

ORIGINAL RESEARCH

Combine Supraclavicular- Interscalene vs Interscalene Block Under USG Guided in Patients Undergoing Humerus Shaft Fracture Surgery

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ABSTRACT

Background: The present study was conducted for evaluating the efficacy of combined supraclavicular- interscalene vs interscalene block under USG guided in patients undergoing Humerus shaft fracture surgery. **Materials & Methods:** A total of 50 patients with presence of humerus shaft fractures were enrolled and were randomly divided into two study groups as follows: Group 1: Interscalene + Supraclavicular block group, and Group 2: Interscalene block group. All the patients were scheduled for surgery. Block performance-related pain was evaluated using VAS (visual analogue scale) on a scale of 0 to 10 with 0 indicating no pain and 10 indicating severe excruciating pain. The extent of motor and sensory blockade was evaluated. The motor blockade was evaluated by rating the muscle contraction forces on a scale of 0 to 6. All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software. **Results:** Mean surgical time among the patients of group 1 and group 2 was 202.3 seconds and 191.7 seconds respectively. Non-significant results were obtained while comparing degree of sensory block in terms of VAS at C5, C5, C7 and C8 among the patients of the two study groups. While comparing the degree of motor block among the patients of the two study groups at median nerve and ulnar nerve, significant results were obtained. **Conclusion:** In order to achieve full postoperative pain coverage, brachial plexus blocks carried out under ultrasound guidance can be utilized in conjunction to safely limit the need for analgesia and anesthetic during surgery.

Key words: Supraclavicular- Interscalene, Interscalene Block, USG..

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INTRODUCTION

A direct blow commonly causes fractures that occur in the middle third of the shaft of the humerus. Humeral shaft fractures account for about 3% of all fractures. These fractures are classified based on their location, open or closed status and the type of fracture line. The majority of humeral shaft fractures are unstable but non-surgical treatment is the standard of care. Peak incidence occurs in males aged 21 to 30 and females aged 60 to 80, although a humerus fracture could happen in persons of any age or gender with the right mechanism of injury. Sixty percent of all humeral fractures occur in the middle-third of the humerus.¹⁻³ It is essential to obtain a detailed history from the patient including the mechanism of injury,

neurological symptoms, and any associated injuries. Fractures caused by low-energy trauma, such as fall from standing height, should raise the suspicion of poor bone quality associated with osteoporosis or oncologic disease. Past medical history is also required to help guide the management plan.⁴⁻⁶ The use of selective supraclavicular block, concurrently with a supraclavicular brachial plexus block, has been demonstrated to provide adequate anesthesia for clavicular surgery. However, it has been reported that the amount of local anesthetic used and the complication rate could be decreased by increasing the block success rate, utilizing ultrasonography (USG), which becomes more common in the practice of regional anesthesia.⁷ Hence; the present study was

conducted for evaluating the efficacy of combined supraclavicular- interscalene vs interscalene block under USG guided in patients undergoing Humerus shaft fracture surgery.

MATERIAL AND METHODS

The present study was conducted for evaluating the efficacy of combined supraclavicular- interscalene vs interscalene block under USG guided in patients undergoing Humerus shaft fracture surgery. A total of 50 patients with presence of humerus shaft fractures were enrolled and were randomly divided into two study groups as follows:

Group 1: Interscalene + Supraclavicular block group, and

Group 2: Interscalene block group

All the patients were scheduled for surgery. Demographic details of all the patients were recorded. Baseline hemodynamic and biochemical variables were recorded. Among both the study groups, block was performed with the use of ultrasound localization. Light sedation was done with Midazolam. After application of standard anaesthesia monitors, the blocks were performed with USG guided needle. The anaesthetic solution consisted of 0.5% Bupivacaine given in each group.

Block performance-related pain was evaluated using VAS (visual analogue scale) on a scale of 0 to 10 with 0 indicating no pain and 10 indicating severe excruciating pain. The extent of motor and sensory blockade was evaluated. The motor blockade was evaluated by rating the muscle contraction forces on a scale of 0 to 6 as follows:

- 6: normal muscle force;
- 5: slightly reduced muscle force;
- 4: greatly reduced muscle force;
- 3: slightly impaired mobility;
- 2: greatly impaired mobility;
- 1: near complete paralysis; and
- 0: complete paralysis³

All the results were recorded in Microsoft excel sheet followed by statistical analysis using SPSS software. Chi-square test and student t test were used for evaluation of level of significance.

RESULTS

A total of 50 patients were analyzed and were divided into two study groups with 25 patients in each group as follows: Group 1: Interscalene + Supraclavicular block group, and Group 2: Interscalene block group. Mean age of the patients of group 1 and group 2 was 49.2 years and 51.3 years respectively. There were 15 males and 10 females in group 1 while there were 14 males and 11 females in group 2. Mean BMI of the patients of group 1 and group 2 was 24.9 Kg/m² and 24.1 Kg/m² respectively. Mean surgical time among the patients of group 1 and group 2 was 202.3 seconds and 191.7 seconds respectively. Non-significant results were obtained while comparing degree of sensory block in terms of VAS at C5, C5, C7 and C8 among the patients of the two study groups. While comparing the degree of motor block among the patients of the two study groups at median nerve and ulnar nerve, significant results were obtained.

Table 1: Demographic data

| Variable | | Group 1 | Group 2 | p-value |
|-------------------------------|---------|---------|---------|---------|
| Mean age (years) | | 49.2 | 51.3 | 0.242 |
| Gender | Males | 15 | 14 | 0.758 |
| | Females | 10 | 11 | |
| Mean BMI (Kg/m ²) | | 24.9 | 24.1 | 0.339 |

Table 2: Comparison of degree of motor block

| Degree of sensory block | Group 1 | Group 2 | p-value |
|-------------------------|---------|---------|---------|
| Radial nerve | 0 | 0 | 1 |
| Median nerve | 0 | 1.8 | 0.001* |
| Ulnar nerve | 0 | 2.6 | 0.000* |

*: Significant

DISCUSSION

Fractures of the humerus shaft are relatively common, with an annual incidence rate varying from 12.0 and 23.4 fractures per 100,000 people and an increasing incidence with age. Most fractures of the humeral shaft can be managed conservatively. The indications for operative treatment include open fracture, pathological fracture, polytrauma, fracture with radial nerve or vascular injury, and failed non-surgical treatment leading to delayed or nonunion. Plate and

intramedullary nail (IMN) fixation are two traditional methods of fixation for the management of humeral shaft fractures. Open reduction and plate fixation (ORPF) allows direct visualization and anatomic reduction but also has potential disadvantages, such as radial nerve injury, and the risk of nonunion and deep infection resulting from extensive soft-tissue stripping.⁶⁻⁹

Several alternatives to ISB exist that are associated with a lower incidence of phrenic nerve paresis.

Supraclavicular block (SCB) decreases the risk of phrenic nerve involvement, particularly when guided by ultrasound, but nevertheless the associated level of phrenic nerve paresis is not negligible. This technique, which has been linked to a risk of pneumothorax when carried out by neurostimulation only, has now been revived and is included among the regional anaesthesia techniques considered to be well tolerated in terms of respiratory risk, especially when guided by ultrasound.¹⁰⁻¹² Hence; the present study was conducted for evaluating the efficacy of combined supraclavicular- interscalene vs interscalene block under USG guided in patients undergoing Humerus shaft fracture surgery.

A total of 50 patients were analyzed and were divided into two study groups with 25 patients in each group as follows: Group 1: Interscalene + Supraclavicular block group, and Group 2: Interscalene block group. Mean age of the patients of group 1 and group 2 was 49.2 years and 51.3 years respectively. There were 15 males and 10 females in group 1 while there were 14 males and 11 females in group 2. Mean BMI of the patients of group 1 and group 2 was 24.9 Kg/m² and 24.1 Kg/m² respectively. Mean surgical time among the patients of group 1 and group 2 was 202.3 seconds and 191.7 seconds respectively. Our results were in concordance with the results obtained by previous authors.

In the present study, non-significant results were obtained while comparing degree of sensory block in terms of VAS at C5, C5, C7 and C8 among the patients of the two study groups. While comparing the degree of motor block among the patients of the two study groups at median nerve and ulnar nerve, significant results were obtained. Ultrasound (US)-guided interscalene block (ISB) and small-volume supraclavicular block (SCB) for arthroscopic shoulder surgery were compared in a previous study by Aliste J et al. All patients received an US-guided intermediate cervical plexus block. In the ISB group, US-guided ISB was performed with 20 mL of levobupivacaine 0.5% and epinephrine 5 µg/mL. In the SCB group, US-guided SCB was carried out using 20 mL of the same local anesthetic agent: 3 and 17 mL were deposited at the "corner pocket" and posterolateral to the brachial plexus, respectively. A blinded investigator assessed ISBs and SCBs every 5 minutes until 30 minutes using a composite scale that encompassed the sensory function of the supraclavicular nerves, the sensorimotor function of the axillary nerve, and the motor function of the suprascapular nerve. Both groups displayed equivalent postoperative pain scores at 0.5, 1, 2, 3, 6, 12, and 24 hours. Interscalene blocks resulted in a higher incidence of HDP, a shorter onset time, and a higher proportion of patients with minimal composite scores of 6 points at 30 minutes.¹³

CONCLUSION

In order to achieve full postoperative pain coverage, brachial plexus blocks carried out under ultrasound guidance can be utilized in conjunction to safely limit the need for analgesia and anesthetic during surgery.

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