

Bilateral alar thoracic artery

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During a routine dissection a superficial artery was observed coursing subcutaneously at the anterior border of the axillary base towards the thoracic wall and bilaterally at the lower border of the pectoralis major muscle. On the right side it originated from the 3rd part of the axillary artery but on the opposite side the origin was from the first centimetre of a left radial artery originating directly from the axillary artery together with the left brachial artery. Apart from the bilateral absence of the deep brachial artery, no other anomalies were identified at this level. This variant corresponds to the alar thoracic artery, an unusual and rarely reported artery. The literature on the subject contains no reference either to the bilateral evidence for the alar thoracic artery or to the possibility of an origin from a high radial artery. The presence of such an alar thoracic artery may interfere with surgical access within the axillary fossa and should be taken into consideration.

Key words: bilateral alar thoracic artery, axillary artery, radial artery

INTRODUCTION

To explain the existence of arterial variations in the upper limb of the adult several hypotheses have been advanced on the basis of findings from adult corpses, taking into account that these variations represent a transitory embryonic stage. However, few embryological studies exist, probably as a result of the difficulty involved in obtaining human embryonic material [5]. The variations arise through the persistence, enlargement and differentiation of parts of the initial network, which would normally remain as capillaries or even regress [4].

Although there are numerous references to the main axillary artery variants, they are scant with regard to the alar thoracic artery. Mentions of this variant are similar except for a few details and, in general, there is a lack of evidence for them:

- an unusual branch of the axillary artery to the lymph nodes and skin of the axilla [1];
- origin in the 2nd part of the axillary artery, perhaps supplying fat and lymph nodes in the axilla [6];

— a variable branch arising from the 3rd part of the axillary artery and supplying the fascia and lymph nodes of the axilla [3].

A rare case of a thoraco-epigastric artery was reported [2]. This artery passes as a common trunk between the roots of the median nerve and divides into a lateral muscular trunk and a medial branch, which descends on the anterior aspect of the axillary fossa, reaching the hypogastric region and anastomosing with the superficial epigastric artery.

MATERIAL AND METHODS

Dissections of the axillae and upper limbs were performed bilaterally in the formalin-fixed corpse of an adult male aged 52 years. After axillary base skin removal a subcutaneous artery was found, coursing towards the lower border of the pectoralis major muscle. Further dissection provided evidence of the anatomical parameters of this artery and its bilateral presence.

RESULTS

On the right side a small calibre artery left the medial side of the 3rd part of the axillary artery (Fig.1, 2). It first descended towards the antero-inferior border of the axillary fossa and then pierced the fascia to become subcutaneous and continue towards the lower border of the pectoralis major muscle. On reaching the thoracic wall it dissipated as small branches in the superficial layers. The first segment of this artery, the descending segment, is deeply located within the axilla. It passed between the roots of the median nerve and then crossed the medial antebrachial cutaneous nerve anteriorly where both these elements traverse the duplicated end portion of the medial brachial vein (Fig. 3). The superficial segment of the artery is subcutaneous, between the axillary base skin and the axillary fascia, directly crossed anteriorly by the intercostobrachial nerve branches (Fig. 1, 2). On this side the lateral thoracic artery corresponds to the conventional descriptions, including the branches for the axillary lymph nodes [6]. Leaving this 3rd part of the axillary artery are also the circumflex humeral arteries within the normal parameters.

On the left side a corresponding artery was found, coursing subcutaneously in the axillary base (Fig. 4). This did not leave the axillary artery but, instead, left the segment of origin of an artery coursing in the arm with no branches and continuing in the forearm satellite to the brachioradialis muscle, a radial artery originating directly from the axillary artery together with the brachial artery (Fig. 4, 5). As a result of its origin distally to the lower border of the teres major muscle, it adopts a first segment recurrent towards the base of the axilla, crossing over the brachial vein (Fig. 6). The following segment is, as on the opposite side, subcutaneous, with the same parameters. Similarity is demonstrated to the course and distribution of the lateral thoracic and the circumflex humeral arteries.

DISCUSSION

The few available descriptions of the alar thoracic artery present it as a branch of the 2nd part of the axillary artery [6] or of the 3rd part of the axillary artery [3] or refer only to the origin from the axillary artery. The distribution is also regularly mentioned, not only to the axillary lymph nodes, but also to the fascia [3] or skin [1]. A case of a so-called "thoraco-

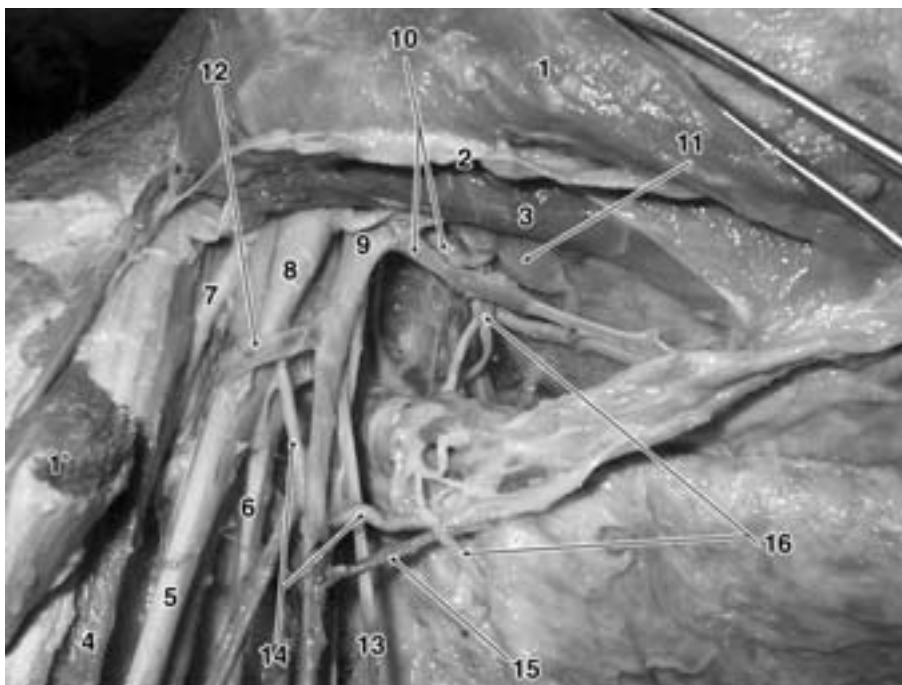


Figure 1. The right alar thoracic artery coursing over the axillary fascia. 1 — pectoralis major m.; 2 — clavipectoral fascia; 3 — pectoralis minor m.; 4 — coracobrachialis m.; 5 — median n.; 6 — ulnar n.; 7 — musculocutaneous m.; 8 — axillary a.; 9 — axillary v.; 10 — lateral thoracic vessels; 11 — pectoral lymph nodes; 12 — end part of the lateral brachial v.; 13 — medial antebrachial cutaneous n.; 14 — alar thoracic a.; 15 — alar thoracic v.; 16 — intercostobrachial nn.

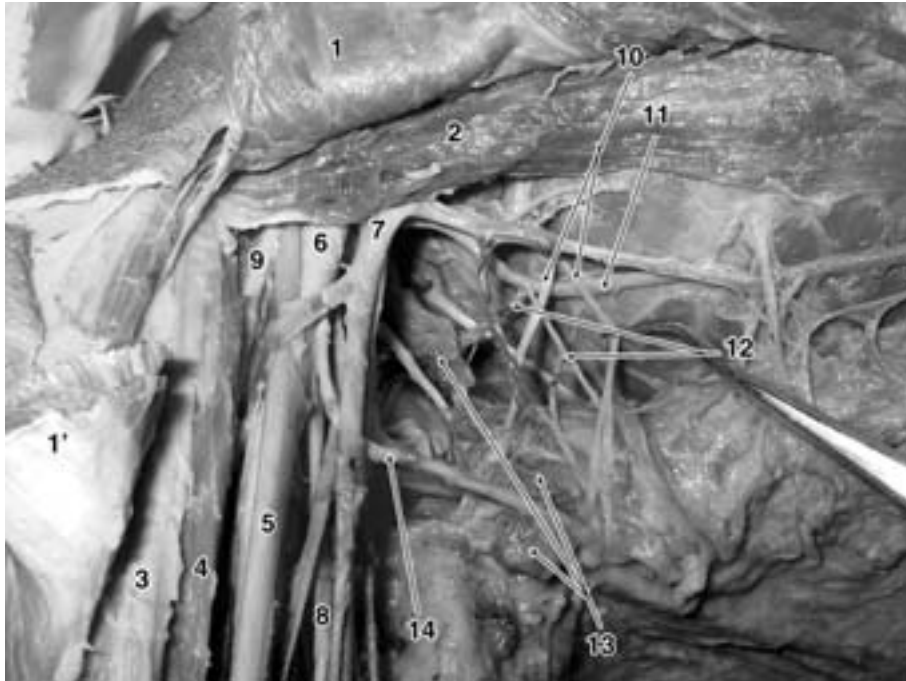


Figure 2. The right alar thoracic artery; the lateral thoracic artery on this side also distributes to the axillary lymph nodes. 1 — 1', pectoralis major m. (divided, reflected); 2 — pectoralis minor m.; 3 — short head of biceps brachii m.; 4 — coracobrachialis m.; 5 — median n.; 6 — axillary a.; 7 — axillary v.; 8 — ulnar n.; 9 — musculocutaneous n.; 10 — intercostobrachial nn.; 11 — lateral thoracic a.; 12 — lymphonodal branches of the lateral thoracic a.; 13 — axillary lymph nodes; 14 — alar thoracic a.

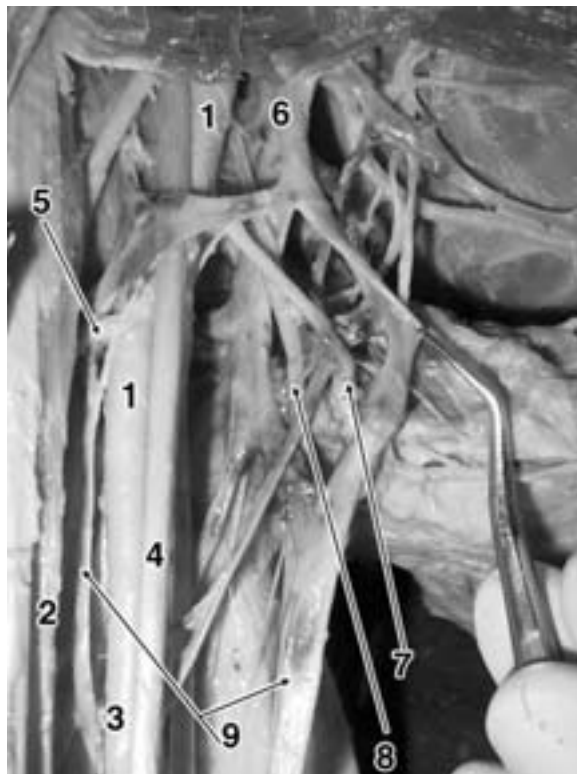


Figure 3. Complex arteriovenous relations of the right alar thoracic artery. 1 — axillary a.; 2 — coracobrachialis m.; 3 — brachial a.; 4 — median n.; 5 — anterior circumflex humeral a. traverses a venous duplication; 6 — axillary v. results from the brachial veins, of which the lateral is thinner and the thicker medial appears duplicated in the terminal part; 7 — alar thoracic a.; 8 — medial antebrachial cutaneous n.; 9 — brachial vv.

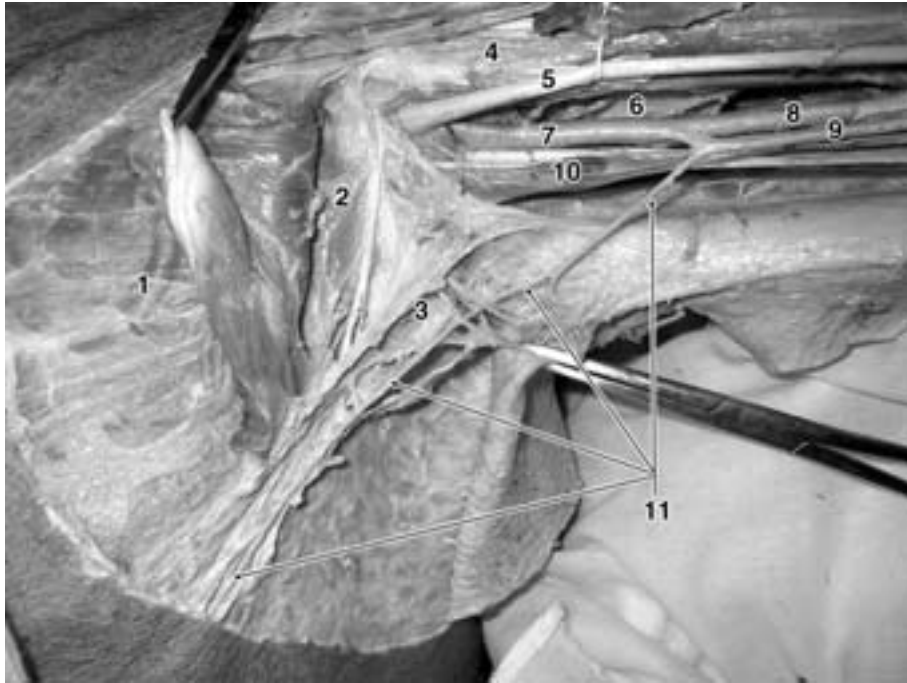


Figure 4. The left alar thoracic artery originates from the initial segment of a high originated radial artery (anatomical variant from another anatomical variant). 1 — pectoralis major m.; 2 — pectoralis minor m.; 3 — axillary fascia; 4 — short head of biceps brachii m.; 5 — median n.; 6 — latissimus dorsi tendon; 7 — axillary a.; 8 — brachial a.; 9 — radial a. (anatomical variant); 10 — axillary v.; 11 — alar thoracic a.

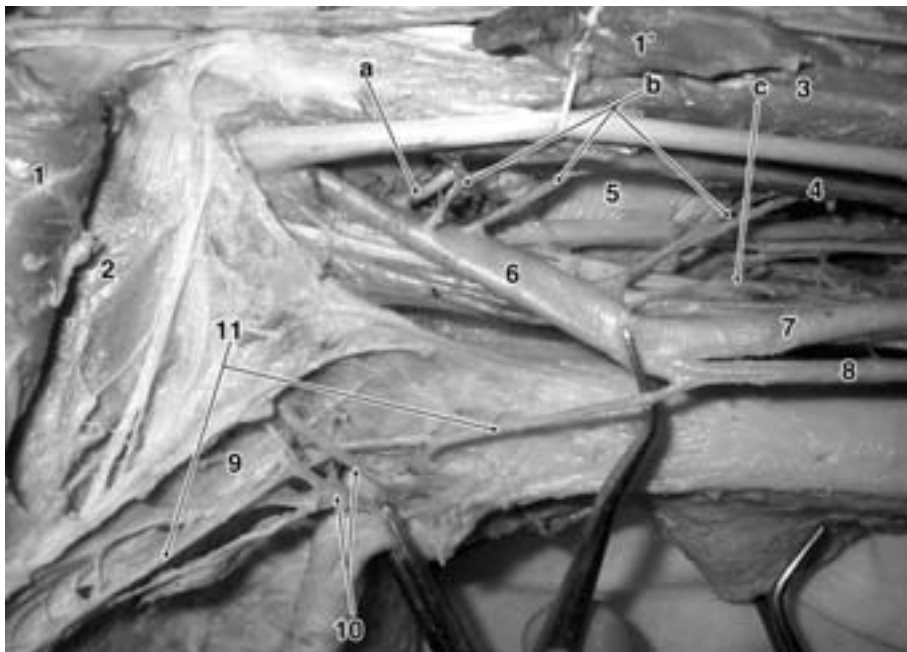


Figure 5. The left alar thoracic artery; arterial pattern of the 3rd part of the axillary artery. 1 — 1', pectoralis major m. (divided, reflected); 2 — pectoralis minor m.; 3 — short head of biceps brachii m.; 4 — coracobrachialis m.; 5 — latissimus dorsi tendon; 6 — axillary a. (a — anterior circumflex humeral a.; b — muscular branches, c — superior collateral ulnar a.); 7 — brachial a.; 8 — radial a. (anatomical variant); 9 — axillary fascia; 10 — intercostobrachial nn.; 11 — alar thoracic a.

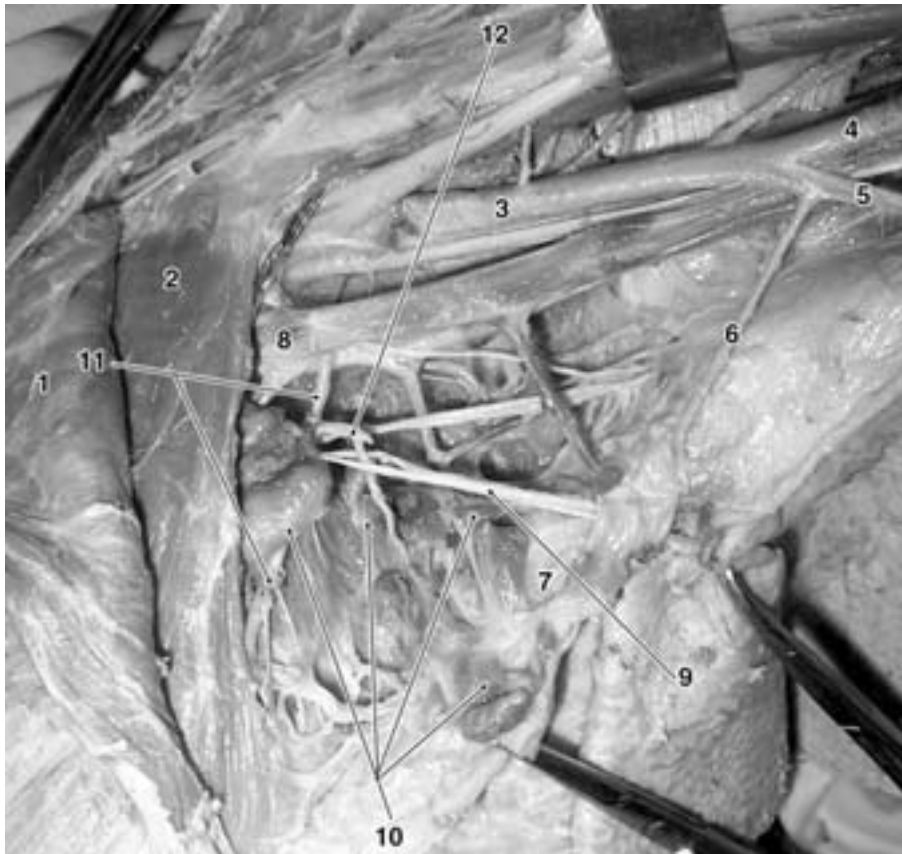


Figure 6. The left alar thoracic artery; the lateral thoracic artery also supplies the lymph nodes. 1 — pectoralis major m.; 2 — pectoralis minor m.; 3 — axillary a.; 4 — brachial a.; 5 — radial a. (anatomical variant); 6 — alar thoracic a.; 7 — axillary fascia; 8 — axillary v.; 9 — intercostobrachial n.; 10 — axillary lymph nodes; 11 — lateral thoracic a.; 12 — lymphonodal branches.

-epigastric artery" is reported as passing between the median nerve roots and giving a muscular trunk and a superficial branch towards the superficial epigastric artery [2]. Apart from the terminology and individual characteristics, all of these correspond to the portrait of the alar thoracic artery as superficial and distributed to the investing layers of the base of the axilla and the axillary lymph nodes. The thoraco-epigastric artery can also be considered as a much longer alar thoracic artery provided with additional muscular branches.

In conclusion, the superficial arteries reported here can be regarded as alar thoracic arteries, both supplied for lymph node distribution by the lateral thoracic arteries.

These alar thoracic arteries come with several peculiarities:

- bilateral evidence;
- differences in origin (bilateral asymmetry): from the 3rd part of the axillary artery and from the

initial segment of a radial artery, which in turn originates with the brachial artery as terminal branches of the axillary artery;

- the fact that the alar thoracic artery with higher origin (axilla) first presents a deeply descending segment followed by a subcutaneous one;
- the fact that the alar thoracic artery with lower origin (proximal arm) first presents an ascending segment in the proximo-medial arm followed by the subcutaneous segment.

This report of an unusual branch of the axillary artery provides evidence and complements the few existing data on this variant. It may be of practical interest when surgical access to the axilla is performed.

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In common with all my work, this paper is dedicated to my wife and my son. Special appreciation is due to Roxana Victoria Ivaşcu for helping me in the dissection of this anatomical variant.

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