



## THE ANATOMICAL STUDY AND CLINICAL IMPORTANCE OF THE AXILLARY ARCH

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### ABSTRACT

The Anatomical Variant of axillary musculature, the axillary arch muscle of Langer is of clinical and surgical importance leading to neurovascular compression syndrome and impairs shoulder movements. We observed the cadavers in our routine dissection in department of anatomy at Mamata Medical College, Khammam. In Our routine dissection, we observed the muscular slip extending from latissimusdorsi to pectoralis major, arching over axillary vessels and cords& branches of brachial plexus. The axillary arch may compress the neurovascular bundle (second part of axillary artery, axillary vein, cords of brachial plexus) leading to thoracic outlet syndrome and shoulder instability.

**Keywords:** Axilla, Anomalous muscle, Langers muscle, Axillary arch.

### INTRODUCTION

The anterior wall of the axilla extends from the clavicle to the anterior axillary fold containing two pectoral muscles, the subclavius muscle and the fascia enclosing them. The posterior wall consist of Superiorly, Lateral part of the costal surface of the scapula covered by subscapularis, Inferiorly, The posterior axillary fold formed by the teresmajor muscle with latissimusdorsi winding round its lower border to reach its anterior surface. The convex medial wall is the lateral wall of the thorax (First five ribs and inter costal spaces) covered by serratus anterior. The humerus lies in the lateral angle covered by the upper parts of the biceps and coraco brachialis muscles. The apex of the axilla bounded by the clavicle, first rib and upper border of the scapula is continues medially with superior aperture of the thorax and root of the neck. From them it receives axillary vessels and the nerves the brachial plexus. These descend through the lateral part of the axilla to the arm and form the contents of the axilla together with the axillary lymph nodes and loose fatty tissue.

Contents of the axilla: 1) Axillary artery and its branches, 2) Axillary vein and its tributaries 3) Cords of brachial plexus and their branches, long thoracic and inter costo brachial nerves 4) Axillary lymph nodes and their

afferent and efferent connections and 5) Axillary Fat. The Pyramidal axillary area contains axillary vessels, cords and branches of brachial plexus, lymph nodes, loose areolar tissue with fat and tail of breast [1].

The Pectoralis major muscle having accessory muscle slips from ribs and costal cartilages, one may extend to latissimusdorsi in posterior axillary fold crossing axillary vessels and nerves calling it as axillary arch, axillo-pectoral muscle, muscular axillary arch, Langers axillary arch, pectoraldorsalis muscle [1-3], it is named by Ramsay 1<sup>st</sup> in 1795 and Langer in 1846, a trouble some variation [4]. It is commonly seen in Chinese, Japanese 7%, Indians 1.47%. Testut in 1884 classified axillary arch a remnant of panniculus-carnosus, an atavistic type of muscle, well developed in apes than humans [2, 3]. As 1) Complete type extending from axillary part of latissimusdorsi to pectoralis major tendon insertion on to the humerus. 2) Incomplete type, extending from latissimusdorsi to axillary fascia, bicepsbrachi muscle, coracobrachialis or to the coracoids process [5], getting nerve supply from thoracodorsal nerve, median pectoral nerve, intercostobrachial nerve [6,7]. Presently we got 3 complete types of axillary arches.

## METHODS

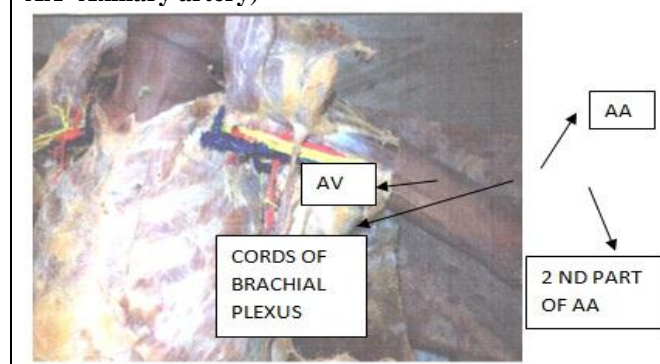
In our routine dissection, Mamata Medical College, Khammam, we observed the present anomalous muscles slips in 2 male cadavers and 1 female cadaver out of 30 cadavers of 60 axillary dissections.

With the help of vernier calipers, we measured the length and breadth of the muscular slips. The arch is passing superficial to the third part of axillary vessels and cords and branches of brachial plexus. The muscular slip is fleshy throughout its length.

## RESULTS

Out of 60 axillae dissected 3 axillary arches found, a unilateral arrangement, results are summarized below table. The cases found to follow Testut's description of a complete and incomplete axillary arches [7]. They originated at the latissimusdorsi muscle level and digitally adherent to the pectoralis major tendon, posterior side at the humeral. Insertion level: This is muscular slip passes to the axillary cavity, closely related to the neurovascular bundle.

**Figure 1. Photograph Showing that Left Axillary Arch (AA) Covers Neurovascular Bundle (AV=Axillary vein, AA=Axillary artery)**



**Figure 2. Photograph Showing Right Axillary Arch Covers the Neurovascular Bundle. PM=Pectoralis Major, LD=Lattismus Dorsi**



**Table 1. Observations**

S.No.	Cadaver	Findings	L&B
1	Male	Right Axilla	8X0.7 cms
2	Male	No Anomaly	
3	Male	No Anomaly	
4	Male	No Anomaly	
5	Male	No Anomaly	
6	Male	No Anomaly	
7	Male	No Anomaly	
8	Female	Left Axilla	8X0.65cms
9	Male	No Anomaly	
10	Male	No Anomaly	
11	Male	No Anomaly	
12	Male	No Anomaly	
13	Male	No Anomaly	
14	Male	No Anomaly	
15	Male	No Anomaly	
16	Female	No Anomaly	
17	Male	No Anomaly	
18	Male	No Anomaly	
19	Male	No Anomaly	
20	Male	No Anomaly	
21	Male	No Anomaly	
22	Male	No Anomaly	
23	Male	No Anomaly	
24	Male	No Anomaly	
25	Female	No Anomaly	
26	Male	No Anomaly	

27	Male	Right Axilla	7X0.8cms
28	Male	No Anomaly	
29	Male	No Anomaly	
30	Male	No Anomaly	

The length and breadth of muscular strips:

- 1) Male Cadaver muscular strip Length X Breadth 8X0.7 cms
- 2) Female Cadaver muscular strip Length X Breadth 8X0.65 cms
- 3) Male Cadaver muscular strip Length X Breadth 7X0.8 cms

## DISCUSSION

Merido-Velasco et al in his 32 human dissected cadavers found 4 axillary arches in 3 cadavers. In one cadaver it was bilateral axillary arches [7]. In I<sup>st</sup> cadaver axillary arch is bilateral and complete type crossing anteriorly the neuro vascular bundle having nerve supply from thoraco dorsal nerve. In II<sup>nd</sup> cadaver axillary arch is unilateral and incomplete type crossing anteriorly the neuro vascular bundle, attached to coracobrachialis muscle with nerve supply from thoraco dorsal nerve. In III<sup>rd</sup> cadaver axillary arch is unilateral and incomplete type crossing posterior to neuro vascular bundle attached to coracoids process. The First 2 cadavers the axillary arch can compress neuro vascular bundle cause in thoraco outlet syndrome and hyper abduction syndrome [8]. Bertone VH et al found 9 axillary arches in 78 human cadavers' axillary dissections stating that during surgical procedure lymph node staging and lymph adenectomy and compression of axillary vessels and brachial plexus [9]. Smith AR dissected a male cadaver to teach physical therapy students, found bilateral incomplete axillary arch crossing anteriorly – can compress neuro vascular bundle causing abduction and external rotation of shoulder [10].

Langer's arch can be palpable as and axillary mass in clinical exam with differential diagnosis as enlarged lymph node or soft tissue tumor. Hafner et al presented 2 female patients of 15 and 17 years of age with complaints of intermittent swelling, pain and arm with bluish colour with axillary swelling [11]. Natsis et al, during his axillary lymph adenectomy found 3 Langers axillary arches from the pectoralis quartus and chondroepitrochlearis muscles, covering lateral group of level I lymph nodes [12]. MRI is the most suitable mode to identify axillary arch in upper limb pain and numbness patients.

## CONCLUSION

Due to increasing surgical procedures in axillary area for breast cancer, reconstructive procedures and axillary bypass operations, the surgeon should keep in mind that presence of axillary arch in patients with fullness of axilla, palpable axillary mass indicate presence of axillary arch – having signs and symptoms of upper limb neuro vascular compression which can be relieved by excision of axillary arch

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