Case Report

Novel use of ultrasound in the ED: ultrasound-guided hematoma block of a proximal humeral fracture☆

Abstract

Proximal humeral fractures are a common injury after falls, particularly in the elderly population. An ultrasound-guided hematoma block is a novel technique for analgesia in cases when standard intravenous analgesia is not efficacious. We present a case in which ultrasound-guided hematoma block was the ideal method for adjunctive pain control in a patient with a comminuted humeral head fracture.

A 79-year-old female with history of coronary artery disease and chronic obstructive pulmonary disease presented to the emergency department (ED) complaining of right shoulder pain and swelling after a mechanical ground level fall. A nondislocated comminuted intraarticular proximal humerus fracture was noted on plain radiographs (Fig. 1).

Despite 4 intravenous (iv) doses of 0.5 mg/kg of morphine, high-dose oral acetaminophen, icing, and shoulder stabilization, the patient persisted to have moderate-to-severe pain. Because of the patient’s underlying fragile baseline cardiopulmonary function, an ultrasound-guided interscalene nerve block and/or repeated doses of iv opioid pain medications were felt unsafe. An ultrasound-guided hematoma block of the proximal humerus was considered the ideal option for symptomatic pain control.

The patient was placed upright and supine with a small towel behind her affected shoulder (to allow for access to the point of injection). Using a curvilinear transducer (10-5 MHz) in transverse orientation, the fracture segment with adjacent cortical hematoma could be clearly visualized just inferior to the glenohumeral joint (Fig. 2).

The area was prepared with chlorhexidine, and a skin wheal of 1% lidocaine was infiltrated to the overlying skin. Using an in-plane lateral-to-medial approach under real-time ultrasound guidance (Fig. 3A and B), a 22-g 3.5-in spinal needle was advanced to the fracture site while maintaining clear view of the ultrasound screen. After aspiration of a small amount of blood, 10 mL of 0.5% bupivicaine was injected (Fig. 3B). The patient’s pain scale was reassessed at 30 minutes and 1 hour and was reported at a 4/10 and 0/10, respectively. The patient did not require additional iv analgesia during her 12-hour ED stay.

Ultrasound-guided and blind hematoma blocks have been described in the literature and have been shown to provide safe and effective analgesia in multiple fracture locations, including the wrist, ankle, and sternum [1-6]. Although humeral fractures account for the third most common in adults more than age 65 years, accounting for up to 22 000 ED visits per year, there are no reports of hematoma blocks for this injury [7,8].

Standard iv opioid analgesia can be effective but also lead to oversedation, hypotension, and respiratory sedation (especially in patients with underlying respiratory dysfunction). In certain patients, adequate analgesia is often not possible with classic monomodal analgesic management [9].

Ultrasound-guided brachial plexus blocks at the level of the interscalene groove have been recently incorporated into the armamentarium of the emergency provider, offering an excellent method for analgesia to the patient with a painful injury to the proximal upper extremity [10,11]. Aside from the standard risks of peripheral nerve injury and local anesthetic systemic toxicity [12], interscalene brachial plexus nerve blocks often also inadvertently affect the phrenic nerve causing paralysis of the ipsilateral hemidiaphragm [13]. Although typically unnoticed in the healthy patient with pulmonary reserve, ipsilateral hemidiaphragmatic paralysis can be dangerous in the elderly patient and/or those with underlying pulmonary pathology [14].

We believe the ultrasound-guided hematoma block of the proximal humerus represents a novel and alternative adjunct to standard iv analgesia, particularly in the patients with known cardiopulmonary comorbidities.

Fig. 1. Anterior posterior portable radiograph demonstrating a nondisplaced humeral head fracture.

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