

Our experience with serratus posterior superior intercostal plane block in postoperative analgesia of shoulder arthroscopy: a case report

 Emirhan Bугan*¹,  Seyyid Furkan Kına²

¹Department of Anesthesiology and Reanimation, Adana City Training and Research Hospital, Adana, Turkiye

²Department of Anesthesiology and Reanimation, Ankara Etlik City Hospital, Ankara, Turkiye

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*Corresponding Author: Emirhan Bугan, emirhanbugan73@gmail.com

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ABSTRACT

Postoperative pain management after shoulder arthroscopy is crucial for early mobilization and patient satisfaction. Although the interscalene brachial plexus block remains the gold standard for postoperative analgesia, it may be unsuitable in patients with pulmonary comorbidities due to its high incidence of hemidiaphragmatic paralysis. The serratus posterior superior intercostal plane (SPSIP) block is a newly described interfascial plane block that provides cervicothoracic analgesia while avoiding motor blockade. We present a case in which SPSIP block provided effective postoperative analgesia for shoulder arthroscopy in a patient with asthma and coronary artery disease.

Keywords: Shoulder arthroscopy, serratus posterior superior intercostal plane block, postoperative analgesia, regional anesthesia

INTRODUCTION

Shoulder arthroscopy is associated with significant postoperative pain, particularly within the first 24 hours. Effective postoperative analgesia facilitates early rehabilitation and reduces opioid requirements. Although the interscalene brachial plexus block is considered the gold standard for shoulder surgery, its use may be limited in patients with reduced pulmonary reserve due to hemidiaphragmatic paralysis secondary to phrenic nerve involvement.¹⁻²

In recent years, fascial plane blocks have gained attention due to their favorable safety profile and minimal motor involvement. The serratus posterior superior intercostal plane (SPSIP) block, first described by Tulgar et al.,³ is an interfascial block targeting the cervicothoracic junction. Cadaver studies have shown that dye spread extends from C4-T7, involving dorsal rami of upper thoracic nerves, correlating with C4-T6 dermatomal sensory distribution.

Beyond shoulder surgery, SPSIP block has demonstrated effective analgesia in various procedures including breast surgery, thoracic surgery (VATS), minimally invasive cardiac

surgery, clavicle surgery, posterior cervical/thoracic spinal procedures, and upper rib fractures.⁴⁻⁶

The purpose of this case report is to highlight the postoperative analgesic efficacy and clinical feasibility of SPSIP block as part of multimodal shoulder arthroscopy analgesia, particularly in a patient with pulmonary comorbidities where conventional regional techniques carry increased risk.

CASE

A 52-year-old female patient with a history of hypertension, coronary artery disease, and asthma was scheduled for elective shoulder arthroscopy. After cardiology and pulmonology evaluations, the patient was classified as ASA III.

Anesthesia Management

Standard ASA monitoring was applied. General anesthesia was induced using propofol 2 mg/kg, fentanyl 2 µg/kg, and rocuronium 0.6 mg/kg, followed by endotracheal intubation.

Maintenance consisted of sevoflurane in an oxygen–air mixture. Hemodynamics remained stable without additional intraoperative opioids. The patient was positioned in the beach-chair position for arthroscopy. Total surgical duration was 60 minutes.

SPSIP Block Technique

Approximately 30 minutes prior to induction, an ultrasound-guided SPSIP block was performed in the sitting position. A linear probe (6–13 MHz) was placed parasagittally over the second–third ribs. The trapezius, rhomboid major, and serratus posterior superior muscles were identified (**Figure 1**).

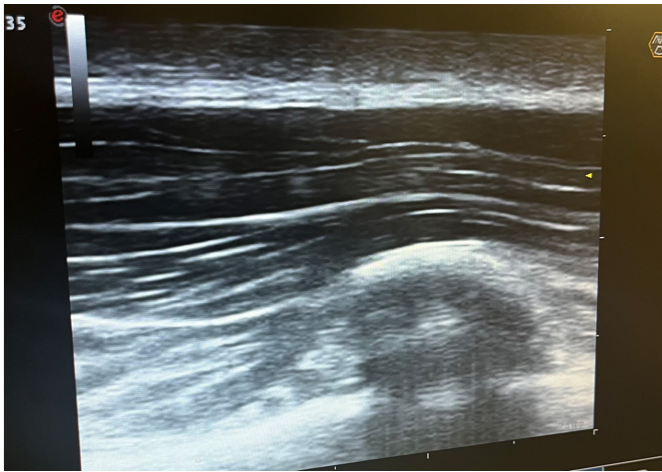


Figure 1. Ultrasound image of the serratus posterior superior intercostal plane (SPSIP) block—needle trajectory and target plane

A 22G, 100-mm needle was advanced in-plane into the fascial plane beneath the serratus posterior superior muscle. After hydrodissection, 20 ml of 0.25% bupivacaine was injected. Spread was visualized without complications (**Figure 2**).

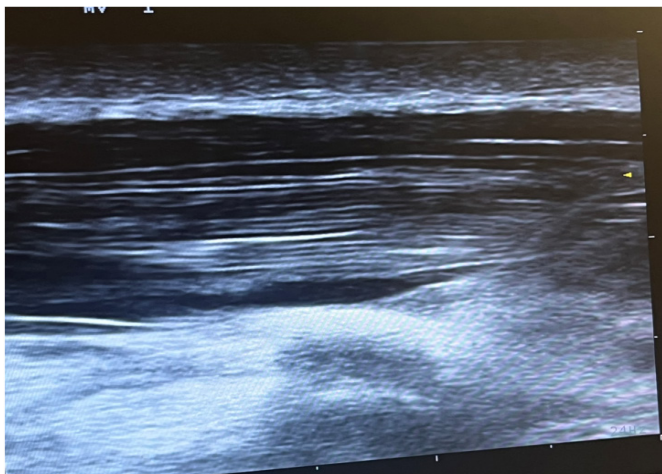


Figure 2. Distribution of local anesthetic in the SPSIP plane

Postoperative Course

At the 1st postoperative hour, the VAS score at rest was 3 with sensory involvement from C4–T6. At 8 hours, VAS remained 3. At 12 hours, the VAS score increased to 5, with regression to C5–T4. Only 1 g IV paracetamol was required every 8 hours; no rescue opioids were needed.

DISCUSSION

In this case, the interscalene block was avoided due to the patient's history of asthma, and the SPSIP block—a more superficial fascial plane block that does not cause motor blockade—was preferred. The SPSIP block is a newly described technique that aims to provide analgesia to the shoulder and upper thoracic regions by affecting the dorsal branches of the intercostal nerves and the cervicothoracic transition zone.³ Previous studies have reported that the SPSIP block provides effective analgesia in thoracic, breast, and shoulder surgeries.^{3,4}

Tulgar et al.³ demonstrated that the SPSIP block can achieve wide dermatomal spread in thoracoscopic and shoulder surgeries and may reduce opioid consumption. In our case, the postoperative sensory block extending from C4 to T6 supports the contribution of the SPSIP block to analgesia after shoulder arthroscopy.

Cadaveric studies have shown that SPSIP achieves wide dye spread from C4–T7, supporting its use for cervicothoracic analgesia.³ Clinical studies have demonstrated consistent dermatomal coverage from C3–T7, correlating with our patient's findings.

Interscalene block is the gold standard for shoulder surgery analgesia but results in hemidiaphragmatic paralysis in up to 70–100% of cases.^{1,2} This presents a significant risk for patients with asthma, COPD, or other pulmonary limitations. Alternative techniques such as suprascapular or axillary nerve blocks provide incomplete analgesia and often require combination.⁷

Thoracic interfascial plane blocks such as erector spinae plane and paravertebral blocks are effective but carry risks such as pneumothorax, vascular puncture, or epidural spread.^{8–10} The SPSIP block provides a more superficial and safer option, with minimal motor involvement and no impact on diaphragmatic function.

Recent prospective and randomized trials have confirmed the efficacy of SPSIP in diverse surgeries. A randomized controlled trial comparing SPSIP with thoracic paravertebral block in VATS demonstrated equivalent postoperative analgesia, similar opioid consumption, and comparable recovery outcomes.^{5–11} Additionally, interfascial plane block literature supports SPSIP's expanding role in multimodal postoperative analgesia.⁵

In our case, SPSIP provided effective analgesia with opioid-sparing benefits and no respiratory compromise—important advantages in patients with cardiopulmonary comorbidities.

CONCLUSION

The SPSIP block is a safe and effective option for postoperative analgesia in shoulder arthroscopy, especially for patients with limited pulmonary reserve. Its wide dermatomal spread, low complication profile, and opioid-sparing potential make it a valuable alternative to traditional regional techniques.

ETHICAL DECLARATIONS

Informed Consent

Written informed consent was obtained from the patient included in this report. Signed consent forms are retained by the authors and are available upon request.

Peer Review Process

This report underwent external peer review.

Conflict of Interest

The authors declare no conflicts of interest.

Financial Disclosure

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Author Contributions

Concept: E.B., S.F.K.; Desing: E.B.; Control: S.F.K.; Data Collection and/or Processing: E.B.; Literature Review: E.B., S.F.K.; Article Writing: E.B.; Critical Review: All authors.

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