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Original Contribution

A comparison of suprascapular nerve block and procedural sedation analgesia in shoulder dislocation reduction ☆

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ABSTRACT

Objectives: Dislocation of the shoulder joint is one of the most common dislocations. The reduction procedure is a painful procedure. In this study, 2 different treatment groups were compared for pain control during shoulder dislocation reduction. It was aimed to evaluate the differences between the groups in reduction, success, length of hospital stay, complications, side effects, patient-physician satisfaction, and ease of application.

Methods: The study was planned to be prospective and randomized. As procedural sedation analgesia (SA), titration of ketamine 1 to 2 mg/kg was administered intravenously to group 1. Suprascapular nerve block (SNB) was applied under ultrasound guidance (USG) to group 2. Conformity to normal distribution of variables was examined with the Kolmogorov-Smirnov test. The χ^2 test and Fisher test were used to evaluate differences between the groups in categorical variables and the Mann-Whitney *U* test, and a value of $P < .05$ was accepted as statistically significant.

Results: The study comprised a total of 41 patients; 20 in the group 1 and 21 in the group 2. No statistically significant difference was determined between the groups in terms of age ($P = .916$), sex ($P = .972$), reduction success ($P = .540$), and patient-physician satisfaction ($P = .198$). The time spent in the emergency department (ED) by patients in the SA group was signficantly longer compared with the SNB group. No side effects were observed in the SNB group.

Conclusions: Suprascapular nerve block, which can be easily applied under USG in the ED, can be evaluated as a good alternative to SA in the reduction of shoulder dislocations.

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1. Introduction

The shoulder joint is one of the joints with the most movement and where dislocations are seen most frequently. Reduction, which is required in the treatment of shoulder dislocation in the early period, is a painful procedure [1]. Kazar and Relovsky [1] determined that shoulder dislocations comprise approximately 45% of all joint dislocations. Anterior dislocations comprise 95% to 97% of all these dislocations [2]. The reduction of a shoulder dislocation is a painful procedure. Various methods have been developed to remove or reduce the pain during reduction [3,4]. Procedural sedation analgesia (SA) suppresses the patient's consciousness, whereas continuing cardiopulmonary functions using sedative and dissociative agents together during a medical procedure to block or at least reduce the patient's response and remembrance of the event [5].

Procedural sedation and analgesia procedure can be performed in the emergency department (ED) by a physician experienced with the appropriate equipment and the management of complications, which may arise associated with the agents used. The other method is suprascapular nerve block (SNB) under ultrasonography. The suprascapular nerve, which is rooted from the superior branch of the brachial plexus (C5 and C6), provides sensory innervation to the glenohumeral joint and acromioclavicular joint. It also provides motor innervation to the supraspinatus and infraspinatus muscles [6].

Suprascapular nerve block was first described by Milowsky and Rovenstine [7] in 1941 and has been widely used by anethetists since then in various situations such as adhesive capsulitis and for pain control after shoulder arthroscopy. Harmon and Hearty [8] described it as a technique, which can be easily learned and can be applied by emergency physicians with the support of ultrasound. In this study, it was aimed to compare the effectiveness of procedural SA and SNB

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under ultrasound guidance (USG) on hospital stay and the success of reduction in shoulder dislocation, which is a very painful procedure.

2. Material and methods

This single-center, prospective, randomized, controlled, clinical study aimed to compare 2 different treatment groups to which procedural SA and SNB were applied in the ED during the reduction of shoulder dislocation. Approval for the study was granted by the local ethics committee.

2.1. Patient selection

The study comprised patients diagnosed with a shoulder dislocation as a result of examination in the ED. Informed consent was obtained from all the patients or their parents.

Exclusion criteria:

(1) Patients from whom informed consent could not be obtained
(2) Patients with systolic blood pressure less than 90 mm Hg or pulse less than 60 per minute
(3) Patients outside the American Society of Anesthesiology 1 to 2 criteria
(4) Patients who did not agree to participate in the study
(5) Patients with known chronic renal or liver failure
(6) Patients allergic to the medications to be used
(7) Patients younger than the age of 18 years
(8) Patients diagnosed with a fracture together with the dislocation

2.2. Study protocol

A simple randomization table was used to allocate patients to the groups. Numbers, starting from 1, were written on the previously completed patient consent forms and patient evaluation forms. For each patient who agreed to participate in the study, the protocol was applied by the physician responsible according to the number on the form. For each patient, the vital signs, oxygen saturation, blood pressure, and respiratory count were monitored from the time of the application of the medication until recovery.

The Steward Recovery Score was used for discharge criteria. Titration of ketamine was administered intravenously at a dosage of 1 to 2 mg/kg. The depth of sedation was evaluated using a 3-step sedation scale. When necessary, up to one-half to one-third of the initial dose was repeated. When sedation was achieved, the reduction procedure was applied.

For the SNB, the technique described in the study by Herring et al [9] was used. A 5 to 10 MHz linear probe of the USG device (M-Turbo; Sonosite, Inc., 21919, 30th Drive SE, Bothell, WA, USA) was placed parallel over the spina scapula (Fig.). The suprascapular nerve and artery were hyperechoically visualized in the scapular notch below the ligamentum transversum at a depth of 3 to 4 cm. Because of the doppler properties of USG, the artery and nerve were able to be differentiated from each other. The skin was entered 2 to 3 mm medially with the injector probe with a 22G needle with Priloc (PrilocR, 2% injection, 20 mL/400 mg prilocaine, VEM Pharmaceutical Inc., Istanbul, Turkey) solution and was advanced toward the scapular notch from medial to lateral. After passing the transverse ligament, 5 mL Priloc was injected. The success of the injection was confirmed with upward movement of the transverse ligament. After the injection, 5 to 10 minutes were waited, anesthesia was checked, then the reduction procedure was applied. In both groups, the modified Kocher method was used for reduction. In cases of unsuccessful reduction, the choice of second technique was left to the attending physician. Patient-physician satisfaction was evaluated by a 5-step classification (very good, good, satisfactory, poor, and very poor).

To determine the success of the procedure, changes in vital signs (oxygen saturation, arterial blood pressure, and pulse on arrival and at sedation 0, 5,10, 30, 60, 90, and 120 minutes), whether there was any need for oxygen or intubation, sedation depth, developing complications, or side effects (nausea, vomiting, hallucination, and agitation) were recorded through the recovery and discharge periods.

2.3. Data collection and statistical methods

All the data were transferred to computer, and statistical analysis was made using SPSS version 15.0 (SPSS, Chicago, IL). Conformity of variables to normal distribution was examined with the Kolmogorov-

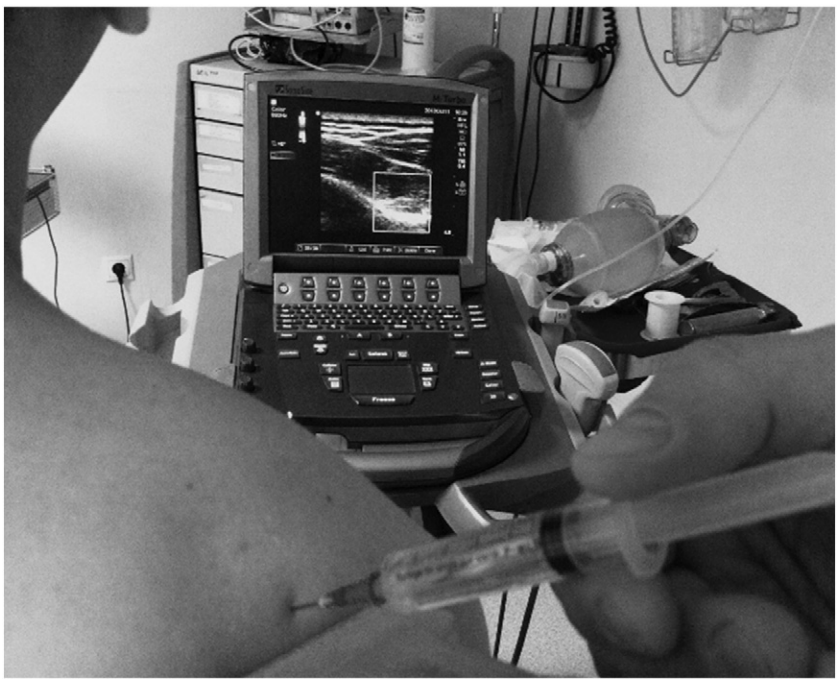

Fig. The figure showed that SNB with USG.

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