

Variable Origin of Axillary Artery Branches in Indian Male Cadaver- A Case Report

N ESAKKIAMMAL¹, WMS JOHNSON², R ARCHANA³

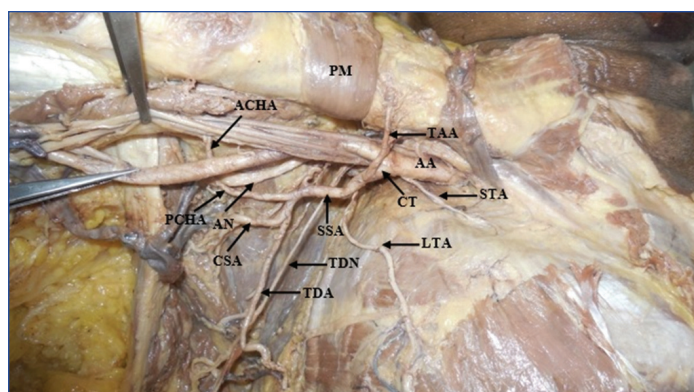
ABSTRACT

In clinical and surgical procedures, the variable origins of the axillary artery branches are significant for identifying uncommon signs and symptoms. The present case report documents an unusual origin of the axillary artery branches during dissection of a male cadaver in the Anatomy Department of an undergraduate and postgraduate teaching medical college in India. Normally, the superior thoracic artery arises from the first part of the axillary artery. In the present case, the second part of the axillary artery gave rise to a common trunk, from which the thoracoacromial, lateral thoracic, and subscapular arteries originated. Further, the thoracodorsal, circumflex humeral, and posterior circumflex humeral arteries originate from the subscapular artery whereas the anterior circumflex humeral artery only originates from the third part of the axillary artery. During surgical procedures performed in the region of the axilla, anatomists, radiologists, and cardiologists need to be aware of variations in the origin of axillary artery branches.

Keywords: Cardiovascular surgeries, Common trunk, Subscapular artery

CASE REPORT

In the present case, a variation in the origin of branches of the axillary artery was noted on the right side of the upper limb in the formalin-fixed male cadaver during routine dissection in the Department of Anatomy, an undergraduate and postgraduate teaching medical college in India. Normally, the superior thoracic artery arises from the first part of the axillary artery but in the present case, common trunk arose from the second part of the axillary artery and it divides into thoracoacromial, lateral thoracic and subscapular arteries. The thoracodorsal, circumflex scapular and posterior circumflex humeral arteries originate from the subscapular artery. The 3rd part of the axillary artery gives rise to the anterior circumflex humeral artery only in the present case [Table/Fig-1].



[Table/Fig-1]: The right side of the upper limb shows variation in the origin of branches of the axillary artery.

PM: Pectoralis minor; AA: Axillary artery; STA: Superior thoracic artery; CT: Common trunk; TAA: Thoracoacromial artery; LTA: Lateral thoracic artery; SSA: Subscapular artery; TDA: Thoracodorsal artery; TDN: Thoracodorsal nerve; CSA: Circumflex scapular artery; PCHA: Posterior circumflex humeral artery; AN: Axillary nerve; ACHA: Anterior circumflex humeral artery

DISCUSSION

Clinically, the variable origin, course, and branches of the axillary artery are of great significance. According to Gray's Anatomy textbooks, normally the superior thoracic artery arise from its 1st part, the lateral thoracic and thoracoacromial arteries arise from the 2nd part, and the subscapular, anterior circumflex humeral, and posterior circumflex humeral arteries arise from the 3rd part of the axillary artery; further, the subscapular artery is divided into circumflex scapular and thoracodorsal arteries [1]. Previously, the literature reported numerous variations in the origin and morphology of axillary

artery branches [2,3]. Many branches of the axillary artery exhibit significant variation, and two or more normal branches may originate from a common trunk or named artery like- the deltoid, acromion, clavicle, or pectoral branch may come from the axillary artery [4].

The superior thoracic artery arose from the first part of the axillary artery as it is usual on the right side of the upper limb. However, its second part gave rise to a common trunk that was divided into the lateral thoracic and subscapular arteries. The anterior and posterior circumflex humeral arteries originate from the third part of the artery [5]. As reported by Naqshi BF et al., the common thoraco-humeral trunk arises from the second part of the axillary artery, and it gives off lateral thoracic, subscapular, thoracodorsal, anterior and posterior circumflex humeral arteries on the right side [6].

According to Ezzati M et al., the axillary artery branches have variable origins, and they found that the second part of the right axillary artery gave rise to a common trunk and was divided into the lateral thoracic and subscapular arteries, and then the thoracodorsal, circumflex scapular, and posterior circumflex humeral arteries arose from the subscapular artery. The final branch of the axillary artery was the anterior circumflex humeral artery, which was the only branch of the third part [7]. In addition to this, the thoracoacromial artery also arises from the common trunk along with the lateral thoracic and subscapular arteries in the present case. This type of variation has not been reported so far. According to some authors, the third part of the axillary artery forms a common trunk on the right side of the upper limb, which is enumerated in [Table/Fig-2] [5-10].

Gaur S et al., reported that in 4% of cases, the subscapular artery is found to arise from the 2nd part of the axillary artery, and in upto 30% cases, it arises from a common trunk with the posterior circumflex humeral artery. Variations are observed most often in the 3rd part of the axillary artery and rarely in the 1st part [11]. In the current case, no variations were found in the 1st part of the axillary artery. However, variants were observed more commonly in the 2nd and 3rd parts of the axillary artery on the right side upper limb.

When performing a surgical bypass between the axillary artery and subclavian artery to treat subclavian artery occlusion, the axillary artery has varying branch patterns that should be considered. In cardiopulmonary bypass, thoracic and aortic procedures, the axillary arteries have been successfully used as cannulation sites for intra-aortic balloon pumps, and they are now being considered as an inflow vessel in coronary artery surgery [12]. Moreover, it

Author and year of study	Place of the study	Side of the upperlimb	Variation in part of the axillary artery
Shantakumar SR and Mohandas Rao KG (2012) [5]	Manipal	Right	Second
Naqshi BF et al., (2015) [6]	Jammu	Right	Second
Ezzati M et al., (2018) [7]	Iran	Right	Second
Banerjee A et al., (2017) [8]	Delhi	Right	Third
Singh R (2017) [9]	Uttarakhand	Right	Third
Aastha et al., (2015) [10]	Punjab	Left	Third
Present case report	Tamil Nadu	Right	Second

[Table/Fig-2]: Comparison of the origin of the common trunk in the present observation with that of previous author's reports [5-10].

is important to acknowledge and appreciate such a variation in radiographic procedures in order to enhance accuracy and reduce potential complexity [13].

Developmentally, variations in axillary artery branching might be caused by deviations in the vascular plexus of the upper limb buds. The axillary artery originates from the seventh cervical intersegmental artery, and the axillary and brachial arteries arise from its proximal end. An evolutionary aberration causes a pattern of unusual branching. The variation may occur as a result of regression, retention, or reappearance of new vessels during the development of upper limb vessels [14].

CONCLUSION(S)

An abnormal origin or course of these blood vessels is usually accidentally discovered during imaging studies performed as part

of an investigation of the relevant clinical condition. However, the present report described the variable origin of axillary artery branches, and understanding these changes will help to prevent accidental damage to these vessels during surgeries.

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PARTICULARS OF CONTRIBUTORS:

1. PhD Scholar, Department of Anatomy, Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India.
2. Professor and Dean, Department of Anatomy, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India.
3. Associate Professor, Department of Anatomy, Sree Balaji Medical College and Hospital, Bharath Institute of Higher Education and Research, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. R. Archana,
Associate Professor, Department of Anatomy, Sree Balaji Medical College and Hospital,
Chennai-600044, Tamil Nadu, India.
E-mail: archanasambasivam@gmail.com

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