

“A Cadaveric Study of Axillary Arch in Eastern India”.

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ABSTRACT

Axillary arch or Langer’s muscle connects the pectoralis major muscle with latissimus dorsi thereby crossing the axillary vessels. The axillary arch can lead to a host of clinical conditions like axillary vein entrapment; neurovascular and lymphatic compression; interference with surgical access to axilla during axillary lymph node dissection in surgery of cancer breast and latissimus dorsi transplants. In the current study, 30 formalin preserved adult upper limbs (15 right and 15 left) belonging to males were dissected and the presence of axillary arch was noted. We observed 2 unilateral axillary arches (1 in right upper limbs and 1 in left upper limb) and the frequency was noted to be 6.66% in the study. The findings of the study will be of immense utility for surgeons in differential diagnosis of axillary swellings and surgical procedures of the shoulder joint.

Key words- Axillary arch, latissimus dorsi, neurovascular bundle.

INTRODUCTION

The axillary arch or Langer’s muscle is an accessory band of muscle extending between latissimus dorsi and pectoralis major¹. It passes from the midpoint of the posterior axillary fold crossing over the axillary vessels and nerve and ends by joining with pectoralis major, coracobrachialis or fascia covering the biceps brachii². The pectoral muscle mass is supposed to be the developmental source of axillary arch and hence usually innervated by the medial pectoral nerve³. It may get supplied by lateral pectoral nerve, thoracodorsal nerve or intercostobrachial nerve^{4,5}. The muscular arch may join the long head of triceps brachii, teres major, pectoralis minor, medial epicondyle of humerus or coracoid process of scapula⁶. Further the muscular arch may be a remnant of panniculus carnosus⁷. This arch is also described as an atavistic anomaly in the axillary region⁸. The axillary arch can be muscular, fibrous or musculo-tendinous.

Knowledge of neurovascular and muscular anomalies in the axilla is of great clinical significance in breast reconstruction, axillary bypass operations and during mastectomy⁹. The axillary muscular arch can result in shoulder instability and thoracic outlet syndrome. The axillary arch can mask the lateral group of axillary lymph nodes which can be misleading during breast surgeries¹⁰.

As the axillary arch is an important anatomical variation with significant clinical implications, we undertook the current study to find out the presence of the said structure in cadavers of Eastern India.

METHODS

The current study was a descriptive cross sectional study conducted on 15 formalin preserved cadavers used for teaching gross anatomy to MBBS students. All the cadavers belonged to adult males. The axillae of the cadavers were dissected with classical incisions. The structures were cleaned and the axillae were explored for the presence of axillary arch. When found the axillary arch was studied in detail measuring its dimensions and noting its extent. The axillary arches were cleaned and photographed as well.

RESULTS

We observed two unilateral axillary arches- one in a right upper limb (Figure 1) and another in a left upper limb (Figure 2). So the frequency was 6.66% (2 out of 30 upper limbs). Both of them extended from latissimus dorsi to pectoralis major. The right one measured 7 cm in length and 8 mm in width whereas the left one measured 9 cm in length and 7 mm in width.

DISCUSSION

The axilla is a fascial lined pyramidal tent shaped region and serves as a portal for entry of neurovascular bundle of neck to superior extremity. The axilla also harbours the surgically important axillary lymph nodes. An anatomical variant known as the 'axillary arch of Langer' is a muscular or musculo-tendinous band demonstrated in axilla stretching across the neurovascular bundle of axilla. It extends between lower border of latissimus dorsi to the multilamellar tendinous insertion of pectoralis major¹¹. Another common variant is Chondro-epitrochlearis extending between pectoralis major to medial epicondyle of humerus¹². Cases have been observed where the slip extended from latissimus dorsi to coracoid process of scapula, pectoralis minor, short head of biceps brachii, coracobrachialis, teres major, ribs and costal cartilages¹³.

In the current study the frequency was obtained to be 6.66% (2 out of 30 upper limbs). Many other authors have reported the occurrence of the axillary arch as follows- 0.2% by Serpell and Baum¹¹; 3.8% by Turgut et al¹⁴; 8.7% by Clarys et al¹⁵; 3.33% by Bharambe and Arole¹⁶; 1.47% by Pai¹⁷ and 1.66% by Divya Shanti and Vasudha¹⁸. The last three amongst the above are Indian studies.

Any musculo-tendinous band in the axilla can impinge on the neurovascular bundle in the region thereby causing compression of these structures and subsequent vascular stasis resulting in thromboembolic phenomena. This can also cause nerve compression, hyperabduction syndrome, ischaemic arterial occlusion and edema¹⁹. An axillary arch impinging on lateral axillary lymph nodes can hinder their removal during surgery of cancer breast and leads to recurrence of breast cancer¹⁰. After removal of latissimus dorsi myocutaneous flap in breast reconstruction surgery may result in axillary vein entrapment syndrome and subsequent postoperative edema of the superior extremity²⁰.

CONCLUSION

It's difficult to apprehend axillary arch clinically. However computerized tomography scan and magnetic resonance imaging can detect axillary arch. Therefore the knowledge of the exact extent and attachments of the arch becomes crucial in clinical setting.

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FIGURE 1 (Arrow head points to right sided axillary arch)



FIGURE 2 (Arrow head points to left sided axillary arch)