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ANOMALOUS ORIGIN OF THE LATERAL THORACIC ARTERY: CASE REPORT

ORIGEM ANÔMALA DA ARTÉRIA TORÁCICA LATERAL: RELATO DE CASO

ORIGEN ANÓMALO DE LA ARTERIA TORÁCICA LATERAL: INFORME DE UN CASO

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ABSTRACT

The arterial supply of the lateral wall of the chest is provided by branches of the axillary artery (AA), which is subdivided into three parts by the pectoralis minor muscle. Regarding the anatomical variation in the branches originating from the artery, axillary, when if treats from the artery thoracic side emerging as a branch of the subscapular artery has an incidence rate of approximately 3.9% (Loukas et al. , 2013). In this way, the subscapular artery generates its terminal branches described in the literature and also gives off the lateral thoracic artery, forming a trifurcation. Thus, this article aims to report an anatomical variation in the origin of the lateral thoracic artery of one individual of sex masculine, with focus in the explanation anatomical of the findings. Variations in the axillary artery and its branches are common and many of which they are documented in the literature, being this found described in the literature with an incidence of 3.9% (Gravante, 2012), this finding being important in treatment prior the procedures invasive from the region axillary.

Keywords: Subscapular Artery. Lateral Thoracic Artery. Variation Anatomical.

RESUMO

O suprimento arterial da parede lateral do tórax é fornecido por ramos da artéria axilar (AA), que é subdividida em três partes pelo músculo peitoral menor. Em relação à variação anatômica nos ramos originários da artéria, a axilar, quando se trata da artéria torácica lateral emergindo como ramo da artéria subescapular tem uma taxa de incidência de aproximadamente 3,9% (Loukas et al., 2013). Desta forma, a artéria subescapular gera seus ramos terminais descritos na literatura e também emite a artéria torácica lateral, formando uma trifurcação. Assim, este artigo tem como objetivo relatar uma variação anatômica na origem da artéria torácica lateral de um indivíduo do sexo masculino, com foco na explicação anatômica dos achados. Variações na artéria axilar e seus ramos são comuns e muitas delas estão documentadas na literatura, sendo esta descrita na literatura com uma incidência de 3,9% (Gravante, 2012), sendo este achado importante no tratamento prévio a procedimentos invasivos da região axilar.

Palavras-chave: Subscapular Artery. Lateral Thoracic Artery. Anatomical Variation.

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RESUMEN
El suministro arterial de la pared lateral del tórax proviene de ramas de la arteria axilar (AA), la cual se subdivide en tres porciones por el músculo pectoral menor. Respecto a la variación anatómica en las ramas que se originan de la arteria axilar, cuando se trata de la arteria torácica lateral que emerge como una rama de la arteria subescapular, tiene una tasa de incidencia de aproximadamente el 3,9% (Loukas et al., 2013). De esta manera, la arteria subescapular genera sus ramas terminales descritas en la literatura y también da origen a la arteria torácica lateral, formando una trifurcación. Por lo tanto, este artículo tiene como objetivo reportar una variación anatómica en el origen de la arteria torácica lateral de un individuo de sexo masculino, con enfoque en la explicación anatómica de los hallazgos. Las variaciones en la arteria axilar y sus ramas son comunes y muchas de ellas se encuentran documentadas en la literatura, encontrándose ésta descrita en la literatura con una incidencia del 3,9% (Gravante, 2012), siendo este hallazgo importante en el tratamiento previo a procedimientos invasivos de la región axilar.

Palabras clave: Arteria Subescapular. Arteria Torácica Lateral. Variación Anatómica.

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1 INTRODUCTION

The axillary artery is a continuation of the subclavian artery and is divided into three parts by the pectoralis minor muscle. The first part, superior to the muscle, gives off a branch, the superior thoracic artery. The second part, behind the muscle , from the origin the two arteries, the to know, arteries thoracoacromial and lateral thoracic . Three arteries arise from the third part (inferior to the pectoralis minor), namely the subscapular, anterior circumflex humerus, and posterior circumflex humerus. Node however, several authors reported standards of branch different from those normally seen. Nearly 62.5% of the population may have a varied axillary artery pattern, which means that care must be taken when dealing with this artery (Astik, 2012).

A priori, the arterial supply of the lateral wall of the chest is carried out by branches from the artery axillary (AA), artery this what and subdivided in 3 parts by the muscle pectoral minor. THE first part refers to from the edge side from the first rib until the edge medial of muscle pectoral minor, while the second part and later and the third part side the this muscle. THE AA it presents as standard typical of branch the artery thoracic superior in the first part; thoracoacromial and lateral thoracic arteries in the second part and the subscapular, anterior circumflex and posterior humeral arteries in the third part (Goldman, 2012). Thus, this AA in total has 6 branches: superior thoracic artery , thoracoacromial, artery thoracic side (ATL), artery subscapularis (AS), arteries circumflex previous and later of humerus (ACPU) (Moore and al. , 2021).

Among these, the subscapular artery, in short originating from the third part of the AA, is the branch with the largest diameter and shortest length, presenting a final bifurcation into the circumflex artery of the scapula, a component of the anastomoses of the posterior region of the scapula, and into the thoracodorsal artery, responsible for supply the muscle latissimus of back. Furthermore, the standard classic of 6 branches with origins distinct in the AA described in the literature classic this present in only 27% of the population (Xhankaza, 1959).

However, the ATL is a branch of the second part of the axillary artery, accompanying the lateral border of the pectoralis minor muscle, directing itself towards the deep surface of muscle pectoral bigger, and he has put purpose to supply arterial supply to the breasts, through the lateral mammary branches, and to other muscles from the region (Birch et al. , 2016).

Second Huelke (1959), the incidence from the origin of two branches in a trunk common and bigger of what the standard expected, overcoming in 10% the described in the

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literature. Still regarding the variations in the original arrangement, it is necessary to note that the emergence in stem common from the TO THE and from the ATL it presents one incidence of 28.6%, approximately.

Still regarding the anatomical variation in the branches originating from the AA, when it comes to the lateral thoracic artery arising as a branch of the subscapular artery there is one rate of incidence of approximately 3.9% (Loukas et al. , 2013). In this way, the subscapular artery generates its terminal branches described for the literature (artery thoracodorsal and artery circumflex from the scapula) and presents the origin from the artery thoracic side, performing one trifurcation. By consequently, the knowledge about of these variations and mister in surgical interventions that use the armpit region as a field of action, such as put example one mastectomy in consequence of neoplasm, corroborating for the basis wide of foundation surgical- anatomical. Thus, this article aims to report an anatomical variation of origin from the artery thoracic side.

2 REPORT OF CASE

He was dissected one corpse of sex masculine, with age estimated of 50 years old, belonging to the Anatomy Laboratory of the School of Health Sciences. The cadaver in question, after the standard conservation process in formaldehyde 10%, it happened put process of dissection.

Node chest he was withdrawn the railing costal and clavicle to the visualization of the viscera and structures vascular, specifically to the arteries subclavian, axillary and their respective branches. To visualize the anatomical variation of the subscapular artery, the connective tissue surrounding the vessel was dissected and divulsed, revealing the origin, course, and anomalous branching of the structure. It can then be seen that the lateral thoracic artery, usually described as a branch of the second portion from the artery axillary, if originates as one branch extra from the subscapular artery, together the thoracodorsal and circumflex from the scapula (Figure 1).

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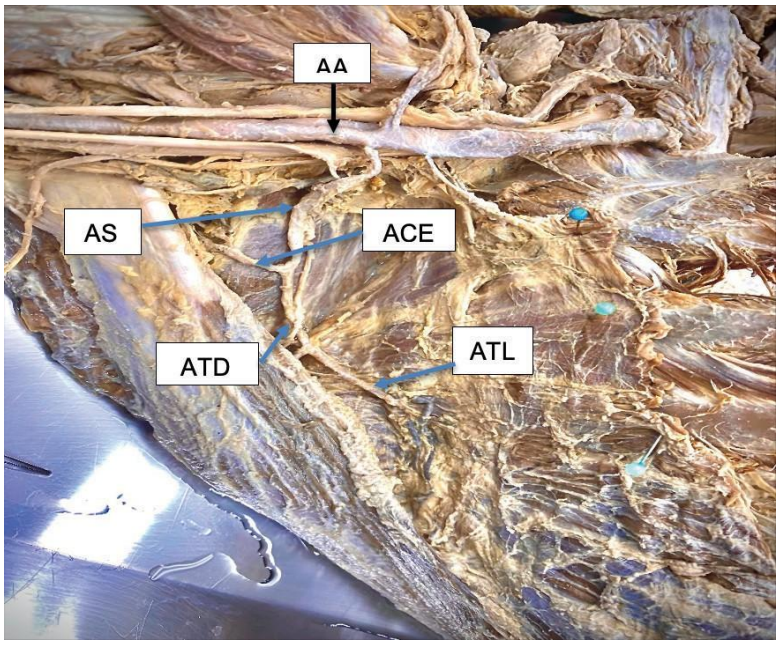
Figure 1

Artery axillary right, second part



Legend: AA-axillary artery; AS- subscapular artery; ACE- circumflex artery of the scapula; ATD- thoracodorsal artery; ATL- lateral thoracic artery.
Source: Laboratory of Anatomy-UEA (2025).

3 DISCUSSION

The lateral thoracic artery often arises from the second part of the axillary artery, running to the lateral border of the pectoralis minor and then along the deep surface of the pectoralis major, supplying the axillary lymph nodes, serratus anterior muscle, pectoralis muscles, and subscapularis muscle. In women, it also serves as an important blood supply to the breast and typically anastomoses with branches of the internal thoracic artery (Dobrut, 2013). It has also been reported that it may branch from the first and third parts of the axillary artery alone or as a common trunk with one or more of the others (Daimi, 2010). The most commonly mentioned variations regarding its origin are from the thoracoacromial artery (or trunk, as it is commonly referred to in the surgical literature) or the subscapular artery.

In our study, it was found that in the right axillary region the lateral thoracic artery was emitted by the subscapular artery. This variation appears to be the least consistently reported in terms of occurrence, however, it is a quite common branching pattern, between 8-10%, as observed in the studies by Bergman et al. (1988) and Standring et al. (2005). This fact is consistent with Brilakis et al. (2023) when stating that it is common for the ATL to arise from the AS or one of its terminal branches. Furthermore, the variability of the AA is greater in the third part followed by the second, with the first part being highly constant (Brilakis et al. ,

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2023). Thus, the AS that generally arises in the third part of the AA at the lower border of the subscapularis muscle, in addition to being the largest branch of the AA, is also the most variable (Standring, 2013).

The development of the limb arterial system is a dynamic process involving the formation, remodeling, and progressive differentiation of blood vessels. During embryogenesis, primitive vascular structures, initially in the form of capillaries, undergo selective dilation, allowing them to transform into larger vessels. This process occurs in parallel with the maturation of the vascular wall, with the development of the smooth muscle layer and the organization of the three tunics, providing sufficient strength to withstand high blood pressures and ensure adequate tissue supply (CHEN, 2021).

The choice of certain vessels to become functional arteries results from the combined action of molecular factors, such as vascular endothelial growth factor (VEGF), Notch signaling and hemodynamic stimuli resulting from blood flow, which help to consolidate the integrity of the arterial structure after the establishment of circulation (ROUX, 2020).

Thus, the anatomical variations observed, as in the case of the lateral thoracic artery (LTA), reflect the complexity of the mechanisms of persistence and regression of primitive vessels, modulated by genetic and environmental factors and signaling pathways that act during embryonic development (CHEN, 2021).

According to the study of the irrigation pattern carried out by Loukas et al. (2014) with 420 cadavers, the ATL in 6 types according to its origin: type I when the ATL comes from the thoracoacromial artery (67.62% of the specimens), type II from the AA (17.02%), type III from the ATD (5%), type IV from the AS (3.93%), type V by multiple ATL (3.09%) and type VI when the ATL is absent (3.33%), and in this study we found the type IV variation. That is, there is the type IV ATL variation pattern when branches of the lateral thoracic artery emerge from the subscapular artery and both the circumflex artery of the scapula and the thoracodorsal artery follow normal branching patterns.

In the study carried out by Xhakazal (2013) with 100 axillary axillary specimens obtained during anatomical dissections of 12 female and 38 male adult South African cadavers, the AS was present in 89% of cases. Of these 89%, the AS originated directly from the second part of the AA in 52.8% (47/89), in 16.9% (15/89) the AS was bilateral and in 47.2% (42/89) the AS emerged directly from the third part of the AA, and there were no statistically significant differences regarding the sex analyzed (Xhakazal, 2013).

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Knowledge of the anatomical variations of the lateral thoracic artery (LTA) is essential in different surgical contexts, including breast procedures, axillary lymph node dissections, sentinel lymph node biopsies, chest wall reconstructions, trauma surgeries, and interventions involving the axillary sheath. Therefore, meticulous dissection, preservation of the arteries supplying the breast and chest wall, and recognition of these variants are essential to reduce complications, optimize flap utilization, and improve surgical outcomes. In this context, preoperative imaging tests, such as computed tomography with three-dimensional reconstructions, are valuable tools for anticipating the variable anatomy of ATL.

4 CONCLUSION

Knowledge of the variation of the axillary artery and its branches is useful in determining pathology, appropriate treatment, and appropriate surgical procedures. THE origin from the ATL and of interest to numerous procedures, including reconstructive surgeries involving head and neck cancer using the ATL-supplied pectoralis major flap, radical mastectomy, reconstruction mammary and reduction mammary, what in the majority of the cases require that the ATL remain untouched. It is worth highlighting the contribution to the expansion of knowledge and from the practice professional oriented, good as to demonstrate the constant need of new research node field of variations anatomical.

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