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Case Report

Axilla; a rare variation: axillary arch muscle

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ABSTRACT

Axillary arch muscle or the Langer's muscle is one of the rare muscular variation in the axillary region. It is the additional muscle slip extending from latissimus dorsi in the posterior fold of axilla to the pectoralis major or other neighbouring muscles and bones. In the present article a case of 68 yrs old female cadaver with axillary arch in the left axillary region is reported. It originated from the anterior border of lattissimus dorsi and merged with the short head of biceps and pectoralis major muscles. The arch was compressing the axillary vein as well as the branches of the cords of brachial plexus. The presence of the muscle has important clinical implications, as the position, unilateral presence, axillary vein entrapment, multiple insertions makes the case most complicated. Recognising the presence of axillary arch muscle in such complex form is important in clinical practice as the arch causes the difficulties in staging lymph nodes, axillary surgery, thoracic outlet syndrome, shoulder instability or cosmetic problems. The anatomy, embryological and clinical importance of this muscular variation is discussed in this paper

Keywords: Langer's arch, Axillary muscular arch, Thoracic outlet syndrome, Axillary anatomy, Axillary vein entrapment, Panniculus carnosus

INTRODUCTION

Anatomical variations of the axilla are of great relevance due to increasing surgeries of this region for breast cancer, reconstruction procedures and axillary by-pass operations.[1] During the past two centuries, the anatomical variations of the axilla have been described in the text books of human anatomy and operative surgery due to its surgical importance.[2]

The axillary arch muscle also known as Langer's muscle, axillo-pectoral muscle or the "Achselbogen Muskel" is a rare anomaly in the axilla. It is described as a thin muscular slip extending from the lattissimus dorsi to the pectoralis major muscle.[3] This variation occurs in 7% of the population and more common in females than males, also it is usually bilateral but can occur unilaterally.[2] The presence of such an accessory muscle in the axilla simulating an axillary mass can exert pressure on the neighbouring neurovascular bundle or lymph routes, leading to a broad range of symptoms.[4] This axillary arch muscle is one of the reasons of the thoracic outlet and shoulder instability.[5] The clinical significance of the axillary arch makes it important for the surgeons to know such variations before hand.

CASE REPORT

The axillary arch muscle was found on left side of axilla of 68 years old female cadaver during routine dissection of upper limb for the undergraduate students held at; Dr. D. Y. Patil Medical College of Kolhapur. This muscle

was seen as a muscular slip originating from the anterior border of left latissimus dorsi muscle, measuring 10 cm in length and 2cm in width at its broadest point. On the right side there was no presence of this muscle.

The course of axillary arch muscle was directed towards the humerus, crossing anteriorly over the axillary vein, axillary artery and the brachial plexus. In addition the axillary arch muscle was divided into two slips; an upper and lower (Figure 1). The upper slip was larger and more fleshy and was continuous with the fascia on the medial aspect of the short head of biceps brachii muscle. The lower slip was smaller and less fleshy and was continuous with the fibres of pectoralis major muscle on the deeper surface.

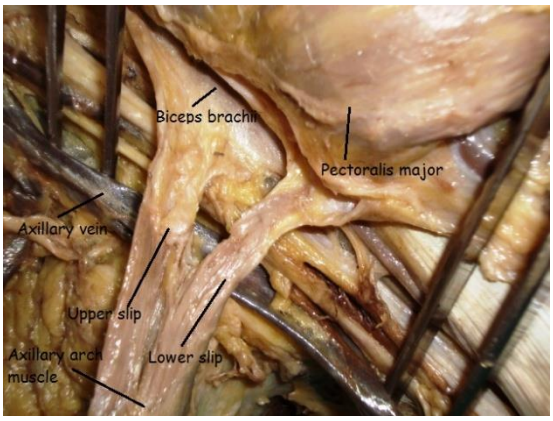

Figure 1: Upper and lower slips of axillary arch muscle.

Further both the slips were resting on axillary vein. The axillary vein also showed gross changes in the vessel wall in this region indicating the effect of compression by the axillary arch muscle. The axillary vein also showed dilatation proximally with narrowing at the site of crossing of the axillary arch muscle while distally the vein showed normal calibre (Figure 2).

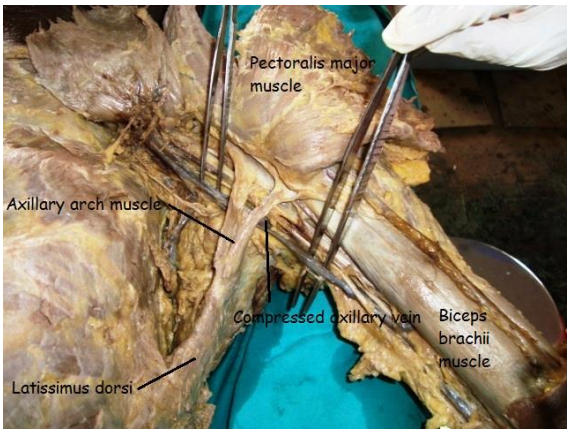

Figure 2: Axillary arch muscle compressing the axillary vein.

The nerve supplying the axillary arch muscle was traced and found that it arises from the adjacent thoracodorsal nerve, which also supplies the latissimus dorsi muscle.

DISCUSSION

Muscular variations of the upper limb related to pectoralis major and latissimus dorsi have been reported before but still it is important to report the rare variations as they arise. An axilla or the armpit is the space between the upper part of the arm and the side of the thorax, bounded in front by the pectoralis major muscle, behind by the subscapularis and latissimus dorsi muscle, medially by serratus anterior muscle and laterally by the shaft of humerus. It contains neurovascular bundle and lymph nodes draining the upper limb and the lateral wall of thorax. The axillary arch was first identified by Alexander Ramsay in 1795, though reported in 1812. However it was Langer (1846) who described the muscle more accurately so that thereafter it was known as the Langer's arch.[2] Langer's arch is seen as a single band, but it can divide into double or rarely mulitiple slips which extend across the axilla. In its complete and common form, it arises from latissimus dorsi and gets inserted into the trialminar tendon of pectoralis major on the humerus; while in its incomplete form it presents with varying sites of insertions such as pectoralis major, coracoids process, first rib, axillary fascia or coracobrachialis.[2] The cases of three tendineous intersections were also reported by Dharap.[6,7] A case of axillary arch with two slips entrapping neurovascular bundle in axilla was reported by Koshy et al.[8] In our case the incomplete form of Langer's muscle having double slips of insertion makes it a rare variant.

Clinically the axillary arch muscle has been implicated in the costo-clavicular compression syndrome, axillary vein entrapment and median nerve entrapment.[3] The existence of such arch should be considered in the patients with signs and symptoms consistent with upper extremity neurovascular compression similar to thoracic outlet syndrome.[6] The presence of axillary arch muscle during physical examination may be detected as a palpable mass within the axilla or a loss of typical axillary concavity. However a physical examination may not necessarily reveal all the variants of axillary arch muscle; so magnetic resonance imaging must be needed for accurate diagnosis.[3]

The axillary arch can pose difficulty during sentinel lymph node biopsy because the slip stretches in the hyperabducted position and shifts the node higher. Also the latissimus dorsi is of clinical significance especially in the 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, the anterior edge of the latissimus dorsi marks the dorsal extent of total mastectomy. Preservation of the thoracodorsal nerve and vessels is of utmost importance in the preservation of muscle for reconstructive procedures.[9]

Hyperabduction and lateral rotation of the shoulder may cause excessive stretch on the neurovascular structures, thereby giving rise to neurovascular symptoms in the arm.[10]

In our case presence of axillary vessels and the branches of cords of brachial plexus above and below the variant muscle may impinge the vessels during the hyperabduction of the arm. This variation may cause pain during certain movements of the shoulder. Hence this muscular variation along with the involvement of axillary blood vessels is clinically important because of its potentiality to restrict the abduction of the arm.

Ontogeny

The embryological derivation of Langer's arch remains unknown, but the most reliable theory supports its origin from the panniculus carnosus, which is an embryological remnant of a more extensive sheet of skin along with associated musculature lying at the junction between superficial fascia and subcutaneous fat.[2,6] This structure is well developed in lower animals, particularly in rodents while in higher primates and humans it is evident only as muscle such as platysma and dartos; in the remainder of body it becomes vestigial.

In lower animals the panniculus carnosus is highly developed to form the pectoral group of muscles. However in man it has regressed because its functional importance is decreased during evolution in favour of wider range of mobility of upper limb. In humans this arch is the most common embryological remnant of panniculus carnosus in the pectoral group of muscles.[2] Other view suggest that, limb muscles generally arise in situ from the somatopleuric layer of lateral plate mesoderm around the developing bones.[11,12]

During the fundamental phases in the ontogenesis of muscle pattern; in phase III it is seen that some muscle primordia form different layers which fuse to form a single muscle.[13]

Some muscle primordia disappear through cell death, despite the fact that cells within them have differentiated to the point of containing myofilaments. Persistence of some cells between latissimus dorsi and teres major may account for the muscular slip described as in our case.[14]

CONCLUSION

We conclude that reporting of such rare anatomic variant of axillary arch muscle is important in view of its clinical implications. In cases of venous entrapment and other conditions like lymphedema of upper limb, such a variant should always be kept in mind. Knowledge of axillary arch muscle would help the surgeons to divide it to allow proper exposure of axillary contents during operations on carcinoma of breast or axillary lymphatic dissection.

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