Correspondence

Ultrasound-guided ulnar nerve block for boxer fractures

Fifth metacarpal fracture (boxer fracture) is one of the most common traumatic complaints and is associated with significant pain. These fractures are most commonly treated with closed reduction and splinting without any pain intervention in our busy emergency department. To the best of our knowledge, our study is the first in English that screened the effectiveness of ultrasound-guided (USG) ulnar nerve block on closed reduction of fifth metacarpal fractures. Two patients were referred to the emergency department with left fifth metacarpal fractures due to fisting on the wall at different times while the performer of USG ulnar nerve block was on duty. They were asked to provide informed consent for participation in the study. After gaining written informed consent from the patients, an emergency physician (EP) experienced in bedside USG using the M7 model ultrasound machine with a 5- to 12-MHz high-frequency linear transducer (Mindray Bio-Medical Electronics Co, Shenzen, China) performed USG ulnar nerve block on closed reduction of fifth metacarpal fractures.

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With the patients maintaining a sitting position and holding their affected arm in a flexed position, the EP stood facing the lateral aspect of the affected arm. The ulnar nerve was located first on the ulnar aspect of the wrist while tightly closed together with the ulnar artery and followed proximally through the medial aspect of the ulnar bone. The ulnar nerve was seen clearly at approximately 10 cm above the wrist (Fig. 1). In this location are superficial and deep flexor muscles that facilitate the nerve’s identification. The area was prepared in a sterile fashion with a chlorhexidine solution. A sterile Tegaderm (3M, St Paul, MN) was placed over the ultrasound probe, and sterile surgical lubricant was spread on the intended injection side. The EP used the in-plane technique to instill an average of 2% lidocaine with an Exelint spinal needle (20G × 3½, 0.90 × 90 mm) around the ulnar nerve, beginning from above and then below the nerve in a circumferential manner under direct USG guidance (Figs. 1 and 2, Videos 1 and 2).

The patients reported no discomfort during the injection process. Thirty minutes after injection, the patients reported no pain but lost motor function in the fifth metacarpal. This temporary complication was reversed in both of the patients within 8 hours after the procedure. After confirmatory radiographs showed adequate reduction, the patients were placed in a spint and discharged. The visual analogue score of both patients before and during the reduction were noted. The visual analogue score was 9 for each patient before the procedure, but their scores were 1 and 2, respectively, during the reduction. In our 2 cases, we blocked the ulnar nerve only because the fifth metacarpal bone is innervated from the ulnar nerve. The patients were followed up 12 hours after USG nerve block and after 2 to 3 days in the orthopedic wards. There were no complications related to the regional block of the ulnar nerve.

Hematoma block has become the most commonly used form of anesthesia in upper-extremity fractures because it requires less equipment, is easy to use, and is relatively safe [1]. However, 1 case with infection due to hematoma block, 1 case with altered mental state due to a local anesthetic agent, and 1 case with a generalized seizure have been reported [12]. High serum levels of local anesthetic can cause complications [3,4]. Peripheral nerve blocks allow the patients and physicians to avoid these complications and provide excellent pain relief for several hours. In recent years, there has been a resurgence of distal peripheral nerve blocks to facilitate hand and wrist surgery [3]. Distal nerve blocks for the upper extremities may offer several benefits for patients compared with proximal nerve blocks. Distal approaches to upper-extremity blocks in general occur away from critical, more central structures, preserving the proximal muscle function of the upper limb. The inability to use the affected limb due to the motor block of proximal and distal musculature has been shown to reduce patient satisfaction [5]. A randomized controlled trial comparing USG-guided supraclavicular plexus block with distal peripheral nerve blocks for outpatient hand surgery showed better strength preservation and greater patient satisfaction with distal blocks [6]. Distal nerve blocks of the upper limb have been shown to hasten block onset times and improve block consistency [7,8].

The advent of ultrasonography has made performing upper-extremity nerve blocks relatively easier and has increased their efficacy [9]. The visual confirmation helps in accurately placing the drug, and because the nerves are visualized, less of the drug is required [10,11]. We have achieved excellent pain relief without any complications with USG ulnar nerve block. This new technique seems promising for the reduction of boxer fractures. Further randomized trials are needed in this area.

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.ajem.2016.06.045.

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* There are no conflicts of interest (including financial and other relationships).

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Please cite this article as: Ünlüer EE, et al, Ultrasound-guided ulnar nerve block for boxer fractures, Am J Emerg Med (2016), http://dx.doi.org/10.1016/j.ajem.2016.06.045

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http://dx.doi.org/10.1016/j.ajem.2016.06.045

References

Fig. 1. A, Radiograph of the first patient showing boxer fracture. B, Ultrasound-guided ulnar nerve block of the first patient.

Fig. 2. A, Radiograph of the second patient showing boxer fracture. B, Ultrasound-guided ulnar nerve block of the second patient.