



Case Report

Ultrasound-guided axillary nerve block for ED incision and drainage of deltoid abscess☆



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ARTICLE INFO

Article history:

Received 16 December 2016

Accepted 28 January 2017

Keywords:

Pain management

Nerve block

Ultrasonography, emergency services, deltoid abscess

ABSTRACT

Deltoid abscesses are common and painful, often a consequence of injection drug use and seen frequently in emergency departments (EDs). The required incision and drainage can be completed successfully with effective pain relief using a peripheral nerve block. The brachial plexus nerve block works well, however it is technically complex with a low, but potentially serious, risk of complications such as phrenic nerve paralysis. Selective blockade of the axillary nerve eliminates the risks associated with a brachial plexus block, while providing more specific anesthesia for the deltoid region. Our initial experience suggests that the axillary nerve block (ANB) is a technically simple, safe, and effective way to manage the pain of deltoid abscesses and the necessary incision and drainage (I&D). The block involves using ultrasound guidance to inject a 20 mL bolus of local anesthetic into the quadrangular space surrounding the axillary nerve (inferior to the posterolateral aspect of the acromion, near the overlap of the long head of triceps brachii and teres minor). Once injected the local will anesthetize the axillary nerve resulting in analgesia of the cutaneous area of the lateral shoulder and the deeper tissues including the deltoid muscle.

Further research will clarify questions about the volume and concentration of local anesthetic, the role of injected adjuncts, and expected duration of analgesia and anesthesia. Herein we present a description of an axillary nerve block successfully used for deltoid abscess I&D in the ED.

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1. Introduction and anatomic basis of the axillary nerve block

The axillary nerve forms from the ventral rami roots of C5 and C6 (the terminal branch off the posterior cord of the brachial plexus). The axillary nerve lies posterior to the axillary artery and anterior to the subscapularis muscles, it travels to the border of the inferior edge of subscapularis and then courses through the quadrangular space and bifurcates into anterior and posterior branches. The quadrangular space is a pathway for the neuromuscular structures to move from the axilla to the posterior aspect of the arm; the boundaries are formed by subscapularis and teres minor (superior), teres major (inferior), the

surgical neck of the humerus (lateral), and long head of triceps brachii (medial).

The posterior branch of the axillary nerve provides motor innervation to teres minor and cutaneous innervation to the skin over the inferior aspect of the deltoid. The anterior branch wraps around the humerus, deep to the deltoid muscle and sends fibers into the muscle. The superior lateral cutaneous nerve of the arm also branches off at this point, supplying the shoulder joint tissues and most of the skin surrounding the deltoid muscles (Figs. 1a,b,c). The axillary nerve travels through the quadrangular space with the posterior circumflex humeral artery and can thus be well visualized on ultrasound with the typical honeycomb appearance.

The most convenient method to perform the axillary nerve block (ANB) is to have the patient laying prone, with the ultrasound probe in-line with the long axis of the humerus. The teres minor muscle can be seen tucked in from the medial side, underneath the large deltoid muscle like a “little thumb.” At the tip of the “thumb” the axillary nerve and circumflex artery can be visualized (Fig. 2). Carefully injecting local anesthetic will produce enough anesthesia of the cutaneous skin

☆ Funding sources/disclosures: none.

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over the deltoid to allow for incision and drainage of deltoid abscesses. This block is straightforward, has an improved safety profile compared to interscalene blocks, and is appropriate for emergency providers familiar with ultrasound-guided procedures.

2. Case

A 27-year-old female with a right deltoid abscess after injecting heroin 3 days prior.

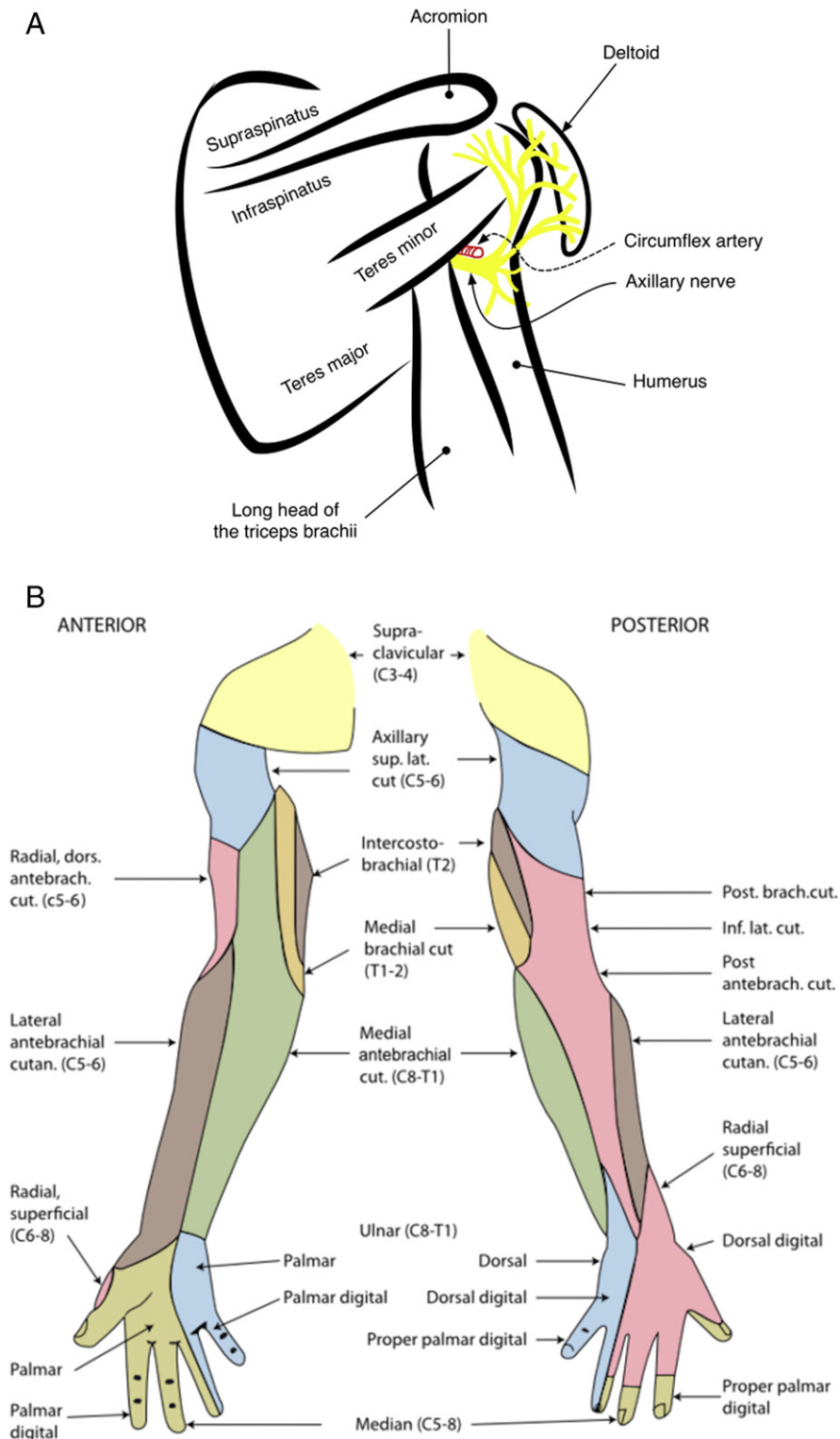


Fig. 1. Axillary nerve course and distribution. A. The axillary nerve originates from the posterior cord of the brachial plexus, carrying fibers from C5 and C6 and travels through the quadrangular space with the posterior circumflex humeral artery and vein. The anterior branch provides motor to the anterior deltoid as well as some cutaneous branches, while the posterior branch supplies teres minor, posterior deltoid motor, and supplies sensory to the skin of the lower 2/3 of the deltoid muscle and the skin covering the long head of triceps brachii. When the axillary nerve block (ANB) is performed, local anesthetic is deposited directly in contact with the axillary nerve, as it emerges inferior to teres minor. B. Upper extremity dermatome map. C. Cutaneous innervation of the upper extremity.

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