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Original Research Article

A CADAVERIC STUDY ON LATERAL THORACIC ARTERY

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ABSTRACT

Introduction: Lateral thoracic artery is one of the branches of second part of axillary artery which arises near the lateral border of pectoralis minor.

Aim and Objectives: To study the variations in the origin of Lateral thoracic artery and note its pattern.

Materials and methods: 54 axillae from embalmed cadavers allotted for dissection were used for the study. There were 22 male and 5 female cadavers, with ages ranging from 60 to 80 years, specimens of both sides were used.

Results: The commonest variation was common trunk for Lateral thoracic artery and Thoracodorsal Artery (9.5%).

Conclusion: The study was carried out to show important variations in the branching pattern of lateral thoracic artery, in order to orient the surgeons performing reconstructive plastic surgery and modified radial mastectomy.

KEY WORDS: Lateral thoracic artery, Axillary artery, Subscapular artery, Thoracodorsal artery.

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INTRODUCTION

The lateral thoracic artery arises from the second part of the axillary artery. Following the lateral border of pectoralis minor, it passes to the deep surface of pectoralis major as far distally as the fifth intercostal space. It supplies serratus anterior and the pectoral muscles, the axillary lymph nodes and subscapularis. It anastomoses with the internal thoracic,b subscapular, and intercostal arteries and with the pectoral branch of the thoraco-acromial artery. In females it is large and has lateral mammary branches, which curve round the lateral border of pectoralis major to the breast. In both males and females, it gives off cutaneous branches which pass around the lateral border of pectoralis major to supply the skin in this region [1].

Many variations of lateral thoracic artery which have been documented by other authors are as follows:

1. Origin of lateral thoracic artery from sub-scapular artery.

2. Origin of lateral thoracic artery from either 1st or 2nd part of axillary artery.

3. Origin of lateral thoracic in common with thoracodorsal artery [2].

Proximal part of the main trunk of axis artery of upper limb forms the axillary and

brachial arteries and its distal part, the anterior interosseous artery. Variations in branching pattern of axillary artery are due to defects in embryonic development of the vascular plexus of upper limb bud. This may be due to an arrest at any stage of development of vessels followed by regression, retention or reappearance, thus leading to variations in the arterial origin and course of major upper limb vessels [3,4].

Variations of lateral thoracic artery is useful during procedures of lateral aspects of the thorax such as reconstructive plastic surgery and modified radial mastectomy [5].

MATERIALS AND METHODS

54 axillae from embalmed cadavers allotted for dissection in the Department of Anatomy for a duration of 3 years were used for the study. There were 22 male and 5 female cadavers, with ages ranging from 60 to 80 years.

The axillary region was dissected and exposed according to the methods described in Cunningham's Manual of Practical Anatomy. The arterial pattern and variations of PCHA were noted down [6].

Photograph of each specimen was taken after dissection, with digital camera and labelled.

OBSERVATIONS AND RESULTS

Table 1: Arterial pattern of lateral thoracic artery.

Arterial pattern	Male				Female			
	Left (n=22)		Right (n=22)		Left (n=5)		Right (n=5)	
	No.	%	No.	%	No.	%	No.	%
II part of AA	19	86.3	18	81.8	5	100	2	40
LTA + TDA	2	9.2	1	4.5	-	-	2	40
LTA + SSA	1	4.5	2	9.2	-	-	1	20
Double LTA	-	-	1	4.5	-	-	-	-

The classical arterial pattern was observed in 44 (81.5%) specimens and 10 (18.5%) specimens were variant. Common trunk for LTA & TDA was observed in 5 (9.5%) specimens and common trunk for LTA & SSA was observed in 4 (7.2%). In one specimen (1.8%) we noted double LTA, one from common trunk for LTA and SSA and another arising from SSA. (Specimen no. 3)

Fig. 1: Showing common trunk (CT) for Lateral thoracic artery (LTA) and Thoracodorsal artery (TDA).

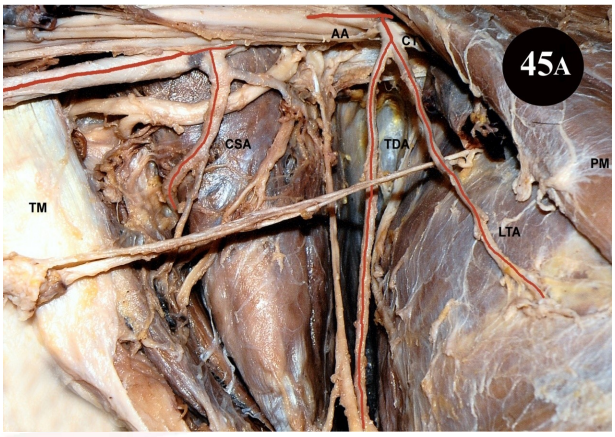


Fig. 2: Showing common trunk (CT) for Lateral thoracic artery (LTA) and Subscapular artery (SSA).

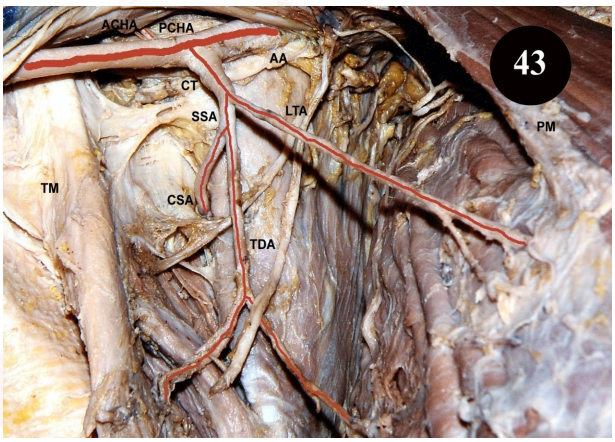
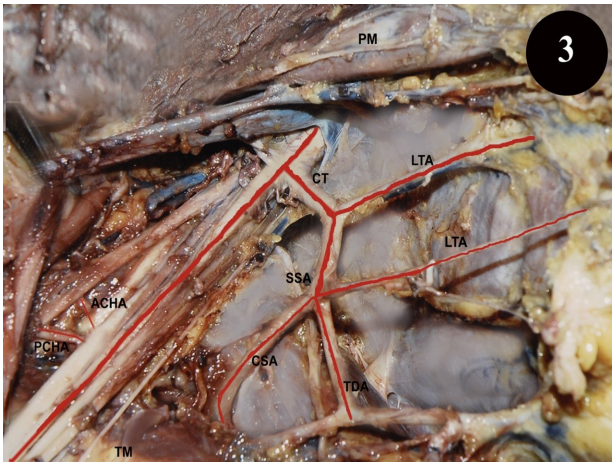


Fig. 3: Showing double Lateral thoracic artery, common trunk (CT) for Lateral thoracic artery (LTA) and Subscapular artery (SSA), second LTA arising from SSA.



DISCUSSION

Based on observations made by Trotter M and co-authors (1930), on dissections of 384 arms reported that the lateral thoracic arose from subscapular in 24, whereas in our study it was

seen in 4 specimens [7].

Table 2: Comparison of sites of origin of **LTA [8].**

Sl. No.	Name of Author	Site of origin in (%)	
		Directly from II part of AA	In common with SSA
1	Pellegerini et al [14]	70.2	7.7
2	Adachi et al [14]	40	-
3	DeGaris et al [14]	55.9	1.2
4	Trotter et al [7]	69.6	-
5	Tan CBC et al [2]	71.4	-
6	Huelke Df [10]	52.2	14
7	Patnaik VVG et al [8]	82	6
8	Present study	81.5	7.2

The above table signifies that LTA was a constant direct branch from second part of axillary artery with percentage ranging from 40 to 82, findings in our study was within the same range with 81.5 %. The variant variety with SSA ranged between 1.2 % to 14%, in our study it was 7.2 %.

In a study conducted by Ming-Tzu P (1940) on 70 axillae of Chinese population made observations based on mode of origin of the branches of the axillary artery and various types were classified according to the different arrangements of its branches. Of the 20 types, Subscapular Artery with lateral thoracic artery was seen in 11.4%,whereas in our study it was 7.2 % [9].

In a study conducted by Huelke DF (1959) in 89 adult cadavers reported that, the lateral thoracic artery when variant was more often a branch of the subscapular or thoracodorsal artery similar to the variant patterns in our study [10].

Olinger A and Benninger B in their study conducted on 166 axillae found that LTA arose with TDA in 7.2 %, in our study we observed a little higher incidence of 9.5% [11].

Astik R and Dave U, in their study found lateral thoracic artery arising from subscapular artery in 16 out of 80 upperlimbs (20%) which was higher compared to our study(7.2%) [12].

Magden O (2007) reported a case in which the lateral thoracic and thoracodorsal arteries arose together from the third part of the axillary artery as “a lateral thoracic – thoracodorsal” common trunk, similar pattern was observed in 5 specimens in our study [13].

Loukas M et al. observed that multiple LTAs were present in 3.09% (26 out of 420 specimens) whereas in our study we found in 1.8%(1 out of 54 specimens) [5].

According to Bergman RA, lateral thoracic artery may arise from the thoracoacromial in 12% as compared to 9.2% in our study. In about 24% of cases it is doubled (Poynter), in comparision to1.8% in our study [14].

CONCLUSION

Most common variation noted in present study was common trunk for lateral thoracic artery and thoracodorsal artery. Variations of lateral thoracic artery is useful during procedures of lateral aspects of the thorax such as reconstructive plastic surgery and modified radial mastectomy.

ABBREVIATIONS

AA - Axillary artery

CT - Common trunk

LTA - Lateral thoracic artery

PM - Pectoralis minor

SSA - Subscapular artery

TDA - Thoracodorsal artery

Conflicts of Interests: None

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