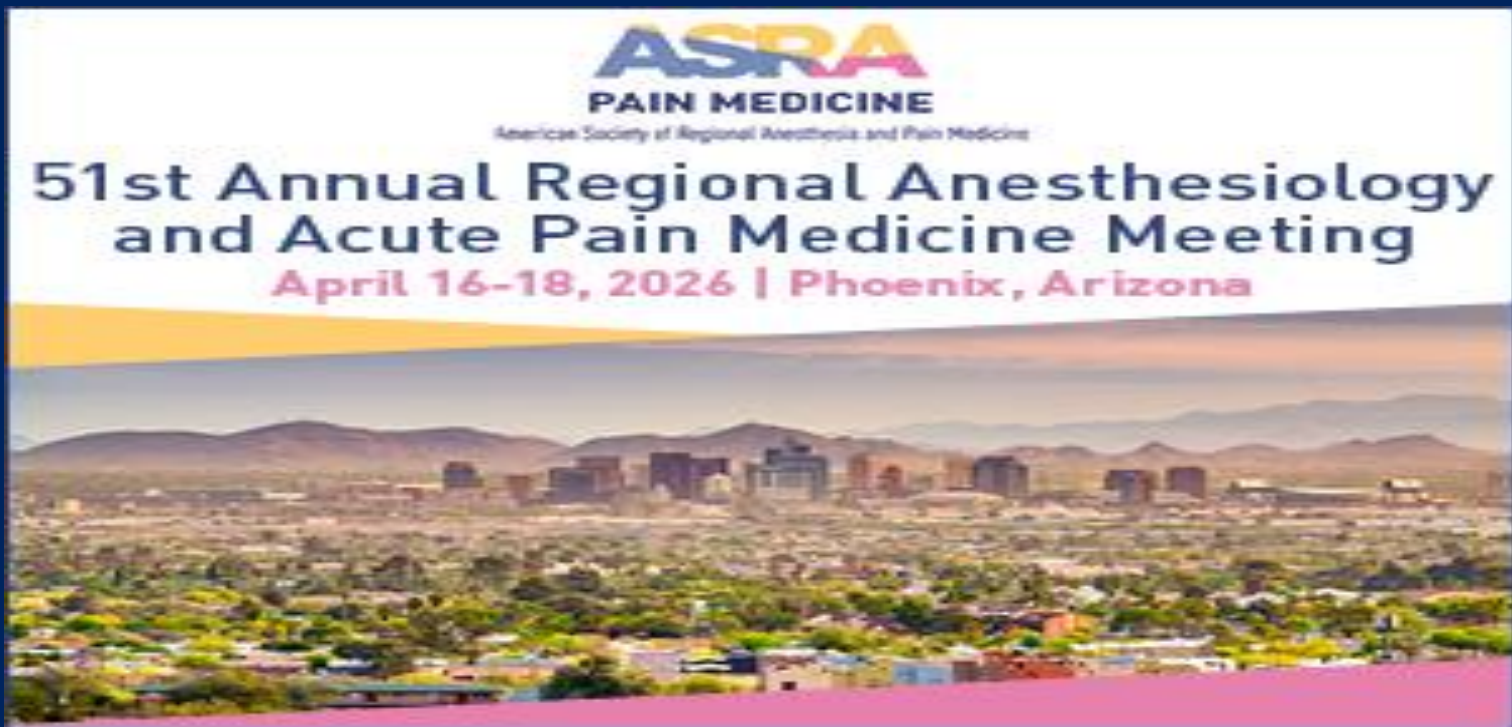




A Retrospective Comparison of One versus Two Level Paravertebral Blocks with Postoperative Outcomes in Breast Surgery Patients

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Background

- The thoracic paravertebral block (TPVB) can be used to provide perioperative analgesia in breast surgery (1)
- Local anesthetic is injected into the paravertebral space which produces ipsilateral somatic and sympathetic nerve blockade across multiple dermatomes, providing effective analgesia for breast surgery (2).
- TPVB can be administered as a single-level injection, multiple-level injections, or a continuous catheter
- A prior study looking at the efficacy and safety of single vs double-level TPVB in patients undergoing mastectomy found that patients receiving double-level TPVB had significantly less postoperative analgesic consumption (3).
- Our objective was to measure the association of one versus two level TPVB on all breast surgeries for cancer as there are few studies comparing this association.

Methods

- This was a retrospective cohort study measuring the association of one versus two level TPVB with postoperative outcomes in patients undergoing breast surgery.
- The primary outcome of interest was opioid consumption in the post-anesthesia care unit (PACU).
- Secondary outcomes included opioid use intra-block and intraoperatively, pain scores measured in the 10-point numeric rating scale (NRS), postoperative nausea and vomiting (PONV), and PACU length of stay.
- All patients who underwent partial mastectomy or mastectomy were extracted from the institution’s EMR from 2021 to 2024.
- Wilcoxon rank sum test and chi-squared test were used to compare continuous and categorical variables, respectively (**Table 2**). A P-value <0.05 was considered statistically significant.

Results

- There were 227 patients included in the analysis, in which 71 (31.3%) and 156 (68.7%) received TPVB at one versus two levels per side, preoperatively.
- At baseline, there were no differences in age, sex, ASA PS classification score, history of chronic opioid use, or surgical procedure (**Table 1**).
- In the one versus two-level PVB cohorts, there was no difference in the median [quartiles] opioid administered during the block (5mg [5, 5] versus 5mg [5, 5], respectively, P=0.06), intraoperatively (10mg [10, 20] versus 10mg [10, 20], respectively, P=0.07), or in the PACU (2mg [0, 7] versus 4.25mg [0, 8], respectively, P=0.11).
- There were no differences in pain scores in the PACU. The average pain score on the 10-point NRS was 1.25 [0, 3.62] versus 1.83 [0, 3.81] in the one versus two-level TPVB cohorts, respectively (P=0.55).
- There was no difference in incidence of PONV (P=0.99).
- There was a statistically significant difference in PACU length of stay in favor of the two-level TPVB by 19 minutes (P=0.04) (**Table 2**).

	One-Level PVB	Two-Level PVB	P-value
Total	71	156	
Age (years), median [quartiles]	57 [48, 67]	57 [48, 66]	0.98
Male sex, n (%)			
ASA PS ≥ 3, n (%)	23 (32.4)	73 (46.8)	0.06
History of chronic opioid use, n (%)	4 (5.6)	5 (3.2)	0.62
Surgical Procedure, n (%)			0.10
Partial Mastectomy	45 (63.4)	79 (50.6)	
Mastectomy	26 (36.6)	77 (49.4)	

Table 1. Baseline patient characteristics between both study cohorts
Abbreviations: ASA PS, American Society of Anesthesiologists Physical Status
PVB, Paravertebral block

Outcomes	One-Level PVB	Two-Level PVB	P-value
Opioid consumption (mg MEQ), median [quartiles]			
Intra-block	5 [5, 5]	5 [5, 5]	0.06
Intraoperative	10 [10, 20]	10 [10, 20]	0.07
PACU	2 [0, 7]	4.25 [0, 8]	0.11
PACU Pain (10-point NRS), median [quartiles]			
Average	1.25 [0, 3.62]	1.83 [0, 3.81]	0.55
Worst	3 [0, 7]	4 [0, 7]	0.39
Best	0 [0, 0]	0 [0, 1]	0.39
Postoperative Nausea Vomiting, n (%)	16 (22.5)	34 (21.8)	0.99
Post-anesthesia care unit length of stay (minutes)	90 [61, 116]	71 [47.8, 111.3]	0.04

Table 2. Comparison of outcomes between both cohorts.
Abbreviations: MEQ, intravenous morphine equivalents, NRS, numeric rating scale, PACU, post-anesthesia care unit

Discussion

- In our study, we demonstrated that adding an additional level to TPVB for breast surgery was not associated with improved pain or opioid consumption, however, it was associated with improved PACU length of stay.
- The single-level injection TPVB is known to be associated with decreased patient discomfort and less needle-related complications. Multi-level TPVBs are associated with a decreased incidence of unblocked segments and lower risk of intravascular or intrathecal local anesthetic administration due to dose distribution over injections (3).
- Prior research in patients undergoing total mastectomy, showed that patients receiving double-level TPVB had significantly less postoperative analgesic consumption. However, our findings may differ as our cohort underwent less extensive procedures.
- While multi-level paravertebral blocks have demonstrated superior analgesia in some studies, the marginal clinical benefit may not be worth the additional procedural risk, increased local anesthetic dose, and resource utilization in patients undergoing less extensive breast surgeries.

References

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