Axillary arch: a variation of latissimus dorsi muscle

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Abstract

The axillary arch of Langer (Axillopectoral muscle) is the most common anatomical variant of the axillary musculature. During the dissection of a 63-year-old male cadaver, an unusual muscle band was encountered bilaterally and identified as an axillary arch. We here describe the morphology and relationships of the axillary arch in the light of previous such reports. The knowledge of this muscle variation is important for the clinicians, with regards to its potential to cause significant iatrogenic functional defects. Anatomical variations of the axilla are of relevance to surgeons, neurologist, radiologists and cosmetic surgeons due to the increasing surgical importance of this region during axillary surgery for breast cancer, reconstruction procedures, and axillary bypass operations. It is important that surgeons operating in the axilla be aware of this common anatomic variant.

Key word: Axilla, muscular variation, Langer’s muscle.

Introduction

Variable muscle slips such as chondroepitrochlearis, dorso-epitrochlearis, Costo-coracoides or axillary arches are occasionally encountered in the axilla1. The axillary arch is a muscular slip that occasionally arises from the edge of the latissimus dorsi, from the middle of the posterior fold of the axilla, and crosses the axilla in front of the axillary vessels and nerves to join the under-surface of the tendon of the pectoralis major, the coracobrachialis, or the fascia over the biceps. Ramsay (1812) was the first author to observe this anomaly and stated that in 1795 he observed an oblong muscle that stretched from the pectoralis major to the latissimus dorsi and teres major1. Since the first descriptions of the axillary arch were made by Langer in 1846, the arch has sometimes been referred to as Langer’s axillary arch1. Sachatello identified this variation as the axillopectoral muscle in 19774. A frequency of 7-8 % for this muscle anomaly appears in the standard anatomical text book5.

Case report

During the routine dissection of a 63-year-old male cadaver in the Department of Anatomy, Pravara Institute of Medical Sciences, Loni, Maharashtra, we came across a bilateral axillary arch muscle. The dissected axillary arches were photographed with the shoulder abducted and externally rotated. The caudal and cranial attachments were identified, and the length and width of the muscular bands were measured. On right side, a fibromuscular band extended from the lower border of the latissimus dorsi muscle to the inferior surface of the pectoralis major mostly, partly to the coracobrachialis and long head of biceps brachii. Axillary arch was 7.6 cm in length. (Fig.1).

The muscular slip at the broad muscular end originated from the lower border of latissimus dorsi and was 5.2 cm long and 2.3 cm wide. The tendinous part of the arch, measuring 2.4 cm in length and 1.1 cm in width, passes anterior to brachial plexus, axillary artery and axillary vein. It is inserted into deep surface of pectoralis major muscle, and blend with coracobrachialis and long head of biceps brachii. Blood supply was derived from a branch from circumflex scapular artery. Latissimus dorsi had a normal nerve supply from thoracodorsal nerve. On left side the musculotendinous slip was 8.7 cm in length. The muscular part was 7.2 cm in length and 2.2 cm at its broadest point. The fibrous part of arch measured 1.5 cm in length and 1.2 cm in width. The attachments of the left axillary arch were similar to the right axillary arch. (Fig.2).
Variations of the axillary arch muscle have been described by Chiba et al. They have demonstrated a common nerve supply for the axillary arch muscle and the chondroepitrochlearis. The axillary arch muscle has been observed both unilaterally and bilaterally. It is found to coexist in approximately one half of cases of a chondro-epitrochlearis muscle. Condro-epitrochlearis is a rare variation arising from either the pectoralis major muscle, the costal cartilages, or the aponeurosis of the external oblique muscle, and insert onto the pectoral epicondyle, intermuscular septum, or brachial fascia of the inferior arm. On the other hand, some authors also report cases of bilateral axillary arch muscle, although no statistics are provided. Perre and Zeeimulder found it during surgery, while Ko et al. also described a bilateral axillary arch muscle finding observed in mammography. Few cases have been described where the muscle's connections are more complex, inserting at multiple sites. Variations similar to those found in the latissimus dorsi muscle in present case have been reported in the anatomical, and surgical literature. A case of axillary arch with two slips entrapping neurovascular bundle in axilla is reported by Shajan et al.

Possible shoulder stabilization and an improved proprioception were also found both in men and most of the women with axillary arch. Anatomical variations of the axilla are of great relevance due to the increasing surgical importance of this region during surgery for breast cancer, reconstruction procedures, and axillary bypass operations. Lymph node dissection for breast cancer is the most common type of surgery performed in axilla, which may be affected if Langer's arch is encountered. Langer's arch can occasionally be palpable during routine clinical examinations when, presenting as an axillary mass, it can be confused with enlarged lymph nodes or soft tissues tumours. Clinically it has been implicated in costoclavicular compression syndrome, axillary vein entrapment, median nerve entrapment, hyper abduction syndrome, thoracic outlet syndrome, etc.

Abbreviations: AAM-axillary arch muscle; MN-median nerve; AV-axillary vein; PM-pectoralis major; BB-biceps brachii; TDN-thoracodorsal nerve; MCNF-medial cutaneous nerve of forearm; LD-latissimus dorsi; CCB-Coracobrachialis; AA-axillary artery.

Discussion

Axilla is a clinically important region in clinical practice because of presence of axillary lymph nodes which drain vast area including mammary gland, presence of important neurovascular bundle and common usage of latissimus dorsi for reconstructive surgeries. Axillary arch muscle is a common anomaly though rarely noted during clinical examinations resulting in a wide range of clinical effects.
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syndrome and shoulder instability syndrome\textsuperscript{17,18}. The axillary arch should be recognized and excised to expose the axillary artery and vein in patients with trauma and to perform axillary lymphadenectomy or axillary bypass\textsuperscript{19}. According to Petrasek et al\textsuperscript{20}, if an axillary arch is encountered during axillary lymphadenectomy, the lymph nodes posterior and lateral to the arch should be excised. Thus, knowledge of the anatomical variations in this area is necessary for surgical interventions. The axillary arch muscle is situated in such a way that it can conceal lymph nodes and impinge on the brachial plexus, causing symptoms of upper extremity nerve entrapment. Radiologists’ familiarity with the arch can improve their recognition of this muscular variant so that they can communicate appropriate clinical correlations to referring physicians.\textsuperscript{21}

Conclusion

Anomalies such as these draw attention because of its potential to cause significant functional defects, so it is important that surgeons operating in the axilla be aware of this common anatomic variant. Its occurrence is of particular interest to surgeons, orthopedic surgeons, neurologist, radiologist and cosmetic surgeons. We conclude that a method to identify existence of axillary arch in its various complex forms should become an essential step in the planned surgical intervention, so that surgery can be executed safely and successfully.

References


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