Single- versus double-injection costoclavicular block: a randomized comparison

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Abstract

Background The costoclavicular approach targets the brachial plexus in the proximal infraclavicular fossa, where the lateral, medial, and posterior cords are tightly bundled together. This randomized trial compared single- and double-injection ultrasound-guided costoclavicular blocks. We selected onset time as the primary outcome and hypothesized that, compared with its single-injection counterpart, the double-injection technique would result in a swifter onset.

Methods Ninety patients undergoing upper limb surgery (at or below the elbow joint) were randomly allocated to receive a single- (n=45) or double-injection (n= 45) ultrasound-guided costoclavicular block. The local anesthetic agent (35 mL of lidocaine 1%-bupivacaine 0.25% with epinephrine 5 mu g/mL and 2 mg of preservative-free dexamethasone) was identical in all subjects. In the single-injection group, the entire volume of local anesthetic was injected between the three cords of the brachial plexus. In the double-injection group, the first half of the volume was administered in this location; the second half was deposited between the medial cord and the subclavian artery. After the performance of the block, a blinded observer recorded the onset time (defined as the time required to achieve a minimal sensorimotor composite score of 14 out of 16 points), success rate (surgical anesthesia) and block-related pain scores. Performance time and the number of needle passes were also recorded during the performance of the block. The total anesthesia-related time was defined as the sum of the performance and onset times.

Results Compared with its single-injection counterpart, the double-injection technique displayed shorter onset time (16.6 (6.4) vs 23.4 (6.9) min; p<0.001; 95% CI for difference 3.9 to 9.7) and total anesthesia-related time (22.5 (6.7) vs 28.9 (7.6) min; p<0.001). No intergroup

differences were found in terms of success and technical execution (ie, performance time/procedural pain). The double-injection group required more needle passes than the single-injection group (2 (1- 4) vs 1 (1-3); p<0.001).

Conclusion Compared with its single-injection counterpart, double-injection costoclavicular block results in shorter onset and total anesthesia-related times. Further investigation is required to determine if a triple-injection technique (with targeted local anesthetic injection around each cord of the brachial plexus) could further decrease the onset time.

Palabras clave

KeyWords Plus:GUIDED INFRACLAVICULAR BLOCK; ULTRASOUND

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