Case Report

The axillary arch of Langer – The most common muscular variation in the axilla

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Summary

A case of an ‘Axillary Arch of Langer’ is reported during a routine axillary lymphadenectomy for breast carcinoma. The features of this muscle are described together with other less common axillary muscular anomalies. Knowledge of these anomalies is important for surgeons performing safe axillary surgery [1].

Introduction

The purpose of this article is to describe the most common anatomical variant of the axillary musculature – ‘The Axillary Arch of Langer’. It has previously been reported as the cause of axillary vein entrapment syndromes, as presenting as an axillary mass, and a role has been suggested in the development of lymphoedema of the upper limb following breast surgery [2–5]. It will also partly cover the lateral group of nodes, so that they may not be fully cleared at operation.

Here, we review the normal anatomy of the axilla and describe this rare muscle which runs across the axillary content. This knowledge is important during axillary lymphadenectomy.

Case report

During a routine axillary dissection in a 49-year old female with a breast carcinoma, on opening the axilla the authors noted an aberrant muscular slip laterally. The initial impression was that this was latissimus dorsi. However, the normal planes were not apparent, and on further careful dissection this muscle was identified. It extended from the lateral edge of the latissimus dorsi muscle across the axillary vessels into the tendon of insertion of pectoralis major, thus identifying this as the ‘Axillary Arch of Langer’. Its nerve supply was not apparent during the dissection. A routine axillary dissection was then performed after dividing this muscle. On questioning the patient, she reported no previous upper limb neurovascular symptoms, and on pre-operative examination no masses had been identified within the axilla.

Review of the surgical anatomy of the axilla and its muscular variations

The axilla is a space confined by muscles and fascial layers containing the neurovascular bundle to the upper limb and its co-laterals and lymphatics. The anterior wall of the axilla is formed by the pectoralis major muscle, the medial wall by serratus anterior and the posterior wall by the subscapularis and latissimus dorsi muscles. The lateral wall contains only fascia – the axillary fascia, which blends distally with the chest wall and proximally with that of the upper limb. This fascial layer is a latero-posterior continuation of the pectoralis major fascia, thus acting like a tent to cover the contents of the axilla.

The pectoralis minor muscle is enveloped by a fascial layer which continues medially to form the clavpectoral fascia, and laterally the suspensory ligament of the axilla. The lymph nodes of the axilla are conventionally divided into levels depending on their relationship with the pectoralis minor muscle:
When performing an axillary dissection, two important structures must be identified and preserved. They are the long thoracic nerve (of Bell) which runs cranio-caudally on the medial wall over the serratus anterior, and the neurovascular bundle to the latissimus dorsi, which runs cranio-caudally on the posterior wall over the latissimus dorsi. This vascular bundle is particularly important as it is the pedicle on which we base our latissimus dorsi myocutaneous flaps.

Discussion

A few rare muscles and tendonous arches have been described within the axilla, arising from the pectoralis major or the latissimus dorsi and having a variable insertion [6]. The most common is the ‘Axillary Arch of Langer’ (Langer’ser Achselbogen), first described in 1846 [7, 8]. This arch, also called ‘The Axillopectoral muscle’, is a flat muscle arising from the anterior axillary portion of the latissimus dorsi. It runs across the neurovascular bundle and is inserted into the posterior aspect of the trilaminar tendon of the pectoralis major close to the humerus (Figure 1). Its innervation is via branches of the nerve to pectoralis minor. The muscle is rendered taut by elevation and abduction of the arm.

It is said to be present in 0.25–7% of the population [3, 5]. In the experience of the senior author, the incidence is 0.8%. (Seventeen cases in approximately 2000 axillary dissections).

This aberrant muscular arch may result in intermittent compression of the axillary vein and may lead to axillary venous thrombosis [9–11]. It has also been implicated in the hyperabduction syndrome [12].

For the surgeon performing an axillary dissection for malignancy the problem may arise of inadequate clearance of the Level I nodes due to the lateral group being partially covered by the axillary arch. This obviously has serious implications for local recurrence which will become more difficult to manage and increase the risk for local morbidity – predominantly lymphoedema. Serpell and Baum recommend that the muscle be divided to prevent axillary vein compression or compression of the lateral lymphatic trunks, thus increasing the risk of lymphoedema [5].

As we have stated, the thoracodorsal neurovascular bundle is important for breast reconstruction using the latissimus dorsi myocutaneous flap, and if the arch is not divided it may result in an entrapment syndrome and flap ischaemia. If the reconstruction is to be performed as a staged procedure, one must emphasise the importance of clearly documenting the abnormality in the operative notes, as it may be a different surgeon who performs the reconstruction.