An Axillary Arch Muscle And Its Clinical Importance- A Case Report
Thirupathi rao Vishnumukkala*1, Srinivasarao Yalakurthi2, Bharath.CH.N.V3, Kannan.M4

1&3 Lecturers, Department of Anatomy, A.S.R.A.M.S, Eluru, Andhra Pradesh, India.
2 Assistant professor, Department of anatomy, K.I.M.S&RI, Amalapurum, Andhrapradesh.
4 Assistant professor, Department of Anatomy, A.S.R.A.M.S, Eluru, Andhra Pradesh, India

ABSTRACT
The axilla is a pyramidal space, situated between the upper lateral part of the chest and the medial side of the arm. Axilla is the area connects the cervical and upper limb regions; most of the important structures from neck region passes through the axilla and reach the upper limb. Knowledge of muscular, vascular, and neural variations in the axilla is of great clinical importance, especially in mastectomies, breast reconstruction, and axillary bypass operations. During routine dissections for undergraduate medical students at Department of Anatomy, in an 84-year-old male cadaver, we found a muscular slip on the right axillary fossa that originated from latissimus dorsi muscle and attached to the deep surface of the tendon of pectoralis major muscle. The axillary artery proximal to the arch muscle showed variable course. The compression of neurovascular bundle of axilla by an axillary arch muscle is discussed in literature. Presence of an axillary arch muscle has immense clinical and morphological significance.

KEYWORDS: Axilla, Axillary arch, Latissimus dorsi, Neurovascular bundle, Variations.

INTRODUCTION
The axillary arch muscle is an accessory muscle that extends between the pectoralis major and latissimus dorsi [1]. Among the variety of terminology that describes this variant structure as “Achselbogen”, “axillopectoral muscle”, “axillary arch”, “Langer’s axillary arch” or “muscular axillary arch” [2], we prefer the term “axillary arch” (“arcus axillaris” in Latin) in this report. The axillary arch is a variant muscular slip of this muscle and is about 7 to 10 cm in length, splits from the upper edge of the latissimus dorsi and crosses the axilla in front of the axillary vessels and nerves [3]. Ramsay, in 1795, described the axillary arch for the first time. He gave the description of a muscle bundle connecting pectoral muscle and latissimus dorsi [4]. However, the muscle has been named after Langer who gave the first description of the muscle in 1846 [5]. The incidence of axillary arch muscle reported in different population groups as 7% in Japanese, 10% in Belgian, 0.25% in British Population [6].

Axillary arch can receive nerve fibers from the lateral pectoral nerve, medial pectoral nerve, intercostobrachial nerve or thoracodorsal nerve [2]. Its embryonic origin is not clear and some anatomists consider muscular arches of the axilla as rudimentary phylogenetic remnants of the panniculus carnosus [7]. Primarily, the axilla contains the diverging elements derived from the brachial plexus and axillary vessels [1]. Occasional presence of an anomalous muscle i.e. axillary arch muscle and the relative closeness of...
vital structures are of importance to the surgeons
and also for academic purposes.
Knowledge of muscular, vascular, and neural
variations in the axillary region is of clinical
importance in mastectomies, breast
reconstruction, and axillary bypass operations [8].
The axillary arch can cause thoracic outlet
syndrome and shoulder instability. Entrapment of
the neurovascular bundle within the arch can lead
to entrapment syndrome. In addition, the
axillary arch hides a small group of lateral axillary
nodes, which can mislead the surgeon during
breast surgery [9].

CASE REPORT
During routine dissection of the axilla for
undergraduate teaching in the Department of
Anatomy, allure sitarama raju academy of medical
sciences, Eluru, Andhpradesh, India, an axillary
arch crossing the distal part of axillary artery and
vein as well as the nerves related to them was
observed on the right upper limb of a 85-year-old
male cadaver [Figures 1, 2]. The fleshy fibers of
axillary arch were attached posteriorly to the belly
of latissimus dorsi just proximal to its insertion.
Anteriorly the fibers were merging with the fleshy
fibers of pectoralis major on its deeper surface.
The muscle slip was about 9 cm in length and was
passing superficially across the neurovascular
bundle (3rd part of axillary artery, distal part of
axillary vein, median nerve, and medial cutaneous
erve of forearm and ulnar nerve which are
sandwiched between the artery & vein) of the
axilla. The axillary arch was mostly muscular and
partly fibrous. The muscular slip at the base
originated from the latissimus dorsi, which were
2.1 cm wide and 7.5 cm long. The fibrous part of
the arch, measuring 1.5 cm in length and 0.5 cm
in width, was attached to the deeper surface of the
pectoralis major [Figure 2].

Fig 1: Axillary arch muscle arising from latissimus dorsi muscle.
DISCUSSION

The axillary arch, an infrequent and often overlooked variant of the latissimus dorsi, has been recognized in 0.25%–37.5% of subjects, depending on the population studied [10]. The axillary arch is considered as one of the common variations in the axillary region. However, the origin, course, insertion, tissue composition, and dimensions of the axillary arch are variable [5]. The axillary arch may arise from the latissimus dorsi muscle, either directly or indirectly with an interposed tendon [5].

The most common insertion of axillary arch is as a single muscular band into the muscles including pectoralis major, pectoralis minor, coracobrachialis, short head of the biceps brachii, teres major or to the coracoid process or to the neighboring axillary or brachial fascia [5, 10]. In the present case, the male cadaver had a unilateral axillary arch on the right side. A major part of the axillary arch was made up of a muscular band, which is rarely reported in the literature.

Tobler reported couple of cases where in one of the cases it was inserted into the fascia covering the biceps brachii and the coracoid process and in the other case insertion was into the pectoralis major tendon (muscular part) and coracoid process (aponeurotic part) [5]. Similarly, the cases of up to three tendinous insertions were reported by Langer and Dharap [5, 11].

An axillary arch reported by Turgut et al., was unique in its attachment. It was originating from the coracoid process of the scapula and extending to the long head of triceps brachii muscle [12]. A case of axillary arch with two slips entrapping neurovascular bundle in axilla is reported by Koshy et al. [13]. The most widely accepted view of embryological development of the axillary arch suggests that it is a remnant of the panniculus carnosus found in mammals [5].

During the embryonic period, limb muscles arise in situ from the mesenchyme, which in turn is derived from the somatic layer of lateral plate mesoderm that surrounds the developing bone. As described by Cihak et al. [14], the ontogenesis of muscle has 4 fundamental phases. During phase 3, muscle primordia from different layers fuse to form a single muscle, while some muscle primordia disappear through cell death in spite of differentiated myofilaments [15]. In phase 4, connective tissue elements develop and start their integration with muscle fibres. In the present case, the anomaly probably arose during phases 3 and 4, during which the majority of muscle fibres must
have undergone apoptosis (during phase 3). The fibrous slip of the axillary arch might be persistent connective tissue formed between the latissimus dorsi and the pectoralis major muscle. Identification of the axillary arch and its variations may help avoid accidental injury to axillary vessels and the brachial plexus during surgical procedures.

The axillary arch can pose difficulty during sentinel lymph node biopsy because the slip stretches in the hyperabducted position and shifts the node higher [16]. The latissimus dorsi is of clinical significance, especially in breast cancer surgeries, because the deep fascia surrounding the muscle is continuous anteriorly with the axillary fascia, and the nerve supply to this muscle traverses the axilla [17]. The anterior edge of the latissimus dorsi marks the dorsal extent of a total mastectomy [18]. Knowledge of possible variations in the region of axilla especially axillary arch is essential for the clinicians and surgeons during the clinical examinations and when dealing with any investigative surgical procedures or a case of injury to the axilla. Axillary arch may obscure lymph nodes and may be responsible for compressive pathologies of the axillary vessels and brachial plexus. Hence, surgeons have to keep them in mind during axillary lymphadenectomy [4]. Axillary arch crossing the axillary vessels and causing an obstruction has also been reported [19]. The potential presence of an axillary arch presents several clinical considerations for the physical therapist. The existence of an axillary arch should be considered in patients with signs and symptoms consistent with upper extremity neurovascular compromise similar to thoracic outlet syndrome. Including this variant in the differential diagnostic process may assist physical therapists in the management of patients with signs and symptoms consistent with thoracic outlet syndrome [20].

CONCLUSION: To conclude, we would like to state that it is very essential not only for the anatomists but also for the clinicians and surgeons to be aware of the probable variations of the axillary arch for proper diagnosis and planning of operative treatment. Our observations in the present case will supplement the knowledge of variations in the anatomical sciences.

ACKNOWLEDGEMENT

I wish to express my indebtedness and grateful thanks to Mr. M. Kannan, Assistant professor, Department of Anatomy, ASRAMS, Eluru, for his valuable guidance and constant encouragement throughout the course, and screening this work.

REFERENCES:


[9] Daniels IR, Della Rovera GQ. The axillary arch of Langer—the most common muscular


*Corresponding author: Thirupathi Rao. Vishnumukkala E-mail: thirusree.rao56@gmail.com