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Erector spinae plane block versus local anaesthesia instillation via the surgical drain in mastectomy patients at a tertiary institution.

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Abstract

Background:

Analgesic strategies for breast cancer surgeries continue to evolve, with the focus on reducing reliance on opioids and improving recovery. The erector spinae plane block (ESPB) and local anaesthesia (LA) instillation via the surgical drain represent two distinct approaches. The primary objective was to compare postoperative pain scores using the universal pain assessment tool (UPAT) between the two groups at 6 and 24 hours.

Methods:

A prospective observational cohort study was conducted in 66 female patients, aged over 18 years, classified ASA I-III, and scheduled for elective unilateral mastectomy. Using purposive sampling, participants were allocated into Group E (n=33), who received ESPB with 20 ml of 0.5% bupivacaine with adrenaline before induction. In comparison, Group L (n=33) received postoperative instillation of 20 ml of 0.5% bupivacaine via the surgical drain.

Results:

Group E had significantly lower postoperative pain scores at 6 hours, median (1 vs 3, p=0.013) and 24 hours, median (1 vs 3, p<0.001), with a medium to large effect size at 24 hours. Group E required significantly less intraoperative morphine, median (3 mg vs 6 mg), p<0.001, experiencing longer time to first opioid request, median (10.4 vs 8.1 hours, p=0.03), and required less postoperative intravenous tramadol (p=0.01). There was no significant difference in the intraoperative analgesia and adjuvant requirements. The patients and surgical characteristics were comparable between the groups. No complications were reported in either group, and Group E showed higher patient satisfaction compared to Group L.

Conclusion:

The ESPB provided more effective and superior postoperative analgesia than LA instillation via the surgical drain, as evidenced by the significantly lower pain scores and perioperative opioid consumption.

Recommendations:

The authors recommend a randomised control trial comparing ESPB, TPVB, and PEC with a large sample size, and presentation of research to breast surgeons to emphasise a paradigm shift.

Keywords: *Erector spinae plane block, local anaesthesia, postoperative analgesia, mastectomy.*
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Introduction

Breast cancer is the most frequently diagnosed cancer, and is the fifth leading cause of cancer deaths and illnesses globally, with approximately 2.3 million cases reported in females. (1). The incidence and mortality rate of breast cancer have risen, and it is anticipated to increase in low- and middle-income countries. (2) The South African National Department of Health (NDOH) has made important advances in addressing the growing breast cancer issue by developing the Clinical Guidelines for Breast Cancer Control and Management. (3). Breast cancer has been made into a national priority in South Africa, as it is the leading cause of mortality amongst women. (3).

One of the treatment modalities for breast cancer is breast surgery, which is among the most commonly performed procedures worldwide. (4) A significant number of women (25 to 60%) develop chronic pain disorders, such as post-mastectomy pain syndrome (PMPS), after undergoing breast cancer surgery. (5). Being pain-free has a positive impact on an individual's quality of life. (6). Acute pain is a subjective experience, and the most effective way to evaluate it is by self-reporting (7). The most appropriate tool to use is the Universal Pain Assessment Tool (UPAT), as it incorporates multiple dimensions of pain, including sensory, affective, and cognitive aspects, providing a holistic view of the patient's experience. (8).

These UPAT assessment modalities make it a multidimensional tool. It is not only culturally sensitive but also allows for different expressions and understandings of pain, which is crucial for diverse patient populations, including those with communication barriers. Figure 1 gives a visual representation of the UPAT score. (8).

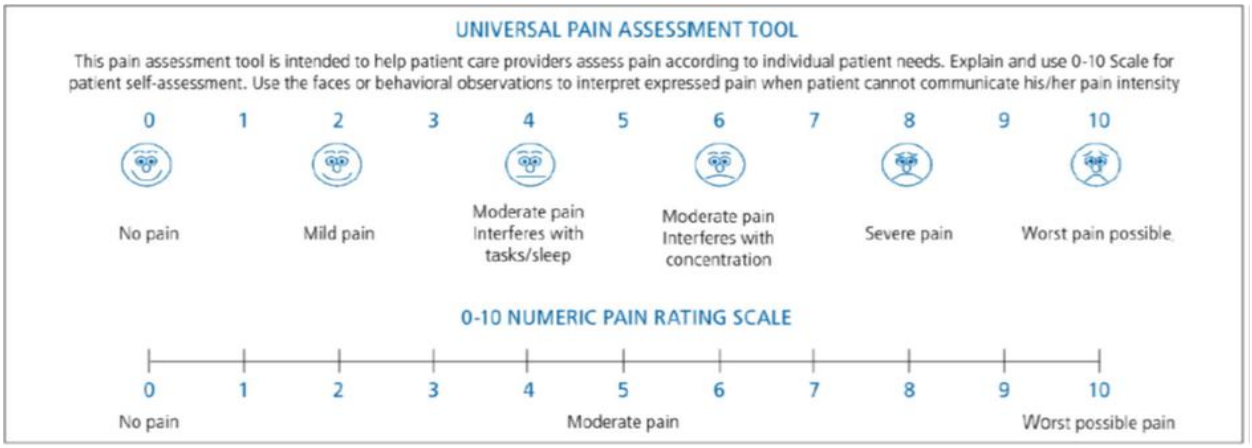

Figure 1: Universal pain assessment tool (UPAT).

Enhanced recovery after surgery (ERAS) protocols for mastectomy are designed to improve postoperative outcomes using a multimodal approach that incorporates evidence-based practices aimed at reducing surgical stress, optimising pain management, and facilitating quicker recovery. (9). A combination of analgesics, including non-opioid medications and regional anaesthesia techniques (such as nerve blocks), is used to manage pain effectively. (9). Regional anaesthesia for breast surgery has offered significant benefits to patients, including effective perioperative pain relief, decreased opioid consumption, and a lower incidence of postoperative nausea and vomiting (PONV), along with a reduction in other opioid-related side effects. (10).

Some regional techniques that may be used in breast surgery include thoracic-paravertebral block (TPVB), intercostal block, serratus anterior plane block (SAPB), erector spinae plane block (ESPB), and pectoral I (PEC I) and pectoral II (PEC II) blocks. (4). The ESPB, first described in 2016, is widely recognised for its safety, simplicity, and efficiency in providing analgesia for thoracic surgery and management of thoracic neuropathic pain. (11). In this block, local anaesthesia (LA) is administered into the fascial plane situated between the erector spinae muscle and the transverse processes of the vertebrae, thereby making it a field block. (11).

Complications associated with ESPB may be block failure due to poor technique and local anaesthetic toxicity when using large volumes. (12, 13), vessel injury, and

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pneumothorax (13). These complications are not expected under ultrasound guidance, although they can occur due to loss of hand-eye coordination and the depth of the musculature. Motor weakness can occur if the LA spreads to the lumbar plexus during a low thoracic ESPB (13). If a patient's pain has been well-managed, their satisfaction may be assessed using a numerical rating scale (NRS). The NRS is an 11-point ordinal scale used to measure satisfaction reported by patients. Patients choose a number from 0 to 10 to indicate their level of satisfaction: 0 = not satisfied at all and 10 = very satisfied. (14). It is important to help the patient differentiate between satisfaction with pain management and satisfaction with overall hospital care, taking into account cognitive and behavioural factors. (15).

Surgeons have used the administration of LA via the surgical drain in post-mastectomy patients as part of multimodal analgesia, and it has been researched by multiple authors. (16, 17). The proposed mechanism of the LA via the surgical drain is its effect on the cutaneous branches of the intercostal nerve in the region where the drains are placed. (16, 17). These studies show that even though we frown upon the choice of LA via the surgical drain by the surgeons at Chris Hani Baragwanath Academic Hospital (CHBAH), LA via the surgical drain does reduce pain scores and opioid consumption. Despite adequate intravenous (IV) analgesia and regional techniques, some patients may still require postoperative analgesia, which is addressed by using the World Health Organisation (WHO) ladder. (18). It is a 3-step ladder that addresses pain management depending on the intensity of the pain, with prescribed choices of analgesia for each step. Opioids are given in various forms and routes; it is easier to calculate the different opioids into morphine equivalents for comparison. (19).

A high prevalence of PMPS at CHBAH hospital was reported in 2016 (20). The study found that most breast surgeries were being performed using GA, IV multimodal analgesia, and LA via the surgical drain. (20). However, the surgeons at CHBAH prefer to inject LA via the surgical drain at the end of surgery rather than using a regional technique, as this has been shown by multiple studies to be satisfactory. (16, 17, 21). The ESPB is superior to LA via the surgical drain. (22, 23). Although these studies were conducted in other disciplines, there is still no clear consensus on whether ESPB is superior to LA via the surgical drain, specifically in breast surgery. Nerve blocks bring down the requirement of opioids implicated in cancer recurrence. (24, 25). The effect of opioids on tumours is protumoural and causes angiogenesis by immunosuppression and reducing natural killer cells.

A paradigm shift in the concept of anaesthetic and surgical management of cancer patients, particularly breast cancer, concerning pain management, must occur at CHBAH.

This study aimed to compare the ESPB to local anaesthesia via the surgical drain in female patients presenting for unilateral mastectomy at CHBAH.

The primary objective of this study was to:

- Compare postoperative pain scores using the UPAT between the two groups at 6 and 24 hours.

The secondary objectives of this study were to:

- Compare the frequency of PONV
- Compare the time to first request for systemic opioids postoperatively
- Compare the postoperative systemic opioid consumption in morphine equivalents
- Compare patient satisfaction using the numerical rating scale at 24 hours
- Describe the complications of ESPB.

Methods

Study design

A prospective, observational cohort, single-site study design was followed and reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines for the Equator Network.

Study setting

The study was conducted at CHBAH from 30/09/2025 to 17/12/2025. Affiliated with the department of anaesthesiology at the University of Witwatersrand. CHBAH is a 3200-bed central hospital with 25 theatres, of which 3 are general surgery theatres. The breast theatres perform an average of 480 mastectomies annually in theatres 15,16, and St. John's Breast Theatre twice a week on Tuesday and Thursday.

Participants

The study consists of adult female patients, ASA I-III, who presented for a single-sided mastectomy.

Inclusion criteria

- American Society of Anaesthesiologists (ASA) physical status class I-III
- female patients 18 years and older
- elective single-sided mastectomy
- patients undergoing mastectomy between 07h00 and 13h00 on weekdays.

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Exclusion criteria

- allergy to LA and opioids
- previous diagnosis of chronic pain syndromes
- Previous breast surgery on the same side
- male patients
- contraindications to regional anaesthesia
- patients who choose an analgesic modality other than the ESPB or LA instillation via the surgical drain.

Sampling method

A purposive sampling method was used for this study. All eligible patients on the breast theatre booking lists who fit the inclusion criteria were invited to participate in the study at the preoperative visit.

Sample size

Sample size was determined in consultation with a biostatistician. The sample size was computed using STATA® version 18. The estimated sample size for the two-sample means test is Satterthwaite's t-test, assuming unequal variances at a 5% alpha, power of 80%, and a pain score of 3 and 5 in the two groups, respectively, for a delta level of -4, giving each group 30, and a total sample of 60 (23).

Bias

To minimise bias, the researcher was taught and validated to perform an ESPB by a senior anaesthesiologist who holds a postgraduate diploma in regional anaesthesia from the University of Montpellier, utilising Mindray ultrasound, which is standardised to depict the image required. Every ESPB performed was video recorded, indicating the spread of the LA into the fascial plane, and the video was analysed by the same regional anaesthesiologist. Intraoperative analgesia was left at the discretion of the attending anaesthetist. Standard post-mastectomy protocol for analgesia to prevent breakthrough pain was followed by the nursing staff for all participants.

Data collection

Data collection proceeded with patients presenting for an elective mastectomy who fit the inclusion criteria identified using the theatre booking list. These patients are commonly operated on in St John's and JD Allen theatres 15 and 16. The patient's primary anaesthetist for the list performed the preoperative visit. The decision regarding regional technique was left to the patient and the primary anaesthetist, based on risk assessment during the preoperative visit. The patients were offered LA via the surgical drain, ESPB, TPVB, or PEC block as analgesic options. The primary anaesthetist informed the researcher about the regional technique chosen by the patient.

Patients who chose either LA via the surgical drain or the ESPB were approached by the researcher to participate in the study during the preoperative visit. An information sheet was provided to the patient explaining the study; those agreeing to participate were given an informed consent form to sign. The patients were encouraged to ask further questions about the study. The primary anaesthetists were notified of the patient's participation in the study. Patients who select any other prescribed regional modality were excluded from the study; however, the quality of care was not compromised. Patients who selected the ESPB were allocated to group E, and those who selected LA via the surgical drain were allocated to group L.

Group E: After placement of ASA monitors in the sitting position in theatre, the ESPB was placed by the primary researcher according to the South African Society of Anaesthesiologists Guidelines for Regional Anaesthesia (26). The primary researcher's ESPB technique was taught and validated by a senior anaesthesiologist with a postgraduate diploma in regional anaesthesia from the University of Montpellier before the study. Every ESPB performed during the study was video recorded, indicating the spread of the LA into the fascial plane, and the videos were analysed by the same regional anaesthesiologist.

An ultrasound machine with a linear transducer (5.0 - 15 MHz) was used to perform the ESPB. The transducer probe of the ultrasonography machine was placed 3 cm lateral to the 5th spinous process. Once visualisation and identification of the trapezius, rhomboid major, and erector spinae muscles were achieved, a 22-gauge 0.7 x 50 mm needle was inserted in the plane, cranial to caudal, into the erector spinae plane. Bupivacaine 0.5% plus adrenaline (1:200 000) at a volume of 20 ml was administered. A toxic dose of 2 mg/kg was calculated and not exceeded (27). The primary researcher allowed the primary anaesthetist to continue with the general anaesthesia. Any rescue analgesia required by the patient intraoperatively was at the discretion of the primary anaesthetist.

Group L: The primary anaesthetist performed the general anaesthetic. The intraoperative IV analgesia was left to their discretion and collected postoperatively. At the end of the procedure, patients were administered not more than 2 mg/kg of 0.5% bupivacaine with adrenaline (1:200,000) via the surgical drain. The total volume administered was 20 ml. The drain was clamped and released after 30 minutes in the post-anaesthetic care unit (PACU).

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All participants were reviewed in the ward by the primary researcher at T0 (6 hours postoperatively) and T1 (24 hours postoperatively) to assess pain scores using the UPAT. Clinically significant pain score was assessed as any persistent pain with a score greater than or equal to 4 using the UPAT. Nursing staff in the ward were notified of the patient's participation in the study and had to adhere to the post-mastectomy protocol for analgesia to prevent any breakthrough pain. At T1, the primary researcher also noted the time to first systemic analgesic requirement, total systemic opioid analgesic requirements in morphine equivalent doses, patient satisfaction using an NRS, and complications. All complications were communicated and managed as they arose.

Data measurements

All data was captured on a collection sheet approved by the postgrad assessors panel of the University of Witwatersrand during the protocol stage. This sheet contained the UPAT used by participants to indicate pain score at 6 and 24 hours postoperatively. The NRS satisfaction scores obtained at 24 hours ranged from 0 (not satisfied) to 10 (very satisfied). The PONV incident was a yes-or-no question. Complications specific to the ESPB were captured in a table, where the primary researcher ticked which complication occurred and what management was undertaken. The data was then consolidated into a single Microsoft Excel® sheet. The Microsoft Excel® sheet had a formula to convert the various opioids into morphine equivalents.

Statistical analysis

The data was analysed using SPSS® (V28). The Shapiro-Wilk test of normality was used to assess the normal distribution of continuous data. Categorical variables were described as frequencies and percentages, while continuous variables were described as medians and interquartile ranges, as the data were not normally distributed. Mann-Whitney U tests were used to compare medians between independent groups. The Wilcoxon signed-rank test with repeated measures was used to analyse differences between medians of two dependent samples. Chi-square tests were used to analyse categorical variables. A p-value of < 0.05 was considered statistically significant at 95% confidence interval (95% CI) (23).

Ethical considerations

Approval was obtained from the Human Research Ethics Committee (Medical), the Post Graduate Committee (Medical) of the University of the Witwatersrand (study number M250441), and the Chris Hani Baragwanath Academic Hospital (CHBAH) Medical Advisory Committee, National Health Research Database (study number GP_202408_048).

The study adhered to the Protection of Personal Information (POPI) Act, where no patient-identifying or medical professional information will be published or disclosed as part of the study. A study number was allocated to each patient and was used to maintain anonymity and confidentiality. The data will remain confidential, with access only provided to the researcher and supervisors for both paper-based and electronic information. Paper data collected is stored by the primary researcher in a locked cupboard. Electronic data is password and PIN-protected.

Informed consent

Informed consent was obtained at the preoperative visit for all eligible adult female patients presenting for a single-sided mastectomy. Information regarding the study aims, objectives, the analgesic interventions, possible benefits, complications, voluntariness, and the right to decline participation in the study was explained.

This information was shared verbally, and an information sheet was shared for them to keep. The researcher was available to answer any questions that arose. If the patients agreed to participate, they signed a consent form. Patients were informed that they will be able to withdraw from the study at any point without compromising the quality of care.

Measured variables

Variables included age, BMI, ASA classification, neoadjuvant therapy, chemotherapy received before surgery, cancer staging, and surgical time. In the intraoperative period, additional analgesia and PONV prophylaxis were indicated in the anaesthetic charts. Time to first opioid request, the opioid given (tramadol), route of administration, and total dose given in 24 hours were recorded.

Results

Seventy participants were recruited (Figure 1), and four were excluded from the study. The exclusions were two participants who were postponed due to time constraints, one patient who received a PEC block, and one patient who received a TPVB, which automatically excluded her from the study. Baseline characteristics were comparable between groups; however, participants in Group E were significantly older than those in Group L (Table 1). There was no statistical significance in the overall surgical time between Group E (81 min, IQR 69.5-92.5) and Group L (80 min, IQR 62.5-90; p=0.472).

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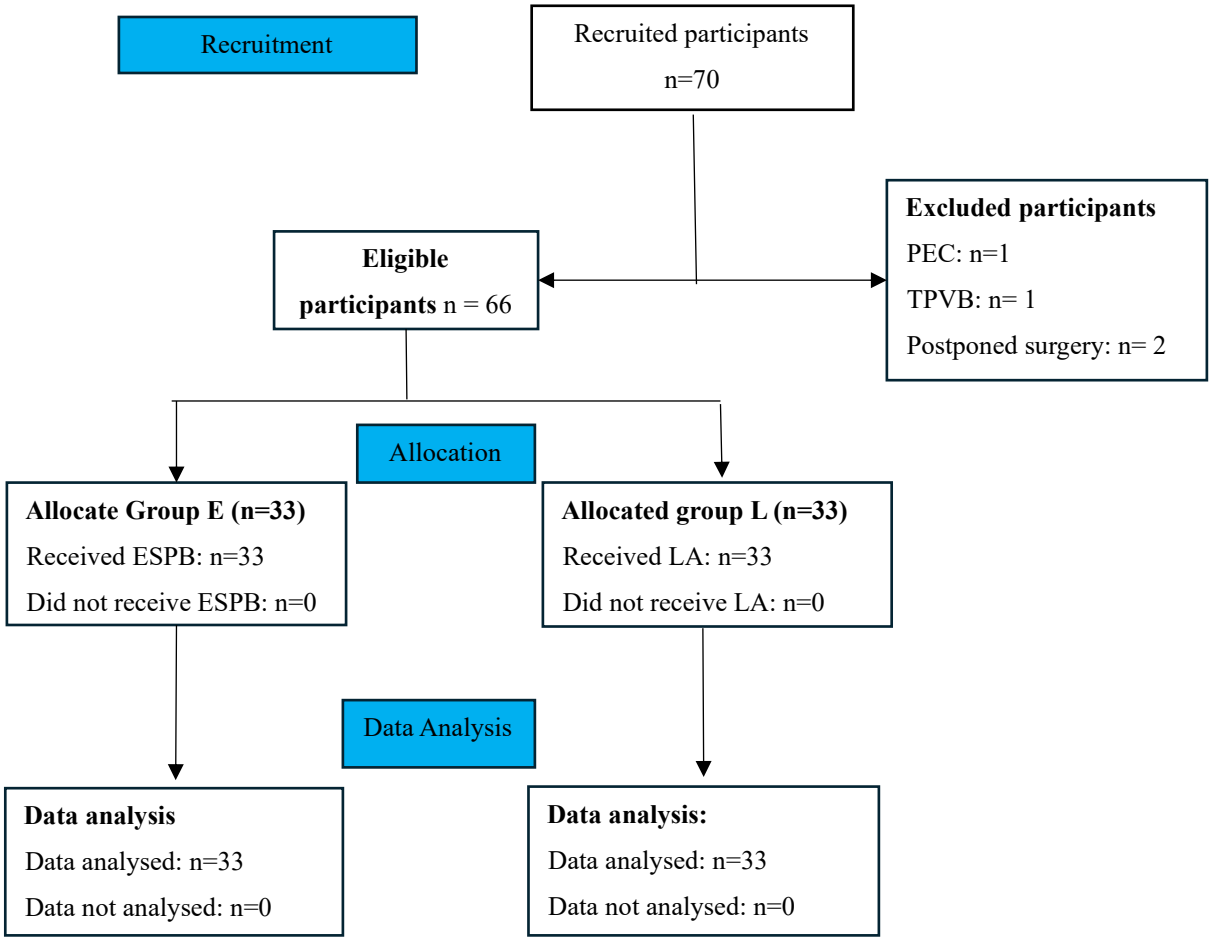

Figure 1: Case selection flow diagram.

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Table 1: Baseline patient characteristics

Characteristics	Group E n=33	Group L n=33	*p* value
Age (years)	63 (51-70.5)	51(41-58)	0.002*
Body mass index (kg/m)	27.9 (23.9-31.0)	29.4 (26.3-31.7)	0.238
ASA			0.475
II	30 (90.0 %)	27 (81.8 %)	
III	3 (9.1 %)	6 (18.2%)	
Cancer staging			0.143
I	2 (6.1%)	1 (3%)	
II	9 (27.3%)	18 (54.5%)	
III	22 (66.7%)	14 (42.4%)	
Neoadjuvant therapy			0.159
Yes	22 (66.7%)	27 (81.8%)	
No	11 (33.3%)	6 (18.2%)	
Radiotherapy			1.00
Yes	1 (3%)	0	
No	32 (97%)	33 (100%)	

Data presented as n (%) or median (interquartile range). Group E: erector spinae plane block (ESPB). Group L: local anaesthesia instillation via surgical drain. Fisher's exact test was used.

Postoperative pain scores (Table 2) showed that Group E had better pain scores (no to mild pain) at both times. The time to first request for rescue opioid analgesia was significantly lower in Group E (median 10.4 hours) than in Group L (median 8.1 hours), p=0.030. Postoperative systemic opioid consumption in morphine equivalents is shown in Table 3. Patients in Group E required significantly less postoperative IV tramadol (converted to morphine equivalents) in the first 24 hours (median 10mg vs 10mg, with a lower, tighter IQR of 0-10, p=0.010).

Table 2: Postoperative pain scores

Outcome variable	Group E Median (IQR)	Group L Median (IQR)	Z score	*p* value	Cohen's r
T0: 6-hr pain scores	1 (0-2.5)	3 (1-3.5)	-2.490	**0.013***	0.31
T1: 24-hr pain score	1 (0.5-2)	3 (2-4)	-4.501	**<0.001***	0.55

Data presented as median (interquartile range). Group E: ESBP; Group L: local anaesthesia instillation via the surgical drain.

Intraoperative morphine consumption was significantly lower in Group E (median 3mg vs 6mg) than in Group L. Additional analgesia given intraoperatively was comparable between the two groups. Please see supplementary information.

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Table 3: Time to first opioid and postoperative analgesia in morphine equivalent

Outcome variables	Group E Median (IQR)	Group L Median (IQR)	z score	*p* value	Cohen's r
Time to first opioid (hrs)	10.4 (7.2-17.1)	8.1 (5.9-19.4)	-2.174	**0.030***	0.27
Postoperative IV tramadol in morphine equivalent	10 (0-10)	10 (5-20)	-2.593	**0.010***	0.32

Data presented as median (interquartile range) IV = intravenous.

Patient satisfaction as measured on an NRS was significantly higher in Group E (median satisfaction score 10, IQR 9.5- 10) compared to Group L (9, IQR 8-10; *p*=0.001. This difference represents a moderate to large effect size (Cohen's r=0.04), indicating that the patients receiving the ESPB were more satisfied with their overall pain management. A clinically significant trend was also observed in the incidence of PONV, where fewer patients in Group E experienced PONV (n=6, 18.2%) compared to Group L (n=12, 36.4%), *p*=0.097. There were no complications noted or reported.

Discussion

Group E had significantly lower pain scores on the UPAT, ranging from no pain to mild pain, with a median of 1(0-2.5) at 6 hours, compared with Group L, which had mild to moderate pain. Median 3(1-3.5), *p*=0.013. These findings were consistent with a previous study, which compared ultrasound-guided ESPB with local infiltration at the incision site in patients undergoing nephrolithotomy (23). The ESPB provided adequate analgesia to significantly lower NRS in Group B (n=33, median 2 (0-2)) compared to the LA infiltration Group C (n=33, median 3 (2-3); *p*= 0.000, at 6 hours postoperatively, further reducing the need for rescue analgesia (23). Similar findings have been reported in a previous study: ESPB group median 3 (2-4) and control group median 4 (3-5) (28).

At 24 hours postoperatively, Group E similarly had a lower UPAT score (median 1(0.5-2)), compared to Group L (median 3(2-4)), owing to the analgesic benefits of the ESPB in acute post-mastectomy pain management compared to the local anaesthesia instillation via the surgical drain. In contrast, another study assessed the postoperative analgesic effects of the ESPB in modified mastectomy patients compared to the control group without the block. (28). Both groups had comparable NRS scores (median 2, 1-3); however, the ESPB group required less postoperative analgesia, and overall 24-hour morphine consumption was significantly lower (by 65%), whereas all patients in the control group required supplementary morphine. (28). Notably, in our study, all patients received morphine in the intraoperative period, with Group E receiving 50% less than Group L, further supporting its use in reducing intraoperative nociceptive input.

The ESPB reduced opioid side effects, such as PONV, by 50%, with high satisfaction rates with the management of the pain rather than the surgical procedure itself. No complications related to the ESPB or LA were recorded, and the time to first opioid analgesia was prolonged in Group E. This study, although similar to previous work (29), provided general anaesthesia to all patients rather than sedation with propofol infusion. The results were comparable, with reductions in postoperative pain scores and time to first opioid request, but the median satisfaction score was higher (10, IQR 9.5–10).

Another study compared TPVB and ESPB for postoperative analgesia in thoracic and breast surgery; the results showed that both regional techniques provided comparable postoperative analgesia in breast surgery, with ESPB having fewer complications compared to TPVB. (30). A randomised controlled trial offered ESPB vs transversus abdominis plane block (TAPB) in Caesarean delivery under spinal anaesthesia. (31). The blocks and overall analgesic requirements were comparable at all time intervals. In contrast, a similar study showed that ESPB was superior to TAPB. (32), and further work confirmed these findings (33). There is a paucity of literature comparing the ESPB and LA instillation in mastectomy patients in our setting and globally. Recent studies have described LA instillation via the surgical drain in post-mastectomy patients as part of the multimodal anaesthesia, but the results are variable with a consistent trend (LA was instilled via surgical drain 4 hourly for 24 hours in both studies) (16, 17). Another study on mastectomy patients found that irrigating the drain with bupivacaine did not significantly reduce pain or the need for morphine compared to using a saline placebo in mastectomy patients. (17). In contrast, other authors found that mastectomy patients who received bupivacaine through the drain experienced longer-lasting pain relief (about 14.6 hours) and required less opioid medication than those who received either saline or no treatment. (16). This study

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revealed that LA instillation via the surgical route, compared with placebo or no treatment, still has a role in providing analgesia when no other options are available. (16).

Two additional studies compared the effectiveness of the ESPB with LA delivered via the surgical drain. (22, 23). One study found that the ESPB group required fewer opioids and had a longer time before needing additional pain relief compared to those who received local anaesthetic directly into the incision. (23). Another study on patients undergoing laparoscopic colorectal resection found that the ESPB group reported lower pain scores on the VAS scale and required considerably less postoperative pain medication. (22). Both investigations concluded that the ESPB was a more effective and versatile approach.

The safety profile of the ESPB is unmatched compared to other competitive regional techniques, such as TPVB. (12). In numerous studies in which the ESPB was performed, no complications were reported, either related to the block itself or to LA use. (12, 29, 31, 32). It is safe to say that the ESPB has been an excellent tool for thoracic and abdominal surgery since it was first described in 2016, and, as part of the multimodal opioid-sparing techniques supported by ERAS for breast surgery, its value cannot be ignored. (11).

Generalisability

The findings in this prospective, observational cohort study apply to the patient population typically presenting for a single-sided mastectomy in public tertiary hospitals across South Africa. Furthermore, the study was conducted in a single-centre, academic hospital in Johannesburg, with purposive sampling, located in a low to middle-income area. The results cannot be extrapolated to the private hospitals across South Africa with high-income population, urban areas, or even western countries with no resource constraints (wound catheter, electronic PCA pumps, and unlimited analgesic options across the classes). Therefore, it can be said that the study recommendations and results may be applied to other hospitals performing unilateral mastectomies while taking into consideration local, structural, and possible resource limitations.

Conclusion

This single-centre prospective observational cohort study emphasised the simplicity and effectiveness of using ultrasound-guided ESPB in mastectomy procedures. The technique was found to reduce pain intra- and post-operatively, lowering the need for opioids, reducing the incidence of PONV, and extending the time to first opioid dose. These outcomes further contributed to greater overall patient satisfaction, reducing the incidence of complications and possibly the development of chronic pain syndromes.

Limitations

This was a single-centre study; patients knew exactly which intervention would be given to reduce their pain, thus increasing the risk of performance bias or participant reactivity. Therefore, the results may not be extrapolated to other populations. We used purposive sampling for a short time, which may have contributed to selection bias. This study was done in partial fulfilment of the primary researcher's master of Medicine degree; therefore, obtaining a large sample size was not possible due to the time limitation. There was a statistically significant difference in age and cancer staging between the two groups. Confounding bias may result because Group E had older patients with more advanced cancer staging compared to Group L.

Recommendations

The authors recommend a randomised control trial comparing ESPB, TPVB, and PEC with a large sample size, and presentation of research to breast surgeons to emphasise a paradigm shift. This may influence surgical and anaesthesia guidelines in the institution and beyond. Interprofessional collaborative education will need to occur between the disciplines, with dedicated teaching of the various regional modalities. It may fill a gap in the existing literature regarding the analgesic benefits and safety of ESPB compared to LA in this surgical context, promoting further research or adaptations of techniques in similar clinical settings.

Data availability

Data can be made available from the corresponding author upon request.

Author's Biography

Neo Motaung is a third-year medical registrar in the department of Anaesthesiology at the University of Witwatersrand. This research was done in partial fulfilment of the requirements for her degree of Master of Medicine in the branch of Anaesthesiology. She completed her undergraduate medical studies at the University of Limpopo (Medunsa) and graduated in 2014. She holds a Diploma in Anaesthesiology (2019) and is currently a registrar completing rotations that form part of the clinical requirements within the WITS circuit, with Chris Hani Baragwanath Academic Hospital being her base hospital, Johannesburg, Gauteng.

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Mathabe Sehlapelo is a senior anaesthesiologist at Chris Hani Baragwanath Academic Hospital and lecturer in the Department of Anaesthesiology, University of Witwatersrand, Johannesburg, South Africa. She is the domain head of airway management, breast, and endocrine. She is committed to health system sciences education through innovative pedagogy, student mentorship, health system management, and community engagement.

Conflict of interest
The authors declare no conflict of interest.

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List of abbreviations
ASA American Society of Anaesthesiologists
BMI Body Mass Index
CHBAH Chris Hani Baragwanath Academic Hospital
ERAS Enhanced Recovery After Surgery
ESPB Erector Spinae Plane Block
GA General Anaesthesia
IQR Interquartile Ranges
IV Intravenous
LA Local Anaesthesia
NDOH National Department of Health
NRS Numerical Rating Scale
PACU Postoperative Acute Care Unit
PEC Pectoral Nerve Block
PMPS Postmastectomy Pain Syndrome
PONV Postoperative Nausea and Vomiting
SAPB Serratus Anterior Plane Block
STROBE Strengthening The Reporting of Observational Studies in Epidemiology
TAPB Transversus Abdominis Plane Block
TPVB Thoracic Paravertebral Block
UPAT Universal Pain Assessment Tool
VAS Visual Analogue Score
WHO World Health Organisation

Authors contribution
Neo Motaung
I drafted the synopsis of the research, an idea, and a presentation. With constant feedback and assistance from my supervisors, we developed an exceptional research proposal and applied for ethics approval. I meticulously collected and arranged the data before submission and collaboration with a statistician for analysis. I produced a well-written research report after extensive guidance, motivation, and encouragement from my supervisors, indicating my commitment to this report.
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