

Comparison of post-operative pain with and without Pectoral Block in patients undergoing Modified Radical Mastectomy

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Abstract

Objective: This study compares mean post-operative pain in patients undergoing modified radical mastectomy under general anesthesia without the use of ultrasound with and without pectoral (PECS) block.

Material and Methods: A randomized control trail was conducted at Ayub Teaching Hospital, Abbottabad. Participants of the study were those who met the inclusion criteria. 70 patients in total were divided randomly into two equal groups; the group with PEC block and the group with non-PEC block, were then examined. Participants' levels of post-operative pain were measured six and twelve hours after surgery. Data was gathered, and SPSS version 22 was used for descriptive analysis.

Results: The mean age of the patients was 31 ± 3 years. The mean duration of cancer was 7.2143 ± 4.28646 months. Among the 35 participants from PEC group 31 had no pain after 6 and 12 hours. 4 patients had mild pain after 6 hours and one had mild pain at 12 hours, 3 patient had moderate to severe pain at 12 hours. Among the other group who did not receive pectoral block, 25 patients had moderate to severe pain, 10 had very severe pain at 6 hours and all the 35 patients had very severe pain at 12 hours.

Conclusion: In female patients undergoing modified radical mastectomy (MRM) under general anesthesia, post-operative pain with PEC block demonstrated noticeably superior pain control as compared to the patients without PEC.

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Introduction:

Modified radical mastectomy (MRM) has been a common surgical treatment option for breast cancer, which is a major cause of morbidity and mortality globally.¹ Patients having chest wall procedures, like breast and anterior thoracic surgeries, might experience excruciating early post-operative pain and discomfort, which may result in thrombosis, MI, and damage of the immunological and pulmonary systems. Additionally, significant patients up to 25-60% may experience debilitating, long standing pain. Managing postoperative pain well is essential for improving patient outcomes, lowering the negative effects of opioids, and encouraging a quicker recovery.² Regional penetration, intercostal nerve block, thoracic analgesia via epi-

dural injection, and paravertebral block were among the methods used to manage this pain; however, because they do not block the long thoracic and thoracodorsal nerves, medial and lateral pectoral nerves, or both, they might not be appropriate for all breast surgeries.³ For patients following breast surgery, pectoral block (PEC) has become an attractive way of alleviating post-operative pain.⁴ By injecting a local anesthetic around the pectoral nerves, this block effectively relieves anterior chest wall pain.⁵ Deep nerve block procedures might result in problems like hypotension, bleeding, along with pneumothorax. In 20-40% of situations post-operative analgesia utilizing NSAIDS or opioids alone is ineffective.^{3,6} PEC has been successful in minimizing post-operative pain and opiates

Table 1: Demographics

	N	Minimum	Maximum	Mean	Std. Deviation
Age	70	31.00	56.00	45.1714	7.02165
Weight	70	43.00	73.00	59.6286	7.37243
Duration of cancer	70	1.00	15.00	7.2143	4.28646

use in those following breast surgery, as demonstrated by recent studies.^{7,9} These are typically performed by injecting a local anesthetic in the fascial plane between the pectoralis minor and major muscles (PEC I block) and in the fascia covering the serratus anterior muscle just at the third rib (PEC II block) under ultrasound guidance before the surgery after induction of anesthesia. These blocks address the long thoracic nerves, pectoral, intercostal III, IV, V, and VI, as well as the intercostal brachial.⁸ Our study's purpose is to compare mean post-operative pain with and without PECS in female patients undergoing modified radical mastectomy (MRM) under general anesthesia. Post-operative pain is common after modified radical mastectomy under general anesthesia, which is controlled with IV analgesia. Literature demonstrates that adding PECS can significantly reduce post-MRM pain, however it is not in common practice. It might be because of insufficient local proof. Therefore, we carried out this study to gather information regarding effectiveness of adding PECS block to general anesthesia. We also modified this technique by injecting local anesthetic intraoperatively in pectoralis fascia and in fascia covering the serratus interior under direct vision. By modifying this technique, we don't need expertise in doing ultrasound neither we need ultrasound machine and time is also saved in omitting additional minor procedure before commencement of surgery, as our aim was to control post-operative pain which has same result as that to do under ultrasound guidance. If it may be proved through this study that PECS is effective in reducing post-operative pain after modified radical mastectomy pain, and has same results of doing it under ultrasound guidance then in future, we will intend to incorporate PECS block in our modified radical mastectomy cases.

Material and Methods:

Over course of six months from 1st January 2023 to 30th June 2023, this randomized controlled trial was conducted at Ayub Teaching Hospital, Abbottabad. Patients who met the requirements for inclusion were included to the trial. Following Institutional Review Board (IRB) approval, a total of 70 patients undergoing modified radical mastectomy (MRM) who were in ASA one and two according to the American Society of Anesthesiologists (ASA) were randomly assigned to two equal groups.

The groups with and without PEC block (n=35) were subsequently reviewed. Patients' levels of post-operative discomfort were measured 6 and 12-hours after surgery. Regardless of age, all patients having a modified radical mastectomy had to meet the inclusion criteria. Written informed consent was taken from patients after being educated regarding study's purpose and benefits, and they were also given an explanation of the procedure. Age, residence, socio-economic status, education, occupation, and family history were all baseline demographic data collected from the patient.

The self-made structural questionnaire was used to gather all of the data. Software SPSS version 23 was used to analyze the data. After using the Shapiro-Wilk test to verify normality, the quantitative variable's mean±SD or median IQR was determined. For categorical variables, percentages and frequencies were determined. Post operative pain between two groups was compared by using chi square test. Statistical significance was defined as a P value of less than or equal to 0.05. In order to adjust possible effect modifiers, the data was stratified by age and BMI. At the 5% level of significance, post-stratification was used

Results:

In this study total 70-patients participated. The mean age and weight of the participants was 45.1714±7.0216 years and 59.6286 ± 7.37243kg respectively. The mean duration of cancer was 7.2143±4.286 month. Demographics are presented in Table I. Patients who received pectoral

Table 2:

		Pain after 6 hours			Pain after 12 hours				
		Pain	No pain	Total	P-value	Pain	No pain	Total	P-value
Pectoral block	patient who did not received pectoral block	35	0	35	<0.001	35	0	35	<0.001
	patients who received pectoral block	4	31	35		4	31	35	
Total		39	31	70		39	31	70	

Table 3: Pectoral block * pain intensity at 6 hours

	No pain	Mild pain	Moderate to severe	Very severe	Total
Patient who did not received pectoral block	0	0	25	10	35
Patients who received pectoral block	31	4	0	0	35
Total	31	4	25	10	70

Table 4: Pectoral block * pain intensity after 12 hours

	No pain	Mild pain	Moderate to severe	Very severe	Total
Patient who did not received pectoral block	0	0	0	35	35
Patients who received pectoral block	31	1	3	0	35
Total	31	1	3	35	70

block (n=35) and who did not receive pectoral block (n=35).

Among the 35 participants from PEC group 31 had no pain after 6 and 12 hours. 4 patients had mild pain after 6 hours and one had mild pain at 12 hours, 3 patient had moderate to severe pain at 12 hours. Among the other group who did not receive pectoral block, 25 patients had moderate to severe pain, 10 had very severe pain at 6 hours and all the 35 patients had very severe pain at 12 hours as demonstrated in table 3 and table 4.

Discussion:

This randomized control trial has shown that patients who have undergone breast surgery have found that pectoral block (PEC) is a helpful way to manage their postoperative pain. Research has shown that PEC can be successful in minimizing the consumption of opiates and pain scores.^{7,12-16}

In comparison to GA alone, PECS block and GA worked better in lowering, requirement for post-operative rescue analgesia, intraoperative and post-operative opioid intake, and post-operative early pain. Regardless of treatment type, about one-third of patients experience pain following breast cancer surgery, which negatively impacts their quality of life.⁹ previously most of the studies on PECS block were done preoperatively which give rise to questions like whether it is placed between muscles or fascial layers or within fascia as described by.¹⁰ Ultrasound guidance pecs blocks are responsible for development of hematoma.¹¹ The use of PEC without ultrasound guidance has been investigated recently. Our research adds to this body of evidence by showing that pain scores significantly decreased after 6 and 12 hours after surgery.

Kim et al. found that patients getting PEC without ultrasound guidance had lower pain scores and opioid consumption, which is consistent with our findings. In addition, research showed that landmark-based PEC successfully mitigated pain.¹² According to research, ultrasound-guided PEC, on the other hand, increases precision and effectiveness.^{4,7} Nevertheless, comparative research has produced contradictory findings. Limitation of this study is a single cantered study so further broader based and collaborative studies are necessary to validate our findings. No discernible change in pain levels between landmark-based and ultrasound-guided PEC was reported in studies.⁴ Limitations of this study is a single cantered study so further broader based and collaborative studies are necessary to validate our findings.

Conclusion:

In conclusion it has been demonstrated a significant reduction in postoperative pain scores in patient undergoing modified radical mastectomy with use of PEC block despite absence of ultrasound guidance than without use of PEC block. The findings suggest that PEC block without ultrasound guidance if performed by skilled surgeons can be effective and an emerging adjunct in pain management and overall improving surgical outcome. The helps particularly in

setting where ultrasound may not be easily available or to simplifying procedure. Further studies are recommended on large basis to assess long term outcomes of using pectoral block without use of ultrasound.

Integration with existing literature: The findings of our investigation support the body of research on PEC without ultrasound assistance, indicating that landmark-based methods can effectively relieve pain. The following factors may be responsible for PEC's success without ultrasound guidance:

1. Anatomical landmarks: Proper block placement is made possible by accurate identification of anatomical features.
2. Skilled operators: Without ultrasound guidance, competent practitioners can execute successful blocks.

Implications for clinical practice: Our study's findings support the use of PEC without ultrasound guidance as a viable option for post-operative pain management in breast surgery patients, particularly in resource-limited settings.

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Role and contribution of authors:

Shawana Asad, collected the data, references and did the initial writeup.

Sher Ali, critically review the article and made final changes.

Fawad Ahmad Khan, collected the data and helped in introduction writing.

Salma Ghaffar, collected the references and helped in discussion writing.

Hidayat, collected the data, references and helped in interpretation of data.

Ghazala Bhatti, went through the article and did

the useful changes.

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