Case Report

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Continuous Serratus Posterior Superior Intercostal Plane Block for Salvage Mastectomy: A Case Report and Current Literature

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Abstract

Serratus posterior superior intercostal plane block (SPSIPB) is a newly described truncal block. Here, we aim to share our experience with an SPSIPB catheter for pain management in a 71-year-old woman who underwent a salvage mastectomy and received a continuous infusion of 1 mg/mL bupivacaine solution at 5 mL/h for 48 hours. During follow-up, Numeric Rating Scale scores were ≤4, and Quality of Recovery-15 (QoR-15) scores improved at 48 h. Continuous SPSIPB is effective for postoperative pain management and for improving the QoR in patients undergoing breast surgery.

Keywords: Mastectomy, postoperative pain, catheterization, Quality of Recovery, serratus posterior superior intercostal plane block

Introduction

Effective pain management after breast cancer surgery is crucial, as poorly managed pain can significantly decrease a patient's quality of life (1). A new method for thoracic analgesia, the serratus posterior superior intercostal plane block (SPSIPB), targets the lateral cutaneous branches of the intercostal nerves and the dorsal rami. This is achieved by applying a local anesthetic to the area between the serratus posterior superior muscle and the intercostal muscles (2). We aim to share our experience using an SPSIPB catheter for pain management in a patient who underwent salvage mastectomy for end-stage breast cancer.

This case report follows the CAse REport guidelines. Written informed consent was obtained from the patient for publication of this report.

Case Report

A 71-year-old woman (weight 73 kg, height 163 cm) was admitted to the department of general surgery for surgical management of terminal breast cancer. Her medical history included two previous surgeries: one for cancer in her left breast 20 years earlier and another 4 years earlier to remove a mass from her right breast. After the second surgery, she discontinued her follow-up appointments.

At presentation, she had a foul-smelling, discharging mass in her right breast (Figure 1). Thoracic computed tomography revealed a malignant invasive tumor in the right breast with local necrosis and superimposed infection. The scan also demonstrated subcutaneous metastases, metastatic lymphadenopathy in the left axilla, and pulmonary and mediastinal metastases.

Her medical history also included hypertension and type 2 diabetes mellitus. Vital signs were within normal limits during the preoperative assessment. Cardiac evaluation revealed an ejection fraction of 55% with mild aortic and mitral regurgitation. Pulmonology consultation recommended avoiding fluid overload.

At hematology consultation, the patient had a hemoglobin level of 7.5 g/dL and was diagnosed with anemia of chronic disease. Administration of erythrocyte suspension during the perioperative period

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was recommended. Classified as an American Society of Anesthesiologists physical status classification III risk-group patient, she was scheduled for a salvage mastectomy under general anesthesia. Insertion of an SPSIPB catheter for pain management was also planned.

The patient was thoroughly informed about the block, and consent was obtained for its performance and for presentation of the case. The Numeric Rating Scale (NRS) and the Quality of Recovery-15 (QoR-15) scale were explained to the patient. Prior to surgery, routine monitoring was performed in the block room, where the preoperative QoR-15 measurement was obtained. The patient was premedicated with 1 mg midazolam.

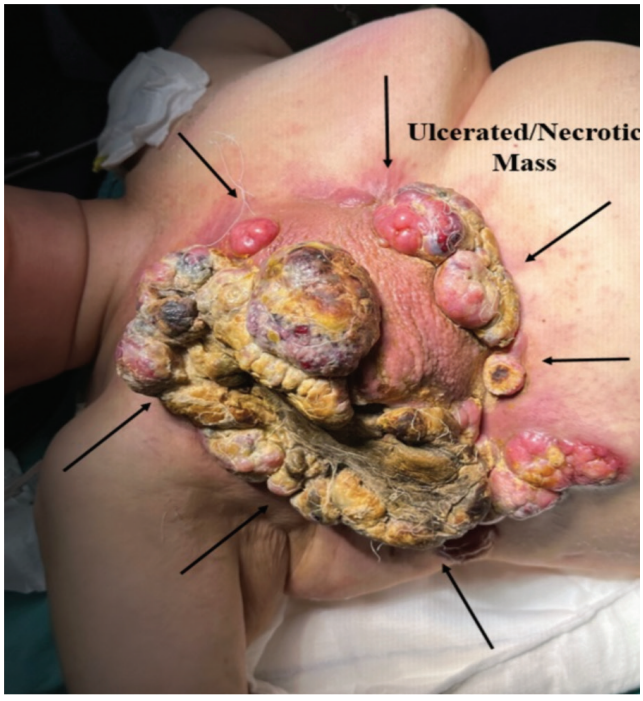

Figure 1. Preoperative appearance of the exophytic mass in the right breast. The arrows indicates the extensive necrotic and ulcerated tumor tissue

With the patient in the left lateral decubitus position, skin asepsis was ensured. A linear ultrasound probe (MyLab 30 Gold Cardiovascular, Esaote, Florence, Italy) was placed on the medial border of the right scapula at the level of the second and third ribs, ensuring appropriate field coverage (Figure 2A). An 18-G needle (Vygon Techniplex Tuohy 100-mm needle; Vygon, Paris, France) was advanced using an in-plane technique to the fascial plane between the third rib and the serratus posterior superior muscle after identification of the relevant anatomical landmarks (Figure 2B). After confirmation of correct placement with 5 mL of normal saline, the catheter was fixed at 6 cm, with 3.5 cm in-plane (Figure 2C). Subsequently, 20 mL of 0.25% bupivacaine was administered through the catheter.

The surgery lasted 125 min, and anesthesia duration was 145 min. A tumor mass weighing 1,270 g was excised, followed by breast reconstruction using a flap performed by the plastic surgery team. Postoperatively, the patient received 1 g acetaminophen and 70 mg tramadol [7 morphine milligram equivalents (MME)] before transfer to the recovery room. After 20 min, her resting NRS score was 0, and the dynamic NRS score decreased to 1. An infusion of 1 mg/mL bupivacaine was initiated at 5 mL/h via the catheter while the patient was in the recovery room. She was subsequently transferred to the postanesthesia care unit after achieving a modified Aldrete score of 9.

Postoperatively, the patient was prescribed 1 g paracetamol every 6 h. Tramadol at a dose of 0.5 mg/

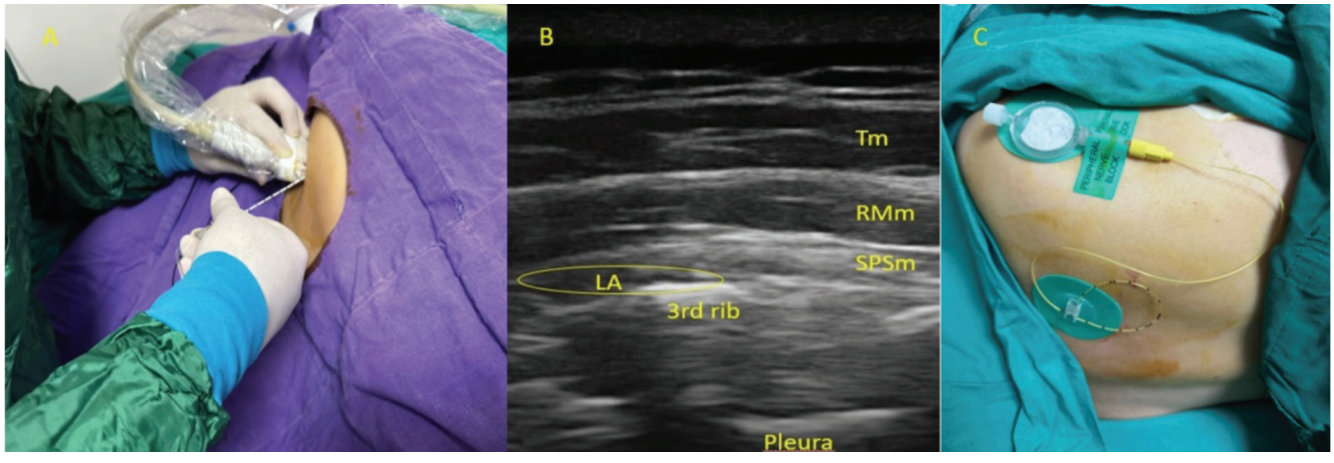

Figure 2. Placement of the SPSIPB catheter
(A) Patient position and probe placement, (B) ultrasound anatomy during the block, (C) the catheter fixed at the injection site

SPSIPB: Serratus posterior superior intercostal plane block, Tm: Trapezius muscle, RMm: Rhomboid major muscle, SPSm: Serratus posterior superior muscle, LA: Local anesthetic spread between the SPSm and the 3rd rib/intercostal muscle, Pleura: Pleural line

kg was administered if the dynamic NRS score was ≥4. Quality of Recovery-15 measurement were repeated at 24 and 48 h. The NRS scores at all other time points were ≤2, except at the 36th hour, when the dynamic NRS score reached 4 after administration of 30 mg tramadol (3 mg MME) (Table 1). The catheter was removed at 48 h. The patient's preoperative QoR-15 score was 112, which decreased slightly to 108 at 24 h and then increased to 129 at 48 h.

Discussion

The SPSIPB is a novel interfascial plane block targeting the thoracic intercostal nerves. In this case report, we demonstrated that a continuous SPSIPB catheter provided effective analgesia and reduced opioid consumption in a patient undergoing salvage mastectomy for end-stage breast cancer.

Thoracic paravertebral block (TPVB) is often considered the gold standard for analgesia in breast surgery; however, it carries risks such as pneumothorax, sympathectomy-related hypotension, and epidural spread. Compared with TPVB, SPSIPB is performed more superficially and laterally to the transverse process, potentially offering a superior safety profile while effectively targeting the lateral cutaneous branches of the intercostal nerves. Unlike the erector spinae plane block, which relies on diffusion of local anesthetic through the costotransverse foramen into the paravertebral space, SPSIPB delivers anesthetic directly into the intercostal plane (2,3). This direct application may provide more consistent lateral chest wall analgesia, which is crucial in extensive surgeries such as salvage mastectomy involving the axillary region.

Akin et al. (4) described the use of a continuous SPSIPB catheter for postoperative analgesia in a patient undergoing minimally invasive cardiac surgery. They reported excellent pain control and a high QoR score without opioid consumption. Although their report focused on cardiac surgery, our case extends the indication of continuous SPSIPB to major breast surgery, suggesting that this technique is a versatile and feasible option for prolonged analgesia in thoracic procedures involving the lateral chest wall.

Dada et al. (5) described rebound pain as increased pain sensitivity occurring 8-24 h after block application, most commonly 8-12 h after a single nerve block injection, which can adversely affect patient well-being and QoR (6). In our practice, non-steroidal anti-inflammatory drugs are avoided during the first 48 h after surgery because of potential negative effects on wound healing. Therefore, we prefer catheter-based postoperative analgesia to prevent rebound pain and minimize opioid use.

In this patient, extensive tissue excision and axillary dissection posed a high risk of severe postoperative pain. Continuous infusion through the SPSIPB catheter maintained NRS scores largely below 4/10. Although minor breakthrough pain occurred at the 36th hour, requiring a small rescue dose, QoR-15 scores improved significantly from 108 to 129, particularly in the pain and sleep domains. These findings suggest that continuous SPSIPB not only reduces pain intensity but also supports functional recovery.

This report includes only a single case, and future case series or controlled trials are required to further evaluate the effectiveness and safety of continuous SPSIPB catheters in this patient population.

Conclusion

The continuous SPSIPB catheter provided effective analgesia and minimized opioid consumption in this salvage mastectomy case. The technique supported high-quality recovery without severe pain episodes during the catheterization period.

Table 1. Postoperative clinical data

	20th min	1st h	2nd h	6th h	12th h	24th h	36th h	48th h
Resting NRS	0	0	0	0	0	1	2	0
Dynamic NRS	1	1	1	1	1	2	4	1
Ramsey Sedation Scale score	2	2	2	2	2	1	1	1
Additional analgesic	None	None	None	1 g acetaminophen	1 g acetaminophen	1 g acetaminophen	1 g acetaminophen +30 mg tramadol	1 g acetaminophen

NRS: Numeric Rating Scale

Ethics

Informed Consent: Written informed consent was obtained from the patient for publication of this report.

Footnotes

Authorship Contributions

Surgical and Medical Practices: C.B., B.G.K., Concept: C.B., B.G.K., Design: C.B., B.G.K., Data Collection or Processing: C.B., B.G.K., Analysis or Interpretation: C.B., B.G.K., Literature Search: C.B., Writing: C.B., B.G.K.

Conflict of interests: All authors declare no conflicts of interest.

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