trunk gives rise to subscapular artery, anterior and posterior circumflex humeral artery in addition to the lateral thoracic thoraco-acromial artery,⁶ but the course of profunda brachii was normal in that case. Samuel VP (2006) also reported a common trunk but unlike us observed RCA, MCA, SUCA arising from profundabrachii.¹³ Kumar Naveen (2014) Aastha also documented a common arterial trunk continuing as profunda brachii artery which gives ulnar collateral but unlike us it also gives radial collateral artery from the profunda brachii.^{14,15}

Degarais & Swartley and Huelke reported on the basis of large scale study on the branching pattern of axillary artery that the subscapular; both circumflex humeral and profunda brachii arteries arose frequently from the axillary artery as a common trunk in combination of any of two or more.² According to Eumet al, 1991 the profunda brachii artery arose occasionally from the axillary artery by a common trunk with the subscapular and both circumflex humeral arteries.¹⁶ Jonson stated that subscapular artery arises from common arterial trunk with posterior circumflex humeral artery in 30 % of cases. In some cases subscapular, circumflex humeral and profunda brachii arteries arise in common and was surrounded by branches of the brachial plexus.¹⁷ Regression, retention or reappearance of any vessels during embryonic development of vascular plexus of the upper limb result into formation of vas aberrans.¹⁸

Surgeons should be aware of the normal as well as the variant branching pattern of axillary artery to prevent accidental vascular injury during surgical intervention in the axillary region to avoid complication. In this case the common arterial trunk passes between two roots of median nerve and may get compressed between the roots leading to inadequate blood supply to the arm. Knowledge about the variation is also essential for orthopaedician during correction of shoulder dislocation.¹⁹ As the branches of axillary artery are used as graft of coronary bypass, vascular surgeons should be aware about the variant axillary artery branching pattern.

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Disclosure forms provided by the authors are available with the full text of this article at jemds.com.

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