Clinical Importance of the Muscular Arch of the Axilla (Axillopectoral muscle, Langer’s Axillary Arch)

H. Üçerler, Z. A. Aktan İkiz, Y. Pınan
Department of Anatomy, Ege University, Medicine Faculty, Izmir, Turkey.

Key words. Axillary Muscular arch ; thoracic outlet syndrome.

Abstract. The muscular arch of the axilla is described in a male cadaver on the left side. The condition may be the result of a factor affecting the intrauterine development. Because this muscular arch causes difficulties in staging lymph nodes, axillary surgery, thoracic outlet syndrome, shoulder instability or cosmetic problems, it should be kept in mind for axillary pathologies.

Introduction

The muscular arch of the axilla (axillopectoral muscle, Langer’s axillary arch) can be described as an anomalous muscular slip of the latissimus dorsi muscle. It generally joins the pectoralis major muscle to insert onto the lateral border of the intertubercular sulcus of the humerus, passing medially and anteriorly to the biceps brachii and coracobrachialis muscles, the axillary artery and commissural veins, the median, ulnar and radial nerves and medial cutaneous nerve of the forearm (1-3). Accessory muscle slips arising from the ribs and costal cartilages have been also described for this region (4).

This arch is one of the reasons of the thoracic outlet syndrome and shoulder instability (3). This anatomical anomaly is now discussed here in the form of a case report.

Case Report

During dissection classes in 2003 in the Department of Anatomy at Ege University Medicine Faculty, the muscular arch of the axilla was observed in a 72 year-old male cadaver on the left side (Figs. 1, 2).

This muscular arch was extending between the latissimus dorsi and the pectoralis major muscles. In this cadaver, the tendon inserted onto the proximal part of the biceps brachii fascial sheath. The axillary artery, veins and the nerves of the brachial plexus were under this muscle arch. This anomalous muscle was supplied by the second (Th2) and third (Th3) intercostobrachial nerves.

The muscle anatomy on the right side was normal.

Discussion

The first description of this muscular arch was done by Ramsay in 1795, after which it was confirmed by Langer in 1864. Later it was described by many authors (3). Although the axillary arch is present in 7-13% of cadaver dissections (5-7), during our dissections since 1989, the muscular arch of the axilla has not been observed. Clinically, the incidence of this muscle varies considerably: from 0.25% to 25% (5, 8). This variable incidence may be related to sample size. Even racial variations may be responsible for this disproportion (5).

Muscular arch of the axilla, the main anatomical variation of the axilla extends from the proximal border of the latissimus dorsi to about the middle of the posterior axillary fold, and it arches across the axilla, anterior to the axillary vessels and nerves, to join the undersurface of the tendon of the pectoralis major, the tendon of the coracobrachialis, or the fascia over the biceps brachii (6). Muscular arch of axilla is usually unilateral but at operation in a 54 year-old woman, a bilateral muscular arch was described by Perri and Zoetmulder (7). It was observed in three cases by Miguel et al. These muscles were originating from latissimus dorsi crossing over the axillary neurovascular bundle and inserting deep to the insertion of pectoralis major or into coracoid process (3). Sachatello reported a patient with high grade intermittent obstruction of the axillary vein due to the anomalous axillopectoral muscle. This muscle extended from the latissimus dorsi to the insertion of the pectoralis major and overlaid the neurovascular bundle in the axilla as in our cadaver (9). The similar anomalous muscles were also determined by Kameda in 10 sides out of 380 sides of 190 human cadavers. This muscle
arose from lateral margin of scapula, the surface of the subscapularis muscle or the latissimus dorsi tendon and inserted on the subscapularis muscle. Kameda classified into three types the muscles on the basis of its nerve supply and its relation to the brachial plexus (10). Dharap observed a triangular muscular slip 3.5 cm long and 2.5 cm wide, in the left side of an adult male cadaver. It was arising from the lower border of latissimus dorsi and inserting by a slender 6 cm long tendon into coracoid process of the scapula (4). KutiyanaWala et al. documented the anatomy of the axilla in 100 patients with breast cancer who had an axillary dissection. There were six patients who had an abnormal band of muscle and/or tendon across the axilla. In two patients, this arose from latissimus dorsi muscle and crossed the axilla medially to insert into the coracoid process. In the others it lay across the axilla passing from latissimus dorsi to the pectoralis major (11).

The chondroepitrochlearis is an anomalous muscular slip as muscular arch of the axilla. This muscle limits the normal range of motion of the upper limb (6, 12). Lin reported a 17 year-old Chinese boy with increasing difficulty in elevating the arms to the sides of the ears and in throwing the ball during basketball or baseball. He thought that the loss of ability to elevate the shoulders had gradually increased over the years. This report was the first, of a patient who had contracture of this muscle. The chondroepitrochlearis has been reported to be almost always associated with the axillopectoral muscle (6).

The latissimus dorsi myocutaneous flap is widely used for breast reconstruction. In presence of the axillary arch, precipitate lymphoedema of the arm was observed in the previous studies. For this reason, if the axillary arch is found at axillary dissection, it should be divided if there is a possibility of a latissimus dorsi flap being required in the future (13).

The anomalous axillopectoral muscle may be the reason of a high grade intermittent obstruction of the axillary vein (14, 9). Boontje described a woman aged 37 with right axillary vein due to the axillopectoral muscle. The symptomatology of this patient was not specific for any particular cause of obstruction (14). Preoperative recognition of this anomaly appears possible by phlebography, history of intermittent axillary vein obstruction, loss of the normal axillary concavity, marked disparity between obvious visual fullness in the axilla, great difficulty encountered in palpating an axillary mass and operation (3, 9).

The most common reason of median nerve compression at level of the axilla has been also reported as being caused by anomalous axillary arch muscles in many cases (15). Awareness of its existence is important because it can give rise to different pathologies and simple excision of this muscle is curative (3, 9).

It should be considered in the existence of axillary masses (3). Its presence may lead to a confusion in staging lymph nodes (5, 11). For example, Daniels et al. determined an axillary arch during a routine axillary lymphadenectomy for breast carcinoma in Royal Marsden Hospital (16). The axillary arch covers a small group of lateral axillary lymph nodes as it courses over the axillary vein (16, 13). If an axillary arch is encountered during axillary lymphadenectomy, the lymph nodes posterior and lateral to the arch should be excised. Missing these nodes during axillary node dissection.
predisposes to local recurrence in patients with melanoma and breast cancer and also inaccurate staging information could negatively affect systemic treatment decisions for breast cancer after surgery (13). Beside this, injury of the axillary vessels and brachial plexus may appear unless it is recognized before surgery because of possibility of mistaking the arch for the true lateral edge of the latissimus dorsi muscle and then dissecting along the arch cephalad (5, 11, 13).

Knowledge of this muscle is important clinically when performing surgery in the axillary region.

References

Z. A. Aktan Ikiz
1382 sok(Gül sokak). No :30, D :11
TUR-35220 Alsancak, Izmir, Turkey
Tel. : +90-232-388 10 98
Fax : +90-232-489 75 40 (Dr. Z. Aslı Aktan Ikiz)
E-mail : asaktan@med.ege.edu.tr
hulyaucerler@hotmail.com