

Case Series

Analgesic Efficacy of Ultrasound Guided Interscalene Block in Shoulder Scopy Surgeries with 0.2% Ropivacaine with Dexmedetomidine- A Case Series

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ABSTRACT

Shoulder arthroscopy procedure has becoming popular both as a diagnostic and therapeutic tool in shoulder injuries. Interscalene block provides adequate analgesia as shoulder receives most of its nerve supply through suprascapular and axillary nerves. Our aim is to study the efficacy of ultrasound guided interscalene block in shoulder scopy surgeries in terms of duration of analgesia and opioid requirement in the first 24hrs postoperative period. After obtaining institutional ethics committee approval and written informed consent, We included 40 patients belonging to ASA PS1 and 2. All the patients were induced with propofol 1mg/kg, neuromuscular blockade with rocuronium 1mg/kg, analgesia with fentanyl 2µg/kg, intubated and maintained with oxygen, nitrous oxide and sevoflurane with MAC of 1.5. Then patient received ultrasound guided interscalene block using 15ml 0.2% ropivacaine with 10µg dexmedetomidine. Haemodynamic parameters were noted every 15min till the end of the procedure. Intravenous paracetamol 1g was given at the end of procedure. After extubating and shifting to postoperative period, analgesia was assessed using VAS score at 0hr, 6hr, 12hr, 24hr. Fentanyl 1µg/kg was given when the VAS score was more than 5 and the time to first analgesic request and the total dose given were noted. We found that mean duration of the analgesia was 715.9 ± 261.6 (mean \pm SD) minutes and the total analgesic requirement was not more than 2µg/kg fentanyl in the first 24hrs postoperative period. We concluded that ultrasound guided interscalene block with dexmedetomidine provides prolonged and effective analgesia in shoulder scopy surgeries without significant complications.

Keywords: Shoulder, Interscalene, Ropivacaine, Dexmedetomidine.

INTRODUCTION

Shoulder arthroscopy is one of the most widely used diagnostic and therapeutic, minimally invasive procedure for treating various shoulder pathologies [1]. Postoperative pain is a serious complication, which can cause shoulder dislocation when the patient moves vigorously due to pain. Apart from the discomfort experienced by the patients, severe postoperative pain can result in prolonged hospital stay. Hence adequate postoperative analgesia can result in rapid recovery, enabling less hospital stay and less hospital expenses [2], [3]. Shoulder scopy surgeries are usually done in either lateral or beach chair position. Beach chair position offers good visualisation and mobility of the shoulder joint. Regional anaesthesia can be given as the sole anaesthetic or in conjugation with general anaesthesia for shoulder scopy surgeries [4],[5]. Our institute, Balaji institute of Research and Rehabilitation of the Disabled (BIRRD) is an exclusive orthopaedic tertiary centre, with around 500-700 shoulder

surgeries done in our institute annually. In our institute, we generally use regional anaesthesia along with general anaesthesia, which keeps the patient comfortable in lateral or beach chair position. So, we decided to conduct this case series to know the analgesic efficacy of ultrasound guided interscalene block with 0.2% ropivacaine with 10 µg dexmedetomidine in shoulder scopy surgeries.

1. Shoulder Innervation:

Shoulder joint (glenohumeral joint) is a ball and socket type synovial joint, between scapula and humerus. It is innervated mainly by axillary (posterior cord of the brachial plexus), suprascapular nerve (upper trunk of the brachial plexus), with additional contribution from lateral pectoral nerve and subscapular nerves. Axillary nerve supplies anterior, lateral, inferior structures of shoulder joint, whereas suprascapular nerve supplies most of the posterior, medial, and superior part of the shoulder joint capsule. Hence blocking these nerves through interscalene approach

provides effective analgesia for the shoulder surgeries. Interscalene block is the gold standard technique for providing adequate analgesia for shoulder surgeries [6]. Ultrasound guided interscalene block helps in better visualisation of the nerve plexus, thereby reducing the total volume of local anaesthetic being injected and helps in avoiding inadvertent intraneural injection or causing phrenic nerve involvement, that can occur with blind anatomical approach. Many studies have confirmed that adding additives like dexmedetomidine (alpha 2 agonists), dexamethasone can prolong the duration of analgesia when added to the local anaesthetics in the blocks. So, this study was conducted to assess the efficacy of interscalene block using 0.2% ropivacaine with 10µg dexmedetomidine in ultrasound guided interscalene block. Our primary aim was to assess the duration of analgesia in terms of duration between the block and time of first analgesic request in the first 24hrs postoperative period. Our secondary aim was to calculate the total analgesic dose requirement in the first 24hrs and the patient's satisfaction score at 0,6,12,24 hrs.

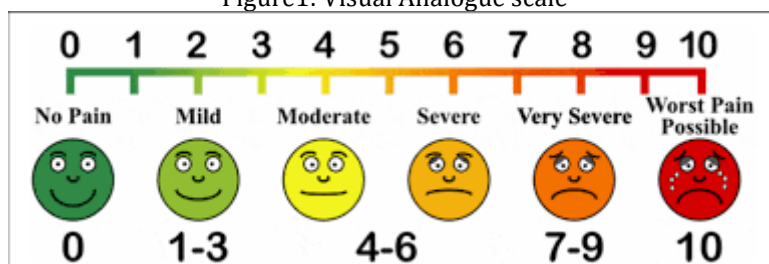
MATERIAL AND METHODS

After obtaining institutional ethics committee approval, we included 40 patients, both male and female, belonging to American Society of Anaesthesiologists Physical status [1],[2], posted for elective shoulder scopy surgeries in our hospital. Patients with mental illness, coagulopathy, chronic obstructive pulmonary diseases, myopathy and neuropathy were

excluded from the study. Written informed consent was obtained from all the patients. After shifting to the operation theatre, 18G intravenous cannula was secured, connected to monitors – 5 electrode Electrocardiogram, non-invasive blood pressure and saturation probe. All the patients were premedicated with midazolam 2mg iv, fentanyl 2 µg/kg iv. Preoxygenated with 100% oxygen, induced with propofol 2mg/kg iv, neuromuscular blockade with rocuronium 1mg/kg, maintained with oxygen + nitrous oxide + sevoflurane with MAC of 1.5. Then the patient in supine, head tilted to other side, neck is cleaned with betadine, under sterile aseptic precautions, patients received ultrasound guided interscalene block at C5,6,7 level was given using 15ml 0.2% ropivacaine with 10µg dexmedetomidine.

Haemodynamic parameters were monitored every 15 min till the end of procedure. After the procedure was finished, neuromuscular blockade was reversed with neostigmine and glycopyrrolate, patient's trachea was extubated and shifted to postoperative ICU. Pain was assessed using VAS visual analog scale at 0,6,12,24 hrs and fentanyl 1 µg/kg iv was given when the score was > 5. The total dose of fentanyl given in the first 24hrs postoperative was noted. Patient's satisfaction was assessed using Likert's satisfaction scale, from dissatisfied to extremely satisfied at 0,6,12, 24 hrs. patients were also observed for any motor block, hoarseness of the voice, dyspnoea in the postoperative period, which was then treated symptomatically, if present.

Figure1: Visual Analogue scale



Statistical analysis was done using SPSS software version 15. Demographic data were compared using student's t test and normal distribution values were presented as mean ± SD, patient's VAS score was presented with ANOVA test. *p* value <0.01 was considered statistically significant.

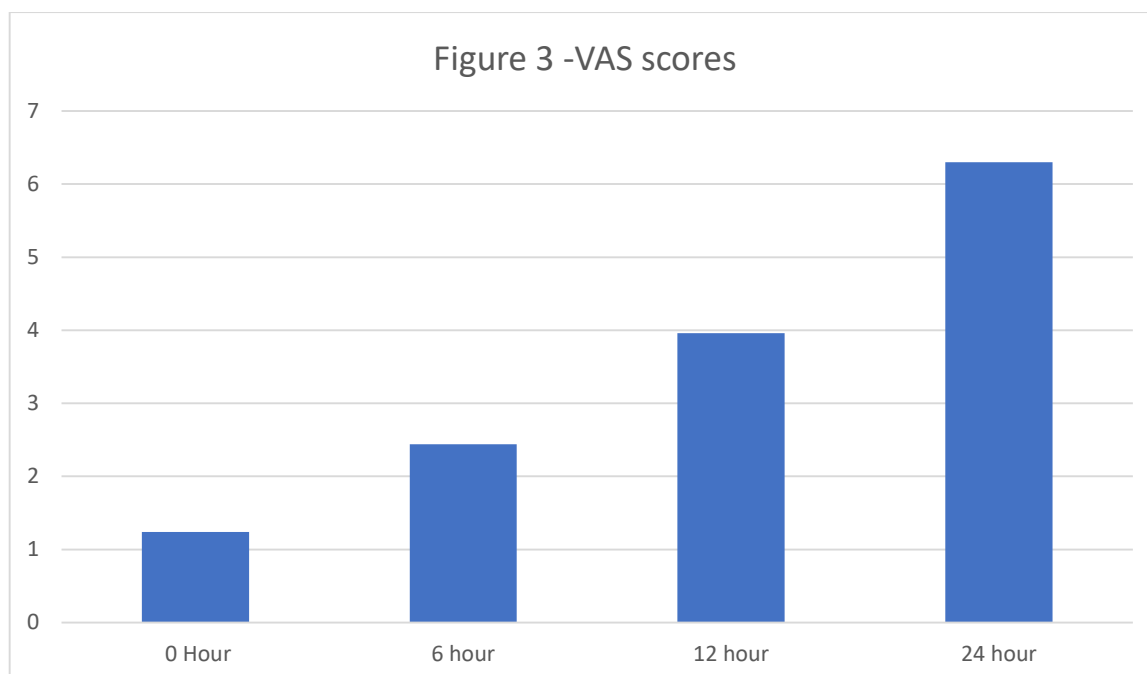
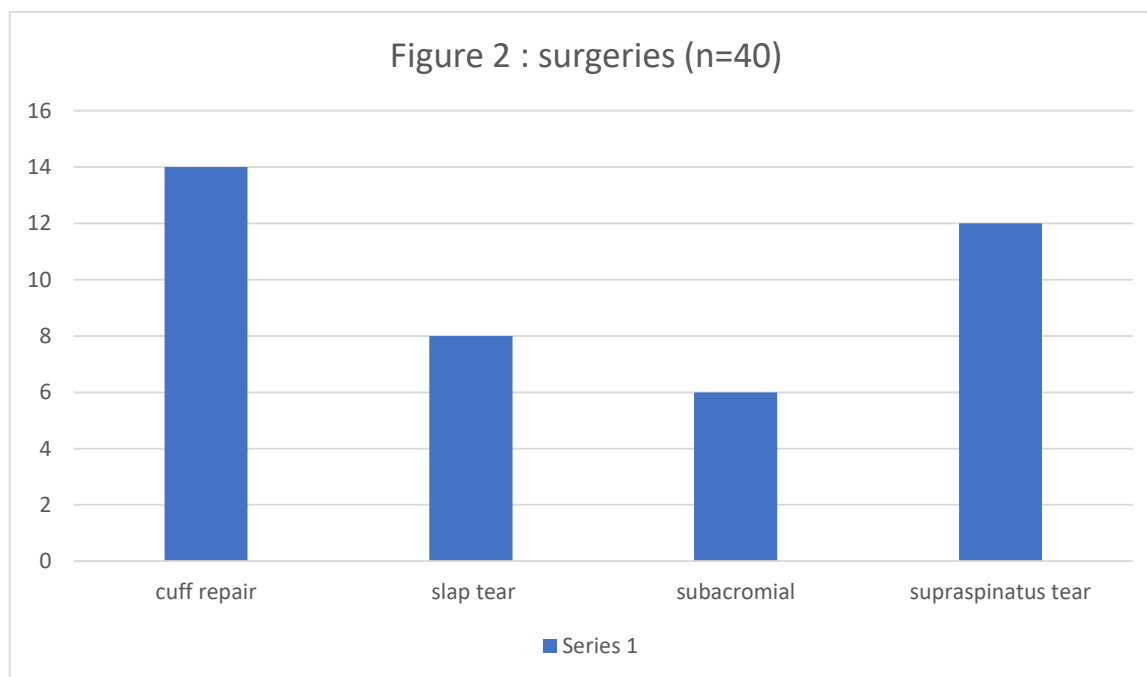
RESULTS:

Forty patients belonging to ASA PS 1, 2 were included in the study. Mean age was 37.9 ± 16.1(mean ± SD) years. Out of 40 patients, 22 were male and 18 were female. There were 14 cuff repairs, 8 SLAP tear repair, 12 supraspinatus tear repair, 6 subacromial decompression procedures were included in the study. Mean duration of analgesia was

defined as time between the block and time of request for first analgesic and it was 715.9 ± 261.6 (mean \pm SD) minutes. The total fentanyl consumption in the first 24hrs was 53.5 ± 17.86 μ g.

VAS score was less at 0 hour (1.24 ± 0.94), 6th hour (2.44 ± 0.94), 12th hour (3.96 ± 0.96)

and 24th hour (6.30 ± 0.97), which was statistically significant. Patient's satisfaction score was compared using Fischer exact test, with *p* value of <0.01 , which was statistically significant.



DISCUSSION:

Sensory innervation of shoulder joint is innervated by axillary and suprascapular nerves. These can be easily blocked through interscalene block [7],[8]. that is why

interscalene block remains the gold standard mode of analgesia for shoulder surgeries. Also, additives like dexmedetomidine, which is alpha 2 agonist helps in prolonging the sensory block. So, we decided to assess the efficacy of

ultrasound guided interscalene block using 0.2% ropivacaine with 10µg dexmedetomidine in shoulder scopy surgeries. Ultrasound helps in clear visualization of the anatomical structures, confides the deposition of local anesthetics to the particular area of concern, thereby helps in achieving effective analgesia with smaller volumes and helps in avoiding inadvertent intraneural injection of local anesthetic [9]. So, we used only 15 ml of local anesthetic for the block, which provided analgesia for a duration of 715.9 ± 261.6 minutes (mean \pm SD). Also lowering the concentration helps in avoiding motor block [10], we had used 0.25% ropivacaine and we observed that none of the patients had any motor block in the recovery period.

Nibedita *et al* compared the effectiveness of interscalene block and shoulder block (suprascapular and axillary nerve blocks) for shoulder surgeries and concluded that a shoulder block has been found to decrease pain levels and/or reduce the need for opioid medication following surgery and is as effective as interscalene block [11]. We found that patients had prolonged analgesia with interscalene block, with mean duration of 715 minutes (11.9 hours). Patient satisfaction score also was high with all the patients without any complications like motor block, dyspnea or hoarseness of voice. Since interscalene block with ropivacaine and dexmedetomidine provided effective analgesia in the immediate postoperative period with VAS score less than 5, we were able to manage with less opioid in the first 24 hrs postoperative period. Later pain was managed with oral analgesics and we were able to discharge them on the first postoperative day. Effective postoperative analgesia helped in reducing the hospital stay and patients were discharged with satisfaction [12], [13]. The patient satisfaction score was also statistically significant among our patients. Singdyn *et al* compared the continuous and patient controlled analgesia with interscalene block and reported Horner's syndrome and hoarseness of voice as complications [14]. We used single shot local anesthetic injection and did not observe any such complications in the postoperative period. Neuts *et al* published a clinical trial and concluded that suprascapular-axillary block provided effective analgesia like interscalene block, whereas we found that single shot anesthetic injection provided

effective analgesia for prolonged duration [15].

CONCLUSION:

Interscalene block with ropivacaine and dexmedetomidine provides prolonged and effective analgesia with lower incidence of complications in patients undergoing shoulder scopy surgeries.

Conflict of Interest - none

- Ethical approval - done
- Acknowledgement - none
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