

## CASE REPORT

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### Axillary arch of Langer: a rare variation

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#### ABSTRACT

The axillary arch of Langer is the most common muscular variation in the axilla with frequency of 7% to 27%. Due to its frequency, clinicians should be aware of this variant because misidentifications can lead to wrong diagnosis and massive surgical complications, which could easily be avoided by intimate anatomical knowledge of the axillar region and its most frequent variants. A case of an “Axillary Arch of Langer” was reported on a routine Axillary lymphadenectomy procedure of breast carcinoma, which is originated from latissimus dorsi and inserted to biceps brachii. Since knowledge of the mentioned anomaly is important for surgeons to prevent attainable injury to axillary vessels and brachial plexuses, the embryological derivation and clinical significance of this muscle were discussed in this probe.

**Key words:** axillary arch of langer, latissimus dorsi, biceps brachii

#### INTRODUCTION

There is a rare muscular-tendinous structure of the axilla which is named Axillary Arch Muscle (AAM). Various insertions of this muscular anomaly have been observed such as: coracoid of the scapula, medial epicondyle of the humerus, teres major, long head of the triceps brachii, coracobrachialis or biceps brachii, and pectoralis minor. The muscle that mentioned above wildly originates from the latissimus dorsi and inserts onto intopectoralis major, the short head of the biceps brachii and the coracoid process of the scapula. It is worth to mention, there is little information about its embryologic origin while it is not obvious, it seems the embryological derivation is from the panniculus carnosus muscle of lower mammals. The nervous supply of AAM widely has been done by medial pectoral nerve and thoracodorsal nerve. The clinical significance of AAM has been described as a potential cause of neurovascular compression in the axillary zone and hyper abduction syndrome in comparison to the other findings. Therefore, the mentioned arch is the cause of thoracic outlet syndrome and shoulder disability. This study demonstrated the cited anatomical anomaly in a woman who has undergone a modified radical mastectomy operation for breast cancer.

#### CASE REPORT

The researchers present a unilateral occurrence of left AAM in a 47-year-old woman in modified radical mastectomy (MRM) procedure. The AAM was discovered during lymph node dissection of left axillary in a case of left breast cancer. It originates from medial boarder of the left latissimus dorsi muscle and inserts to the short head of the biceps brachii. It is noteworthy that the clinical consideration of AAM is vital because it crosses anteriorly over the brachial plexus and axillary artery. This muscle measured 12 cm in length and 2.5 cm in width. The arterial supply of the Langer muscle was from a branch arising from the lateral thoracic artery. A branch of the medial pectoral nerve supplies the nerve. (Fig. 1)

#### DISCUSSION

The axillary arch is an anomalous slip of muscle which arises from the body of the latissimus dorsi and inserts into the pectoralis major muscle.<sup>1</sup> Ramsay in 1795 has first observed the anomaly, by the time it was confirmed by Langer in 1864.<sup>1,2</sup> It is noteworthy that Testut ordered the cited variation muscle as both “complete” and “incomplete”.<sup>3</sup> In the complete form, the tendon of the pectoralis major is its insertion, while in the incomplete form the latissimus dorsi muscle, biceps brachii muscle, coracobrachialis muscle, the distal end of the bicipital groove, the inferior edge of the pectoralis minor muscle or the coracoid process are its insertions.<sup>4</sup> The frequency of the structure varies between populace, which is

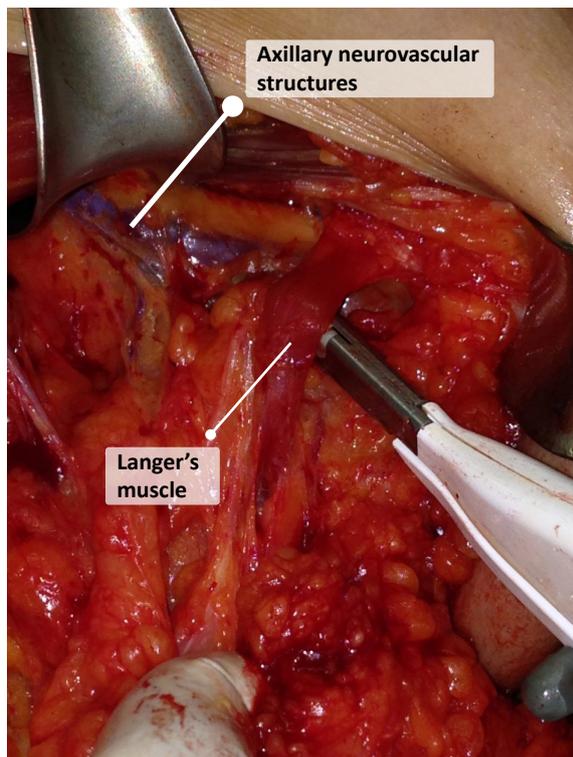
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**Figure 1,** The Langer muscle arising from latissimus dorsi muscle in a left axillary of a girl during lymph nodes dissection in modified radical mastectomy.

much higher in cadaver dissections other than reported during surgical interventions, by contrast a common frequency of 7–8% which is mentioned earlier in many literatures.<sup>5</sup>

Two shapes of this muscle have been described as a triangular and fusiform. The axillary muscle in this study is triangular with an incomplete form. Various lengths and widths of AAM were reported between 6 to 15 cm in length and 0.5 to 4 cm in width in the literature. In the current study either the length or width of Langer muscle was measured as 12 cm in length and 1.5 cm in width. Though the existence of AAM has no obvious data, in some cases it was observed on the left side and in others on the right or bilaterally axillary regions, while in the current study it was located on the left side.

Jelev et al. pointed out two main groups of clinical axillary arches as “superficial” and “deep”. Superficial arch group is the most prevalent form of the arch which is usually extended between the tendon of the latissimus dorsi and the structures around the superior-anterior part of the humerus. These arches cross in front of the neurovascular bundle, and the veins could be deeply affected. In the meantime the “deep”

arch group constitutes the structures situated deeply on the posterior and lateral walls of the axilla. As mentioned before, the arches commonly cross only parts of the neurovascular bundle and the axillary and radial nerves could possibly be compressed.<sup>5</sup> The case which was introduced is recognised as superficial axillary arch group.

The axillary arch may be found during surgical exploration in the region of the axilla. Hence, the identification of such muscle is very significant for surgeons in performing secure and successful axillary surgery.<sup>5</sup> If an axillary arch is seen during axillary lymphadenectomy, the lymph nodes of posterior and lateral to the arch should be excised.<sup>4</sup> Axillopectoral muscle makes neurovascular compression (axillary vein entrapment, major thrombosis of upper extremity), costoclavicular compression syndrome, hyperabduction syndrome, and thoracic outlet syndrome and shoulder instability. Therefore, the surgeons should consider the primary difference in the process of exploring the mentioned area.

## CONCLUSION

Knowledge of Langer muscle is clinically vital in the procedure of performing surgery in axillary region. Afterward recognition of Langer's arch, it should be separated to permit sufficient exposure of axillary contents to perform a totally lymphatic dissection and preserve vascular, lymphatic and nervous structures.

## CONFLICT OF INTEREST

None.

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