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Original Research Article

Postoperative Analgesia with Erector Spinae Plane Block versus Serratus Anterior Plane Block in Patients Undergoing Modified Radical Mastectomy under Thoracic Segmental Spinal Anaesthesia: A Prospective Observational Study

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Abstract

Background: Modified radical mastectomy is commonly associated with significant postoperative pain, which may adversely affect recovery and patient satisfaction. Ultrasound-guided fascial plane blocks such as Erector Spinae Plane Block (ESPB) and Serratus Anterior Plane Block (SAPB) have emerged as effective regional analgesic techniques for breast surgery.

Aim: To compare the postoperative analgesic efficacy of ESPB and SAPB in patients undergoing modified radical mastectomy under thoracic segmental spinal anaesthesia.

Materials and Methods: This prospective observational study was conducted in the Department of Anaesthesiology and Critical Care, VIMSAR, Burla, Odisha. A total of 88 female patients aged 20–60 years, belonging to ASA physical status I and II, were enrolled and divided into two groups: ESPB (n=44) and SAPB (n=44). Postoperative analgesic outcomes, pain scores, rescue analgesic requirements, recovery parameters, hemodynamic variables, and adverse effects were recorded and analyzed.

Results: The mean duration of analgesia was significantly longer in the ESPB group than in the SAPB group (10.8 ± 2.4 vs. 7.2 ± 2.1 hours; $p<0.001$). Time to first rescue analgesia was also prolonged in the ESPB group (10.8 ± 2.4 vs. 7.2 ± 2.1 hours; $p<0.001$). Patients receiving ESPB required fewer rescue analgesic doses and lower tramadol consumption (78 ± 35 mg vs. 122 ± 40 mg; $p<0.001$). VAS pain scores were significantly lower at all postoperative intervals from 2 to 24 hours. ESPB facilitated earlier ambulation and bladder evacuation and was associated with a lower incidence of postoperative nausea and vomiting (15.9% vs. 34.1%; $p=0.045$).

Conclusion: ESPB provided superior postoperative analgesia, reduced analgesic requirements, improved recovery outcomes, and decreased postoperative adverse effects compared with SAPB. It may be considered the preferred regional analgesic technique for modified radical mastectomy under thoracic segmental spinal anaesthesia.

Keywords: Erector Spinae Plane Block, Serratus Anterior Plane Block, Modified Radical Mastectomy, Thoracic Segmental Spinal Anaesthesia, Postoperative Analgesia, Breast Surgery, and Regional Anaesthesia.
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Introduction

Breast cancer remains the most frequently diagnosed malignancy among women worldwide and is a leading cause of cancer-related mortality. Advances in screening programs, surgical techniques, and adjuvant therapies have significantly improved survival rates; however, effective perioperative pain management continues to be a major concern in patients undergoing breast cancer surgery. Modified radical mastectomy (MRM) is one of the most commonly performed surgical procedures for the treatment of breast carcinoma and is often associated with moderate to

severe postoperative pain resulting from extensive tissue dissection, axillary lymph node clearance, and injury to intercostal nerves [1,2]. Inadequately controlled acute postoperative pain may impair early recovery, delay mobilization, increase hospital stay, and contribute to the development of chronic post-mastectomy pain syndrome, thereby adversely affecting quality of life [3].

Multimodal analgesia has become the cornerstone of postoperative pain management in breast surgery. Traditionally, systemic opioids have been widely used; however, their use is frequently associated with adverse effects such as nausea, vomiting, sedation, respiratory depression, and delayed recovery [4]. Consequently, regional anaesthetic techniques have gained increasing popularity as they provide targeted analgesia, reduce opioid consumption, and improve patient satisfaction [5]. Among the available regional techniques, ultrasound-guided fascial plane blocks have emerged as effective and relatively safe alternatives due to their simplicity, reliability, and favorable risk profile.

The Erector Spinae Plane Block (ESPB), first described by Forero et al., involves the deposition of local anaesthetic deep to the erector spinae muscle adjacent to the transverse process. The injected solution spreads cranio-caudally and may reach the dorsal and ventral rami of spinal nerves, thereby providing extensive thoracic analgesia [6]. Several studies have demonstrated the effectiveness of ESPB in thoracic, breast, and upper abdominal surgeries, with reports of prolonged analgesia and reduced postoperative opioid requirements [7]. Its ease of administration and low risk of complications have contributed to its growing acceptance in clinical practice.

The Serratus Anterior Plane Block (SAPB), introduced by Blanco et al., is another ultrasound-guided regional anaesthetic technique specifically designed to provide analgesia to the anterolateral thoracic wall.

By depositing local anaesthetic between the serratus anterior muscle and surrounding fascial planes, SAPB effectively blocks the lateral cutaneous branches of the intercostal nerves and has shown promising results in breast surgery [8]. The technique is relatively simple to perform and has been associated with reduced postoperative pain scores and decreased analgesic requirements.

Thoracic segmental spinal anaesthesia has recently emerged as a feasible alternative to general anaesthesia for selected breast surgeries, offering excellent intraoperative anaesthesia, hemodynamic stability, and enhanced postoperative recovery [9]. However, despite the increasing use of ESPB and SAPB as adjuncts to thoracic spinal anaesthesia, evidence comparing their relative efficacy in patients undergoing modified radical mastectomy remains limited and inconclusive. Therefore, the present study was undertaken to compare the postoperative analgesic efficacy of Erector Spinae Plane Block and Serratus Anterior Plane Block in patients undergoing modified radical mastectomy under thoracic segmental spinal anaesthesia. The study aimed to evaluate differences in duration and quality of analgesia, rescue analgesic requirements, pain scores, recovery characteristics, and postoperative adverse effects between the two techniques, thereby identifying the more effective regional analgesic strategy for this patient population [10].

The primary objective of this study was to compare the duration and quality of postoperative analgesia provided by Erector Spinae Plane (ESP) block and Serratus Anterior Plane (SAP) block in patients undergoing modified radical mastectomy under thoracic segmental spinal anaesthesia. The secondary objectives were to evaluate and compare the time to first request for rescue analgesia, total postoperative analgesic consumption during the first 24 hours, postoperative pain scores at predefined intervals using the Visual Analogue Scale (VAS), time to ambulation, time to unassisted bladder evacuation, and the incidence of postoperative adverse effects, particularly postoperative nausea and vomiting (PONV), between the two study groups. Additionally, the overall effectiveness and safety of both regional analgesic techniques were assessed in the postoperative period.

Materials and Methods

Study Design: Prospective observational study.

Study Population: Female patients undergoing elective modified radical mastectomy under thoracic segmental spinal anaesthesia and receiving postoperative analgesia with either Erector Spinae Plane (ESP) block or Serratus Anterior Plane (SAP) block.

Sample Size: A total of 88 patients were enrolled in the study, with 44 patients in each group (ESP block group and SAP block group). The sample size was calculated based on a previous study considering a significance level of 5%, power of 80%, and a 10% dropout rate.

Study Duration: Two years.

Study Place: Department of Anaesthesiology and Critical Care, Veer Surendra Sai Institute of Medical Sciences and Research (VIMSAR), Burla, Sambalpur, Odisha, India.

Inclusion Criteria:

- Female patients aged 20–60 years.

- American Society of Anesthesiologists (ASA) physical status I and II.
- Patients scheduled for elective modified radical mastectomy.
- Patients receiving thoracic segmental spinal anaesthesia.
- Patients willing to provide written informed consent.

Exclusion Criteria:

- Refusal to participate in the study.
- Known allergy or hypersensitivity to local anaesthetic drugs.
- History of substance abuse or psychiatric illness.
- Presence of coagulation disorders.
- Infection at the site of block administration.
- Requirement for conversion of anaesthetic technique to general anaesthesia.
- Incomplete data collection or protocol violation during the study period.

Statistical Analysis: We put the data into Microsoft Excel and then used SPSS software version 27.0 (SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5 to look at it. Mean ± standard deviation was used to show continuous variables, and frequencies and percentages were used to show categorical variables.

The unpaired t-test was utilized to examine continuous variables between independent groups, whereas the paired t-test was employed for comparisons within the same group.

The Chi-square test or Fisher's exact test was used to look at categorical variables, depending on which one was better. A p-value of less than 0.05 was seen to be statistically important.

Result

Table 1: Baseline Demographic and Clinical Characteristics of Study Participants

Variable	Group E (ESPB) (n=44)	Group S (SAPB) (n=44)	p-value
Age (years), Mean ± SD	47.1 ± 8.2	46.3 ± 9.0	0.62
Body Mass Index (kg/m²), Mean ± SD	24.8 ± 3.1	25.2 ± 3.3	0.55
ASA Physical Status I, n (%)	26 (59.1)	24 (54.5)	0.68
ASA Physical Status II, n (%)	18 (40.9)	20 (45.5)	0.68
Duration of Surgery (minutes), Mean ± SD	112.4 ± 18.1	115.1 ± 19.6	0.45

Table 2: Comparison of Postoperative Analgesic Outcomes

Parameter	Group E (ESPB)	Group S (SAPB)	p-value
Duration of Analgesia (hours), Mean ± SD	10.8 ± 2.4	7.2 ± 2.1	<0.001
Time to First Rescue Analgesia (hours), Mean ± SD	10.8 ± 2.4	7.2 ± 2.1	<0.001
Median Time to Rescue Analgesia (IQR), hours	11.0 (9.5–12.5)	7.0 (6.0–8.5)	<0.001
Patients Requiring Rescue Analgesia, n (%)	38 (86.4)	43 (97.7)	0.05
Mean Number of Rescue Analgesic Doses	1.3 ± 0.7	2.1 ± 0.8	<0.001
Patients Requiring Second-Line Analgesia (Diclofenac), n (%)	6 (13.6)	14 (31.8)	0.04

Table 3: Postoperative Analgesic Consumption and Recovery Profile

Parameter	Group E (ESPB)	Group S (SAPB)	p-value
Total Tramadol Consumption (mg), Mean ± SD	78 ± 35	122 ± 40	<0.001
Total Diclofenac Consumption (mg), Mean ± SD	10.2 ± 27.5	24.0 ± 40.0	0.04
Time to Ambulation (hours), Mean ± SD	6.2 ± 1.8	9.5 ± 2.4	<0.001
Time to Unassisted Bladder Evacuation (hours), Mean ± SD	7.1 ± 1.9	10.2 ± 2.5	<0.001

Table 4: Comparison of Postoperative VAS Scores

Time Interval	Group E (ESPB) Mean ± SD	Group S (SAPB) Mean ± SD	p-value
0 hour	1.0 ± 0.7	1.1 ± 0.8	0.52
2 hours	1.3 ± 0.8	2.0 ± 0.9	<0.001
4 hours	2.0 ± 0.9	3.0 ± 1.0	<0.001
6 hours	2.8 ± 1.0	3.8 ± 1.1	<0.001
12 hours	3.2 ± 1.1	4.2 ± 1.2	<0.001
24 hours	3.0 ± 1.0	3.8 ± 1.1	0.001

Table 5: Comparison of Postoperative Hemodynamic Parameters

Time	SBP (ESPB)	SBP (SAPB)	p-value	HR (ESPB)	HR (SAPB)	p-value
0 h	119.93 ± 7.93	123.95 ± 9.03	0.029	80.00 ± 7.02	85.20 ± 7.29	0.001
2 h	118.02 ± 7.08	122.07 ± 8.05	0.014	77.95 ± 6.01	83.05 ± 7.00	<0.001
4 h	116.02 ± 7.00	120.98 ± 7.97	0.003	75.98 ± 5.97	81.98 ± 7.01	<0.001
6 h	115.00 ± 6.02	119.98 ± 6.97	0.001	74.98 ± 4.97	81.11 ± 6.02	<0.001
12 h	114.00 ± 5.98	117.98 ± 7.02	0.005	73.95 ± 5.01	78.93 ± 5.92	<0.001
24 h	116.00 ± 5.99	118.95 ± 7.03	0.037	72.95 ± 4.98	78.00 ± 6.01	<0.001

Table 6: Postoperative Adverse Effects and Overall Outcome Summary

Parameter	Group E (ESPB) (n=44)	Group S (SAPB) (n=44)	p-value
Postoperative Nausea, n (%)	6 (13.6)	13 (29.5)	0.07
Postoperative Vomiting, n (%)	2 (4.5)	6 (13.6)	0.14
Overall PONV, n (%)	7 (15.9)	15 (34.1)	0.045
Hypotension, n (%)	3 (6.8)	4 (9.1)	0.69
Bradycardia, n (%)	1 (2.3)	2 (4.5)	0.56
Block-related Complications, n (%)	0 (0)	0 (0)	—

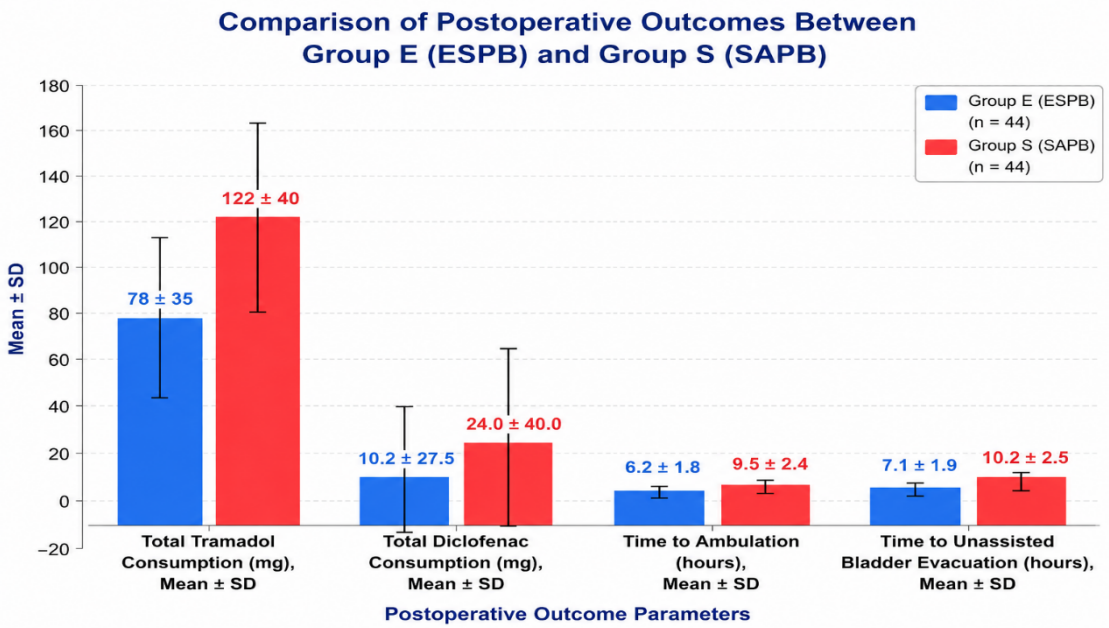

Figure: 1: Postoperative Analgesic Consumption and Recovery Profile

A total of 88 patients were included in the study, with 44 patients allocated to the Erector Spinae Plane Block (ESPB) group and 44 patients to the Serratus Anterior Plane Block (SAPB) group. The mean age of patients in the ESPB group was 47.1 ± 8.2 years, while that in the SAPB group was 46.3 ± 9.0 years, showing no statistically significant difference ($p = 0.62$). Similarly, the mean body mass index (BMI) was comparable between the groups, being 24.8 ± 3.1 kg/m² in the ESPB group and 25.2 ± 3.3 kg/m² in the SAPB group ($p = 0.55$). With regard to physical status, 26 patients (59.1%) in the ESPB group and 24 patients (54.5%) in the SAPB group belonged to ASA Class I, whereas ASA Class II patients constituted 18 (40.9%) and 20 (45.5%) patients, respectively ($p = 0.68$). The mean duration of surgery was 112.4 ± 18.1 minutes in the ESPB group and 115.1 ± 19.6 minutes in the SAPB group, with no significant difference observed ($p = 0.45$). These findings indicate that both groups were well matched in terms of demographic and perioperative characteristics, ensuring comparability of postoperative outcomes. The ESPB group demonstrated significantly superior postoperative analgesic outcomes compared to the SAPB group. The mean duration of postoperative analgesia was 10.8 ± 2.4 hours in the ESPB group, which was significantly longer than 7.2 ± 2.1 hours observed in the SAPB group ($p < 0.001$). Likewise, the mean time to first rescue analgesia was significantly prolonged in the ESPB group (10.8 ± 2.4 hours) compared with the SAPB group (7.2 ± 2.1 hours) ($p < 0.001$). Analysis of median values also demonstrated a significantly longer pain-free interval in the ESPB group, with a median time of 11.0 hours (IQR 9.5–12.5) versus 7.0 hours (IQR 6.0–8.5) in the SAPB group ($p < 0.001$). Rescue analgesia within the first 24

postoperative hours was required in 38 patients (86.4%) in the ESPB group and 43 patients (97.7%) in the SAPB group ($p = 0.05$). Furthermore, the mean number of rescue analgesic doses was significantly lower in the ESPB group (1.3 ± 0.7) than in the SAPB group (2.1 ± 0.8) ($p < 0.001$). The requirement for second-line analgesia with diclofenac was also significantly reduced among ESPB recipients (13.6%) compared with SAPB recipients (31.8%) ($p = 0.04$). These findings clearly indicate that ESPB provided more prolonged and effective postoperative analgesia.

Patients in the ESPB group required significantly less postoperative analgesic medication during the first 24 hours after surgery. The mean tramadol consumption was 78 ± 35 mg in the ESPB group compared with 122 ± 40 mg in the SAPB group, representing a statistically significant reduction ($p < 0.001$). Similarly, total diclofenac consumption was significantly lower in the ESPB group (10.2 ± 27.5 mg) than in the SAPB group (24.0 ± 40.0 mg) ($p = 0.04$). Postoperative recovery was also faster among patients receiving ESPB.

The mean time to ambulation was 6.2 ± 1.8 hours in the ESPB group, significantly shorter than 9.5 ± 2.4 hours in the SAPB group ($p < 0.001$). Likewise, the mean time to unassisted bladder evacuation was 7.1 ± 1.9 hours in the ESPB group compared with 10.2 ± 2.5 hours in the SAPB group ($p < 0.001$). These findings suggest that superior pain control achieved with ESPB facilitated earlier mobilization and recovery. Postoperative pain intensity assessed using the Visual Analogue Scale (VAS) was significantly lower in the ESPB group at most postoperative time intervals.

At 0 hour, the mean VAS score was 1.0 ± 0.7 in the ESPB group and 1.1 ± 0.8 in the SAPB group, with no significant difference ($p = 0.52$). However, from 2 hours onwards, pain scores were consistently lower among patients receiving ESPB. At 2 hours, the mean VAS score was 1.3 ± 0.8 in the ESPB group compared with 2.0 ± 0.9 in the SAPB group ($p < 0.001$). At 4 hours, the corresponding scores were 2.0 ± 0.9 and 3.0 ± 1.0 ($p < 0.001$), while at 6 hours they were 2.8 ± 1.0 and 3.8 ± 1.1, respectively ($p < 0.001$). At 12 hours, the ESPB group continued to demonstrate significantly lower pain scores (3.2 ± 1.1) compared with the SAPB group (4.2 ± 1.2) ($p < 0.001$). Even at 24 hours, pain scores remained significantly lower in the ESPB group (3.0 ± 1.0) than in the SAPB group (3.8 ± 1.1) ($p = 0.001$). These results indicate superior and sustained analgesic efficacy of ESPB throughout the postoperative period.

Postoperative hemodynamic assessment revealed significantly lower systolic blood pressure (SBP) and heart rate (HR) values in the ESPB group compared with the SAPB group. At 0 hours, the mean SBP was 119.93 ± 7.93 mmHg in the ESPB group and 123.95 ± 9.03 mmHg in the SAPB group ($p = 0.029$). Significant differences persisted at 2 hours (118.02 ± 7.08 vs 122.07 ± 8.05 mmHg; $p = 0.014$), 4 hours (116.02 ± 7.00 vs 120.98 ± 7.97 mmHg; $p = 0.003$), 6 hours (115.00 ± 6.02 vs 119.98 ± 6.97 mmHg; $p = 0.001$), 12 hours (114.00 ± 5.98 vs 117.98 ± 7.02 mmHg; $p = 0.005$), and 24 hours (116.00 ± 5.99 vs 118.95 ± 7.03 mmHg; $p = 0.037$). Similarly, heart rate remained significantly lower in the ESPB group throughout the observation period, ranging from 80.00 ± 7.02 beats/min at 0 hours to 72.95 ± 4.98 beats/min at 24 hours, compared with 85.20 ± 7.29 beats/min to 78.00 ± 6.01 beats/min in the SAPB group (all $p \leq 0.001$). Although diastolic blood pressure values were consistently lower in the ESPB group, none of these differences reached statistical significance (all $p > 0.05$). The lower SBP and HR values observed in the ESPB group likely reflect reduced sympathetic activation secondary to improved pain control.

The incidence of postoperative adverse effects was generally lower among patients receiving ESPB. Postoperative nausea occurred in 6 patients (13.6%) in the ESPB group compared with 13 patients (29.5%) in the SAPB group, although this difference did not achieve statistical significance ($p = 0.07$). Postoperative vomiting was reported in 2 patients (4.5%) receiving ESPB and 6 patients (13.6%) receiving SAPB ($p = 0.14$).

When both symptoms were considered together, the overall incidence of postoperative nausea and vomiting (PONV) was significantly lower in the ESPB group (15.9%) than in the SAPB group (34.1%) ($p = 0.045$). Hypotension occurred in 3 patients (6.8%) in the ESPB group and 4 patients (9.1%) in the SAPB group ($p = 0.69$), while bradycardia was observed in 1 patient (2.3%) and 2 patients (4.5%), respectively ($p = 0.56$). Importantly, no block-related complications were encountered in either group. Overall, ESPB was associated with superior analgesic efficacy, reduced postoperative analgesic requirements, earlier recovery, and a lower incidence of PONV while maintaining a favorable safety profile.

Discussion

The present study compared the postoperative analgesic efficacy of Erector Spinae Plane Block (ESPB) and Serratus Anterior Plane Block (SAPB) in patients undergoing modified radical mastectomy under thoracic segmental spinal anaesthesia. The baseline demographic and clinical characteristics were comparable between the two groups, ensuring that the observed differences in postoperative outcomes were attributable to the analgesic interventions rather than confounding variables. Similar findings were reported by Singh

et al. [11], who demonstrated no significant differences in age, body mass index, ASA status, or operative duration between patients receiving ESPB and SAPB for breast surgery. Likewise, Kumar et al. [12] observed well-balanced baseline characteristics in their comparative evaluation of fascial plane blocks, supporting the validity of postoperative outcome comparisons.

One of the principal findings of the present study was the significantly longer duration of postoperative analgesia observed with ESPB compared to SAPB (10.8 ± 2.4 hours vs. 7.2 ± 2.1 hours, $p < 0.001$). This prolonged analgesic effect is likely related to the wider craniocaudal spread of local anaesthetic within the erector spinae fascial plane, allowing blockade of both dorsal and ventral rami. Similar observations were made by Aksu and Gürkan [13], who reported significantly prolonged analgesia following ESPB in patients undergoing breast surgery. El Ghamry et al. [14] also found that ESPB provided a longer duration of postoperative pain relief than SAPB, thereby delaying the requirement for rescue analgesics.

The quality of analgesia was also superior in the ESPB group, as evidenced by a lower number of rescue analgesic doses and reduced requirement for second-line analgesics. Patients receiving ESPB required significantly fewer rescue analgesic interventions within the first 24 postoperative hours. Comparable findings were reported by Swisher et al. [15], who demonstrated that ESPB reduced postoperative opioid requirements and improved analgesic quality in breast surgery patients. Similarly, Altiparmak et al. [16] reported lower rescue analgesic consumption and superior pain control among patients receiving ESPB compared with other regional analgesic techniques.

Total postoperative analgesic consumption was significantly reduced in the ESPB group. Mean tramadol consumption was substantially lower among ESPB recipients than SAPB recipients, reflecting improved analgesic efficacy. This finding is consistent with the study by Ciftci et al. [17], who demonstrated that ESPB significantly reduced opioid requirements following mastectomy. Likewise, Takimoto et al. [18] observed lower cumulative analgesic consumption and enhanced postoperative comfort in patients receiving ESPB, supporting its opioid-sparing effect.

Postoperative pain scores assessed using the Visual Analogue Scale remained consistently lower in the ESPB group at all postoperative intervals beyond the immediate recovery period. The significant reduction in VAS scores observed from 2 to 24 hours indicates sustained analgesic efficacy. Similar results were documented by Tulgar et al. [19], who reported significantly lower pain scores following ESPB compared with other thoracic wall blocks. Their findings suggested that extensive spread of local anaesthetic within the paraspinal region contributes to prolonged sensory blockade and superior pain relief.

An important observation in the present study was the significantly earlier ambulation and unassisted bladder evacuation among patients receiving ESPB. Early mobilization is a key component of enhanced recovery protocols and contributes to reduced postoperative morbidity. Similar findings were reported by Nair et al. [20], who observed that improved postoperative analgesia following ESPB facilitated earlier ambulation, increased patient comfort, and enhanced functional recovery after breast surgery. The reduction in pain-related limitations likely contributed to the improved recovery profile observed in the ESPB group.

Postoperative hemodynamic parameters also favored ESPB. Patients receiving ESPB demonstrated significantly lower systolic blood pressure and heart rate values throughout the postoperative period, reflecting a reduced sympathetic response to pain. However, diastolic blood pressure remained comparable between the groups. These findings are in agreement with previous studies showing that effective postoperative analgesia contributes to greater hemodynamic stability by attenuating stress-induced cardiovascular responses [13,17].

The incidence of postoperative adverse effects was generally lower in the ESPB group. Although individual rates of nausea and vomiting did not differ significantly, the overall incidence of postoperative nausea and vomiting was significantly lower among ESPB recipients.

This reduction is likely attributable to lower opioid consumption and superior pain control. Similar observations were reported by Altiparmak et al. [16] and Ciftci et al. [17], who demonstrated a lower incidence of opioid-related adverse effects following ESPB. Importantly, no block-related complications were observed in either group, confirming the safety of both techniques when performed under ultrasound guidance.

Overall, the findings of the present study demonstrate that ESPB provides longer-lasting analgesia, lower postoperative pain scores, reduced analgesic consumption, earlier recovery, improved hemodynamic stability, and a lower incidence of postoperative nausea and vomiting compared with SAPB in patients undergoing modified radical mastectomy under thoracic segmental spinal anaesthesia. These results are consistent with contemporary literature and support the preferential use of ESPB as an effective and safe regional analgesic technique for breast surgery.

Conclusion

The present study demonstrated that both Erector Spinae Plane Block (ESPB) and Serratus Anterior Plane Block (SAPB) are effective and safe regional analgesic techniques for postoperative pain management in patients undergoing modified radical mastectomy under thoracic segmental spinal anaesthesia. However, ESPB was associated with significantly superior analgesic outcomes. Patients receiving ESPB experienced a longer duration of postoperative analgesia, delayed requirement for rescue analgesia, lower postoperative pain scores, and significantly reduced consumption of tramadol and diclofenac during the first 24 postoperative hours. Furthermore, ESPB facilitated earlier ambulation and unassisted bladder evacuation, contributing to enhanced postoperative recovery. The incidence of postoperative nausea and vomiting was also significantly lower in the ESPB group, likely due to reduced analgesic requirements. Both techniques demonstrated comparable safety profiles, with no block-related complications observed. Based on these findings, ESPB appears to be a more effective regional analgesic modality than SAPB for patients undergoing modified radical mastectomy.

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