

VARIATIONS IN SUBSCAPULAR ARTERY: A STUDY

Pushpalatha M¹, Chitra N²

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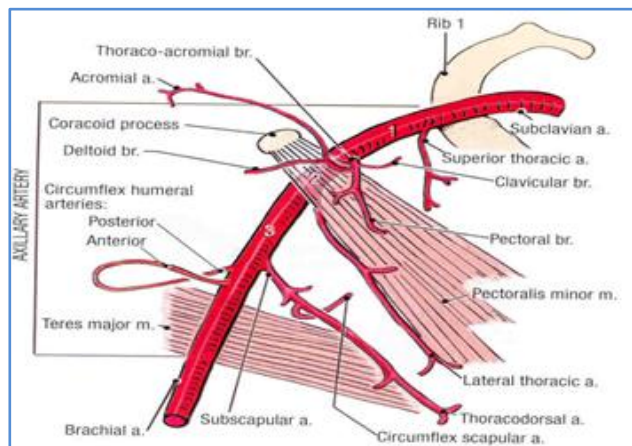
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ABSTRACT: OBJECTIVE: To study the variations in the origin of subscapular artery and its branches in the dissecting room. **METHOD:** The morphological study of 40 formalin fixed adult human cadavers of both sexes was carried out following a standard dissecting manual. **OBSERVATION:** Variations in origin of Subscapular artery was observed in 15% of the cadavers, origin from 2nd part of axillary artery in 15%, as a common branch with Lateral thoracic artery in 10%, associated variations of posterior circumflex humeral artery, thoraco dorsal artery and circumflex scapular artery in 10%. **CONCLUSION:** In comparison with other similar studies, the present one also shows a near to equal scenario which helps us to strengthen the already existing knowledge. Appreciation of these variations is important to vascular surgeons for vascular graft surgeries, general and on co-surgeons while exposure of axilla and axillary artery so also to radiologists and anatomists.

KEYWORDS: Axillary artery (AA), subscapular artery (SsA), variations, embryological aspect, vascular grafts.

INTRODUCTION: Axillary Artery (AA) is classically divided into 3 parts by the pectoralis minor muscle and conventionally described as giving of 6 branches. Superior thoracic from 1st lateral thoracic and acromiothoracic from 2nd, subscapular, anterior circumflex, posterior circumflex humeral from 3rd part.¹ The branches vary considerably in its origin upto 30% of the cases. The present study is concerned exclusively about the origin and divisions of subscapular artery.

Subscapular artery (SsA) supplies posterior axillary wall including the scapula and muscles covering its posterior aspect through anastomoses of the branches of the artery (circumflex scapular-CsA and thoracodorsal artery-TdA) with branches from the subclavian artery (suprascapular and transverse cervical).² It is accompanied distally by the nerve to the latissimus dorsi, about 4cms from its origin.



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Variations in the branching pattern of the axillary artery are a rule rather than an exception. The knowledge of these variations is of anatomical, surgical and radiological interest to explain unexpected clinical signs and symptoms.

METHODS: The morphological study of 40 formalin fixed adult cadavers of both sexes was carried out to observe the variations in origin and divisions of subscapular artery following a standard dissection manual.²

OBSERVATION: 1) Origin of SsA from 2nd part of AA noted in 15% of cases as against 85% arising from 3rd part which is a classical form. Similar observations noted in another study done by Poynter.³ 2) 15% arising as a common trunk with LTA, similar observations cited by many authors.^{3,4} 3) Posterior circumflex humeral Artery(PCHA) arising with SsA in 15% of cases. 4) Thoracodorsal artery (TdA) branch of SsA arising separately from the main trunk in combination with other branches in 10% of the cases.

DISCUSSION: Embryological development of the vascular system is complex and often results in diverse clinically relevant anomalies. Hence the origin, course and distribution of the principal arteries gain keen interest from anatomists, vascular surgeons, radiologists⁵ and cardiovascular surgeons. EMBRYOLOGICAL BASIS- Developmentally, the lateral branch of 7th inter segmental artery enlarges to form the main artery (axis artery) of the developing upper limb bud. The proximal part of this axial artery is recognized as axillary artery, followed by the brachial and interosseous arteries. Other arteries of upper extremities develop as sprouts.⁶ Due to their multiple and plexiform sources, the temporal succession of emergence of the principal arteries, anastomoses and periarterial networks, the anomalies of subclavian-axillary system are fairly common.⁷

Aizawa et al in a series of 202 dissections labeled the SsA in axilla as Subscapular artery system (Sbs system) and classified them into 3 groups; S type, I and P type.⁴ In the present study 15% of cases resembles S type. Similar figures are obtained with other studies.^{4,8,9} 1.9%, 15% showed posterior circumflex humeral with ScA from studies of Muhammad Saeed et al⁸ and Poynter⁹ respectively. 15% arising as a common trunk with LTA, similar figures observed in various other studies.^{3,4}

Subscapular artery is used as an arterial graft (Type1 of functional classification of arterial grafts). The branch of SsA- CsA which lies in dorsal thoracic fascia plays a significant role in the circulation of the overlying skin and subcutaneous tissues, the prime reason for its usage in wound closure with free fascia flaps or expanded cutaneous or myocutaneous flaps.¹⁰

CONCLUSION: Axillary vessels must be preserved in radical mastectomy, drainage of axillary abscess, management of fracture dislocation of the surgical neck of humerus and axillary lymph node biopsy. Anomalous origin and distribution of SsA and PCHA make them more vulnerable to trauma. Such aberrations may cause difficulty for invasive cardiologists in cannulation of right SsA performed for balloon aortic valvuloplasty in infants and for plastic surgeons in raising free flap of the serratus anterior for reconstruction. Therefore both the normal and variant anatomy of the region should be well known for accurate diagnosis and treatment.

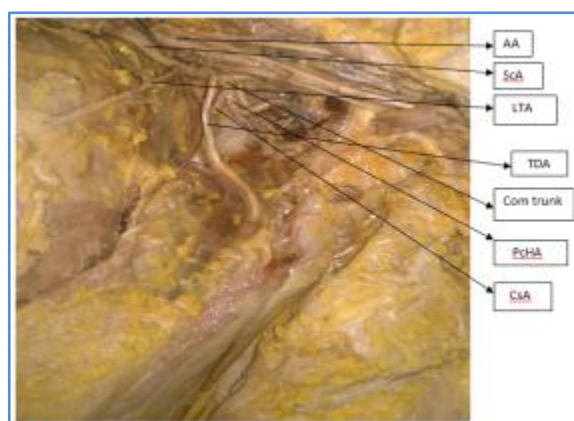


Fig. 1: ScA arising from 2nd part of AA, LTA, TDA arising separately, PCHA and CsA arising from a common trunk

	Present study	Other studies
Origin of ScA from 2 nd part of AA.	15%	15%
ScA arising with LTA as common trunk	15%	15%
PCHA arising with SsA	15%	10% (Poynter)
TDA arising as separate branch from main trunk	10%	4% (pointer)

Table 1

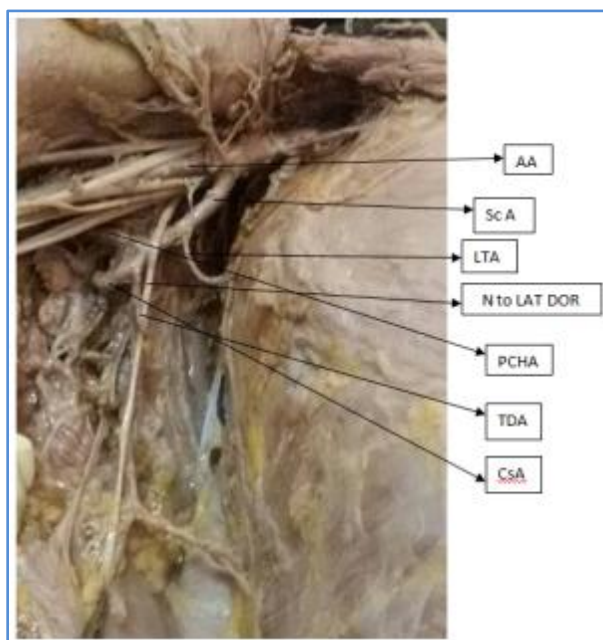


Fig. 2: Subscapular Artery arising from 2nd part of AA, LTA arising from SsA. PCHA, TDA and CsA arising as a common trunk

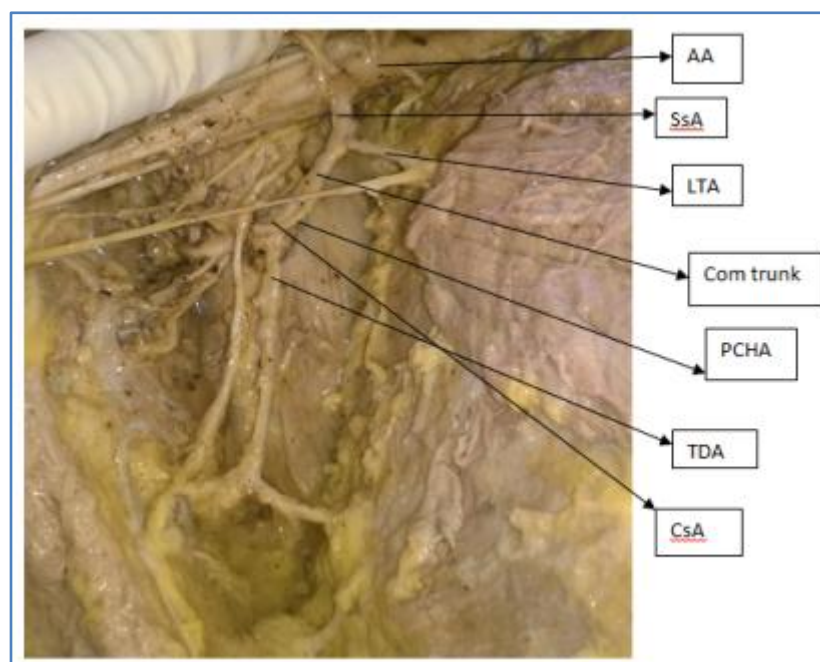


Fig. 3: Subscapular Artery arising from 2nd part of AA. LTA arising as branch of SSA. PCHA, TDA, CsA, arising from a common trunk

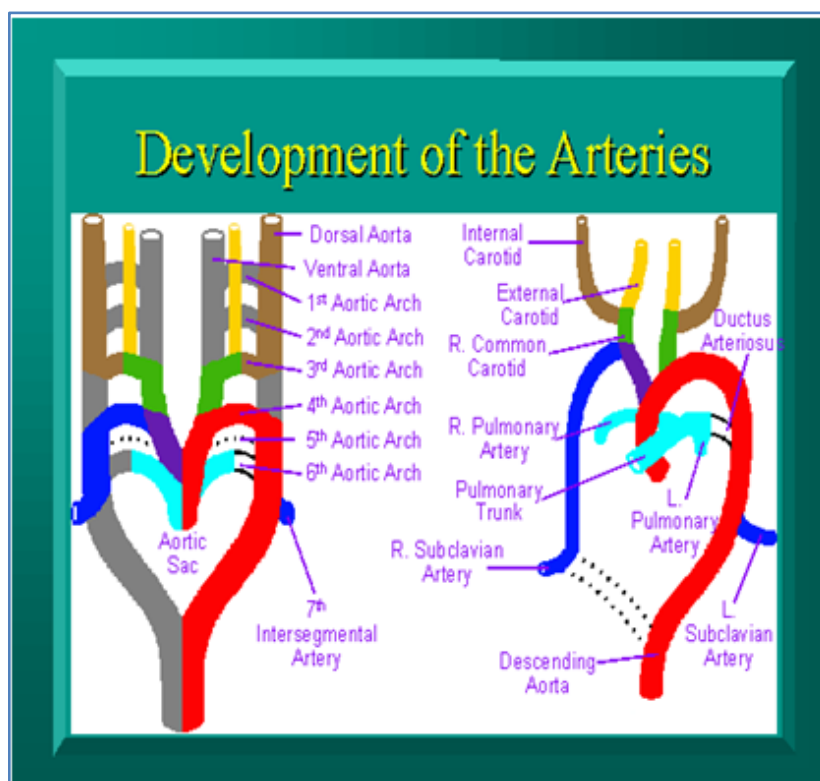


Fig. 4

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AUTHORS:

1. Pushpalatha M.
2. Chitra N.

PARTICULARS OF CONTRIBUTORS:

1. Professor, Department of Anatomy, Bangalore Medical College & Research Institute.
2. Post Graduate, Department of Anatomy, Bangalore Medical College & Research Institute.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Pushpalatha M,
Professor, Department of Anatomy,
Bangalore Medical College & Research Institute.
E-mail: sathyaspus@yahoo.com

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