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CASE REPORT

Axillary arch as a rare variant of the latissimus dorsi: cadaveric case report and literature review

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ABSTRACT

This case report explores the axillary arch, a rare anatomical variation of the latissimus dorsi muscle, which can compress vital neurovascular structures in the axilla. We present a detailed examination of a 75-year-old male cadaver, where the axillary arch was identified extending from the latissimus dorsi to the pectoralis major. The arch measured 6.0 cm in length and 0.6 cm in width, passing over the intercostobrachial nerve, median nerve, and medial brachial vein. The potential for this anatomical variant to cause neurovascular compression and contribute to conditions such as thoracic outlet syndrome is discussed. This study emphasizes the importance of recognizing the axillary arch in surgical practice to avoid complications during procedures involving the axillary region. Insights gained from cadaveric dissections are vital for enhancing our understanding of anatomical variations and their clinical implications.

Keywords: axillary arch, neurovascular compression, surgical anatomy, anatomical variation, cadaveric study

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INTRODUCTION

The axilla is a clinically significant region due to the presence of vital neurovascular structures and a variety of anatomical variations. One such variation is the axillary arch (AA), an anomaly of the latissimus dorsi muscle. This muscular slip typically extends from the anterior edge of the latissimus dorsi and crosses the axillary neurovascular bundle. Its insertion varies and may include the pectoralis major, coracoid process, biceps brachii, or brachial fascia.

The AA has been linked to potential neurovascular entrapment, especially in clinical or surgical settings. Cadaveric studies remain essential for identifying such variants. This paper presents a rare case in which the AA was observed to lie in close proximity to both the intercostobrachial and median nerves, as well as the brachial vein. Clinical implications of this variation are discussed, along with a literature review.

CASE PRESENTATION

During a dissection course at the Anatomy Laboratory of the Medical School, Aristotle University of Thessaloniki, we examined a 75-year-old male cadaver with no available medical history or known cause of death. The cadaver had been embalmed using a formalin-based technique. Dissection of the axillary region revealed an abnormal muscular structure.

The AA originated from the lateral border of the thoracic part of the latissimus dorsi muscle, had an oblique course from the medial inferior to lateral superior and inserted into the inferior deep surface of the pectoralis major muscle next to its insertion to the humeral bone. It was measured in cm, using a digital sliding caliper (Mitutoyo ABSOLUTE 500-196-20 model; Mitutoyo Corporation, Kanagawa, Japan), which had a recording of 6.0 cm in length and 0.6 cm in width. The landmarks that were used for the exact measurement of the Axillary Arch are

for the width we took the visible borders of the AA; however, for the length we took the origin of the arch on the upper third of the lateral border of the latissimus dorsi to the point where the arch inserted on the deep inferior surface of the pectoralis major, at its insertion to the bicipital groove The AA coursed obliquely over the axillary contents, traversing anterior to the intercostobrachial nerve (ICBN), the median nerve (MN), and the medial brachial vein (MBV) (Figure 1).

DISCUSSION

The axillary region contains vital neurovascular elements and demonstrates a range of muscular variations with potential clinical relevance. Among the most frequently encountered variations is the axillary arch (AA), also known as Langer's arch. This muscular, tendinous, or fascial slip typically originates from the anterior border of the latissimus dorsi and traverses the axillary fossa to insert into the pectoralis major, coracobrachialis fascia, or brachial fascia [1,2].

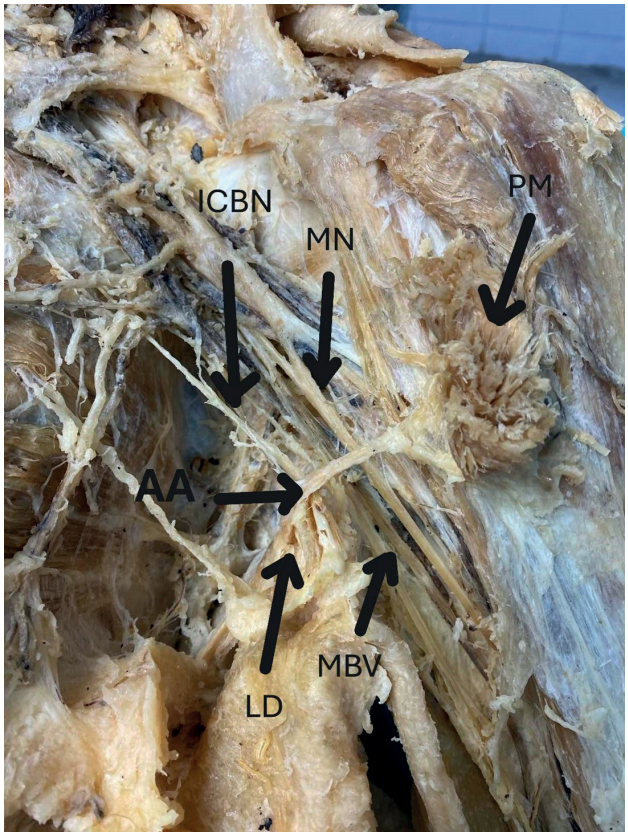

Figure 1. The AA originating from the latissimus dorsi (LD) and inserting into the pectoralis major (PM), lying superficial to ICBN, MN, and MBV. Bold arrows indicating the mentioned vessels, nerves, and muscles.

The AA may be complete or incomplete depending on its insertion pattern and may cross superficial or deep to the neurovascular bundle [3]. In our case, the AA coursed obliquely over the axillary contents, lying anterior to the intercostobrachial nerve, median nerve, and brachial vein. While no compression was documented, this anatomical configuration raises the possibility of dynamic impingement during arm movement [4].

Although frequently asymptomatic, the AA has been associated with thoracic outlet syndrome, venous stasis, lymphedema, and median or ulnar nerve entrapment in select clinical scenarios [5,6]. Some symptoms—such as axillary edema, venous dilation, or positional paresthesia—have been reported in relation to the AA, though establishing causality remains challenging in the absence of imaging or electrophysiological data [7].

The prevalence of the AA varies widely in the literature, ranging from 0.25% to 27% in cadaveric studies [8,9], and up to 43.8% in some imaging series [10]. The majority of cases are unilateral, with inconsistent data regarding lateralization. While Bertone et al. [11] reported a left-sided predominance, others found a higher frequency on the right [4]. Gender does not appear to influence prevalence significantly [9].

The AA's morphology is variable, with reported lengths ranging from 7–12.5 cm and widths of 0.6–1.5 cm [1,12]. In our case, the arch measured approximately 6.0 cm in length and 0.6 cm in width, inserting into the deep surface of the pectoralis major. Based on MRI studies, the AA may be visualized in coronal, axial, or sagittal planes, potentially mimicking masses during imaging or surgical procedures [13].

The arch may receive innervation from the thoracodorsal, medial, or lateral pectoral nerves and vascular supply from the lateral thoracic or pectoral arteries [2,14]. The intercostobrachial nerve, which provides cutaneous innervation to the medial upper arm and lateral thoracic wall, is particularly vulnerable to entrapment beneath such muscular variants [15].

In surgical contexts, failure to recognize the AA may result in incomplete lymphadenectomy, hemorrhage, or misidentification as a pathological mass during axillary clearance or breast cancer surgery [16]. Given the potential implications,

knowledge of this variation is essential for surgeons, radiologists, and anatomists alike.

Limitations

As this is a cadaveric case, there is no clinical history or imaging data available to confirm any actual neurovascular compression during life. The anatomical relationships observed suggest potential implications, but these remain speculative without clinical correlation. The absence of dynamic testing, electromyographic data, or patient history limits the ability to draw definitive conclusions regarding symptoms or functional impact.

CONCLUSION

The AA is a well-documented anatomical variant that may go unrecognized in both surgical and radiological contexts. In this case, the AA was found in close proximity to the ICBN, median nerve, and brachial vein, suggesting the possibility of neurovascular interaction during life.

Although no clinical symptoms can be confirmed, the awareness of such anatomical variations is essential for surgeons and radiologists to avoid misdiagnosis and surgical complications. Cadaveric studies remain a valuable tool in elucidating the presence and potential impact of these variants.

Author contribution

Study conception and design: CL, GP, and CC; data collection: CL, GP, and NA; analysis and interpretation of results: CL, GP, NA and GP; draft manuscript preparation: CL, GP and PG. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

No personal or identifiable information is included or disclosed in the study, and all procedures comply with ethical standards commonly applied to anatomical research.

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Conflict of interest

The authors declare that there is no conflict of interest.

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