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Axillary artery injury associated with subpectoral biceps tenodesis: a case report

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Tenotomy or tenodesis of the long head of the biceps tendon can be used to treat anterior shoulder pain believed to be related to biceps tendinopathy. The rationale for tenodesis rather than tenotomy is primarily based on improved aesthetics and maintenance of the functional length of the muscle for higher-demand patients.[14-16] Open subpectoral biceps tenodesis (OSPBT) fixes the long head of the biceps tendon relatively distally, removing it from the bicipital groove where it might continue to produce symptoms.[9]

The long head of the biceps is immediately adjacent to major neurovascular structures in this area.[4] A surgeon operating through a small incision might get disoriented and veer too medially, especially when the patient is in lateral decubitus. Retractors may also place these structures at risk. There are several reports of iatrogenic brachial plexus injury using subpectoral biceps tenodesis.[3,8,10,11] It makes sense that the artery (transitioning from axillary to brachial at this level) might also be at risk (Fig. 1). The present report describes a patient with axillary artery injury during OSPBT.

Case report

A 54-year-old right-hand-dominant male construction worker with left shoulder pain had a partial rotator cuff tear and biceps tendinopathy on magnetic resonance imaging. He chose operative treatment consisting of shoulder arthroscopy, subacromial decompression, distal clavicle excision, and OSPBT.

The patient was positioned in lateral decubitus with the arm in suspended traction. Arthroscopy confirmed degeneration of the attachment of the long head of biceps tendon onto the superior rim of the glenoid and the superior glenoid labrum. An intra-articular biceps tenotomy was performed using electrocautery. Acromioplasty and distal clavicle excision were performed.

A 4-cm longitudinal incision was made just superior to the axillary fold. The pectoralis major muscle was large, and retraction of the tendon was difficult. During the procedure, the surgeon encountered brisk bleeding from the medial aspect of the wound. The bleeding was addressed by packing the wound and applying pressure for a few minutes. After holding pressure, the bleeding stopped. The patient lost approximately 100 mL of blood during this episode of bleeding. The axillary artery and the axillary vein were visually inspected and appeared to be patent, without evidence of injury. The long head of the biceps tendon was retrieved, sutured, and inserted into a drill hole in the humerus using an interference screw just distal to the inferior margin of the pectoralis major tendon.

Before the patient left the operating room, it was noted that a radial pulse was not palpable and that capillary refill was delayed compared with the opposite hand. Doppler imaging failed to identify a brachial, radial, or ulnar artery signal. A postoperative telephone consultation with vascular surgery was obtained, and the patient was

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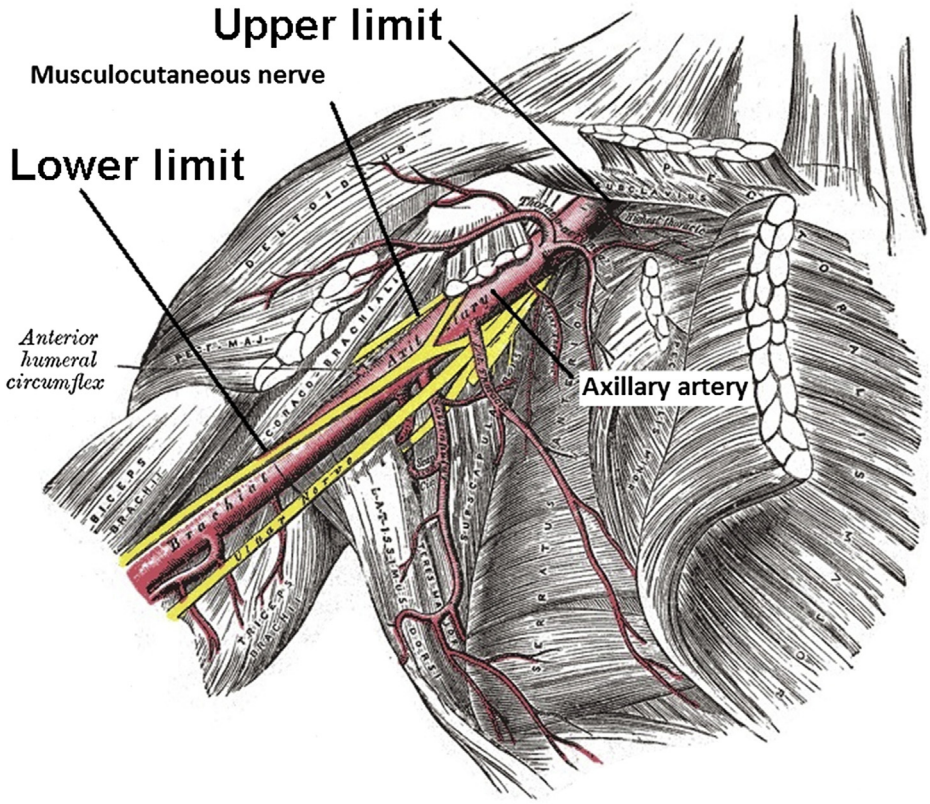

Figure 1 Anatomic illustration demonstrates the proximity of the neurovascular structures in the surgical area. (Häggström M. Medical gallery of Mikael Häggström 2014. Wikiversity Journal of Medicine. doi:10.15347/wjm/2014.008. ISSN 20018762.)

emergently transferred to a level I trauma center for further evaluation and management.

Computed tomography angiography revealed an abrupt loss of contrast at the distal axillary artery and a hematoma in the axillary pouch (Fig. 2). The patient underwent immediate vascular repair. There was an intimal rent with dissection in the artery leading to invagination of the separated intima. The damaged area of the artery was bridged with a basilic vein graft. The patient was discharged the following day and prescribed daily aspirin (325 mg).

Discussion

This event highlights the potential for injury to the brachial/axillary artery during OSPBT. Injury to the brachial plexus is well described. However, as this case highlights, the artery can also be injured should dissection be too medial. It is relatively easy to become disoriented through a small incision, particularly in a muscular person, and find oneself too medial, thereby placing the nerves and artery at risk. This may especially be the case in lateral decubitus. This is an extremely rare injury, but because biceps tenodeses are being more commonly done to address biceps disease as a component of rotator cuff disease and also as a primary and revision choice for superior labrum anteroposterior tears,

Figure 2 Computed tomography angiography reveals an abrupt loss of contrast at the distal axillary artery.

the surgeon and patient should be aware of the potential for neurovascular injury.

Arora et al[1] compared 4 different subpectoral biceps tenodesis constructs and reported an average ± standard deviation distance of 2.1 ± 2.0 mm from the bicortical button to the axillary nerve and 11 ± 2.5 mm to the radial nerve. In 6 specimens, the nerve was less than 3 mm away.