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ORIGINAL ARTICLE

Analgesic Effect of Conventional Paravertebral versus Mid transverse Process to Pleura Blocks on Post Mastectomy Pain in Unilateral Modified Radical Mastectomy Surgeries

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ABSTRACT

Background: Moderately severe postoperative pain is linked to modified radical mastectomy (MRM). Acute postmastectomy pain can be effectively relieved by regional nerve block, which also lessens the frequency and intensity of chronic pain. Even though thoracic paravertebral block (TPVB) uses ultrasound, there is still a need to find a safer method. An additional localized method for postoperative analgesia is mid-transverse process to pleura block (MTPB). So, we aimed to evaluate analgesic effects of pleura blocks vs traditional paravertebral and mid-transverse process blocks in unilateral modified radical mastectomy procedures.

Methods: Hundred females who underwent modified radical mastectomy were randomized to receive either preoperative TPVB (group C), or MTPB (group M), both performed at (T3-T4) with 20 ml of bupivacaine 0.25%. The primary outcome was visual analogue pain score (VAS) in the post anesthesia care unit (PACU). The secondary outcome was onset and duration of the block, Total postoperative opioid consumption, time to first rescue analgesia and patients' satisfaction for 24 hours after surgery, then incidence of chronic pain after three and 6 months of surgery were recorded.

Results: There was a significant difference between the two groups regarding VAS, onset of the block, dermatomal spread in favor of TPVB group. While the intraoperative fentanyl consumption, postoperative pethidine consumption, time to first rescue analgesia, duration of the block, incidence of chronic pain, patient satisfaction was comparable between two groups.

Conclusions: MTPB provides good alternate to PVB despites better pain scores, higher dermatomal level and faster onset of block in favor of TPVB.

Keywords: Conventional Paravertebral, Mid transverse Process to Pleura Blocks, Post Mastectomy Pain, Unilateral Modified Radical Mastectomy.

INTRODUCTION

Breast cancer is an international health issue that has a big effect on women's health. The incidence and mortality of breast cancer have changed during the last few decades on a global scale. Epidemiological data also show clear demographic and regional differences around the world. According to latest global cancer data, breast cancer now accounts for 11.7% of new cancer cases in 2020, surpassing lung cancer as the most common disease diagnosed globally. Breast cancer is still a major worldwide health concern as a result [1].

The goal of a modified radical mastectomy (MRM) is to remove the entire breast, leaving the pectoralis major muscle intact, along with the skin, areola, nipple, and most axillary lymph nodes [2]. About 60% of people who get a mastectomy with

reconstruction report having excruciating pain right after the procedure. Nonetheless, there is a higher chance of long-term chronic discomfort in situations including mastectomy and axillary lymph node dissection [3, 4]

Following breast and axillary surgery, most patients report experiencing acute pain in the arm, shoulder, armpit, and chest. If left untreated, this can lead to chronic shoulder pain and restricted shoulder range of motion, which can ultimately impact the general health of breast cancer survivors [5]. A form of chronic pain that affects the anterior thorax, axilla, and/or medial upper arm and persists past the three-month healing period following mastectomy is known as post-mastectomy pain syndrome. Around the surgical side, it is typically described as a searing, stabbing, and pulling sensation. This illness, which follows surgical therapy for breast cancer, is categorized as a neuropathic ailment. To treat immediate post-mastectomy pain, peripheral nerve block approaches have been proposed in addition to conventional opioid and non-opioid analgesics [6].

By lowering the incidence of post-mastectomy pain, reducing the need for opioids, and minimizing postoperative nausea and vomiting, regional blocks combined with general anesthesia are an effective way to manage pain related to breast surgery [7].

Injecting local anesthetics close to the dorsal ramus causes TPVB's pain-relieving effects, which then spread to the sympathetic chain and ventral ramus. For carrying out TPVB, numerous methods and strategies have been put forth [8]. Furthermore, performing these procedures on obese patients might be challenging, even with the use of ultrasound. To solve these issues, newer blocks and alternative techniques with fewer inherent hazards have been created. There have been reports of several methods that use injections outside of the thoracic paravertebral region. Paravertebral by proxy is a procedure that blocks the thoracic nerve roots in this region using the retrolaminar, intercostal/paraspinal, erector spinae plane, and MTPB planes without actually inserting the block needle into the paravertebral space [9]. A more recent end-point for thoracic paravertebral block is MTPB. Between the pleura and the transverse process, local anesthetic is applied. Due to its close closeness to the pleura, the traditional method of doing PVB is more likely to result in difficulties[10].

Comparing post-operative pain scores as the primary outcome and dermatomal coverage and duration of both blocks, time to first rescue analgesia, total amount of opioid required in the first 24 postoperative hours, and incidence of chronic pain as secondary outcomes were the goals of this study.

METHODS

This prospective controlled randomized triple blinded clinical trial was conducted in Zagazig University Hospitals in Anesthesia, Intensive care and Pain management Department on the duration between November 2023 to September 2024 after obtaining institutional review board approval from the Medical Ethic Committee (IRB no.: 11309-26-11-2023). Our study included 100 patients, were randomized by computer-generated randomization table according to the block technique into two groups and received either pre-operative conventional TPVB (50 patients) (Group C) or preoperative MTPB (Group M)—with general anesthesia.

The study comprised patients who were ASA I or II, had a BMI of less than 30 kg/m2, were undergoing unilateral MRM operations, and were between the ages of 21 and 65. Patients with a history of mental illness, coagulation disorders, prior neurological deficits, persistent pain, known drug allergies, block site infections, or metastases were excluded from the trial.

Preoperative:

As part of their preoperative preparation, every participating patient underwent a preoperative examination. The study's objectives, methods, and outcomes were explained. Informed consent was obtained orally and in writing. Vital indicators (heart rate [HR], mean arterial pressure [MAP], oxygen saturation [SPO2]), as well as cardiac and chest conditions, were carefully recorded during the physical examination. Every patient was investigated for coagulation profile, liver function test, kidney function test, and complete blood count. Prior to the procedure, all patients were required to fast for two hours for clear fluids and six hours for solid food.

During the preoperative appointment, the 10-centimeter visual analog scale (VAS) was explained, with 0 representing no pain, 1-3 mild, 4-6 moderate, and 7-10 severe [11]. In a fully equipped block room, the block technique was performed prior to surgery. Standard monitors such as non-invasive blood pressure (NIBP), electrocardiography (ECG), and pulse oximetry were connected when patients arrived at the block room. Prior to block, baseline

data was recorded as HR, MAP, and SpO2. Intravenous fluid infusion began when an 18-gauge I.V. cannula was inserted in the other hand. Using a face mask, oxygen was given at a rate of 4 L/min. Midazolam 0.03 to 0.04 mg/kg was administered intravenously for procedural sedation.

Technique:

While the patient was seated, sterile preparation was carried out at the needle insertion site. As illustrated in fig (1S), the Sonoscape A6T US device's superficial high frequency linear probe with K-Y gel was positioned 3–4 cm parasagittally at the back in the cephalad-caudal direction at the T3–T4 transverse process on the operative side. The first bony landmark at the spine is C7, after which the US probe is positioned parallel at its level and moved downward until it reaches the transverse process of T3. The hyperechoic structures known as the superior costotransverse ligament (SCTL) and parietal pleura were identified; the latter is more hyperechoic, parallel to the skin, and moves with deep inspiration. Then, using a 24 G hypodermic needle and 2% lidocaine, the skin was infiltrated;

1. In Conventional thoracic PVB:

The 22-gauge, 80 mm needle (B-Braun, Germany) was inserted in the parasagittal plane until the tip punctured the SCTL. The anesthetic agent was given gradually once the needle position was confirmed. 20 ml of 0.25% bupivacaine + 50 µg dexmedetomidine (0.5 ml) + 250 mg magnesium sulphate (2.5 ml) were injected. (figure 1S, 2S).

2. In Mid transverse process to pleura block:

The 22-gauge, 80 mm needle (B-Braun, Germany) was inserted in the parasagittal plane until the tip was between the pleura (superficial to the SCTL) and the midpoint of the posterior border of the transverse process. The anesthetic agent was given gradually once the needle tip was confirmed. 20 ml of 0.25% bupivacaine + 50 µg dexmedetomidine (0.5 ml) + 250 mg magnesium sulphate (2.5 ml) were injected fig (3S).

In both groups, the following parameters were measured: total block performance time (from probe scan to end of LA injection), time to obtain maximal block level, and onset of the block (defined as the time from local anesthetic injection till loss of cold feeling in desired dermatomes (T1-T6).

Intraoperative:

Standard monitoring, which comprised pulse oximetry, ECG, and [NIBP], was attached when the patient arrived in the surgery room. Every patient in both groups had general anesthesia. Anesthesia was induced by intravenous administration of fentanyl 1 µg/kg, propofol 2 mg/kg, and cisatracurium 0.15 mg/kg to permit endotracheal intubation with appropriate size of endotracheal tube after three minutes of pre-oxygenation with 100% oxygen. The volume-controlled mode of ventilation was used to maintain normocapnia ($EtCO_2$ = 35–45 mmHg). An O2-air mixture containing 1.1–1.4 MAC of isoflurane was used as the inhalational agent. Prior to induction and continually during the procedure, HR, MAP, and SpO_2 were measured. They were recorded every 10 minutes for the first 30 minutes of the procedure and subsequently every 15 minutes until the finish.

After ruling out other reasons, tachycardia (HR > 20% from baseline) and hypertension (MAP > 20% from baseline) were used to indicate inadequate analgesia, and incremental doses of fentanyl (0.5µg/kg) were administered. The total amount of fentanyl consumed during surgery was determined. One gram of paracetamol is infused intravenously into the patient. After stopping the inhalational anesthetic at the completion of the procedure, the patient was given atropine sulphate (0.01 mg/kg) and neostigmine (0.05 mg/kg), and their airway was suctioned and extubated. The patient was moved to the post-anesthesia care unit (PACU) once they had recovered from anesthesia.

Postoperative:

For the first hour after arriving at the post-anesthesia care unit (PACU) vital signs (HR, MAP, and SpO2) were taken every 15 minutes, then at 2, 4, 6, 8, 12, and 24 postoperative hours, in the ward. As a conventional analgesic, all patients received an intravenous infusion of paracetamol at a rate of 15 mg/kg every 8 hours, with a daily maximum of 4 g.

At 2, 4, 8, 12, 18, and 24-hours following surgery, an observer who was blind to the treatment groups used the visual analogue scale (VAS) to measure and record pain (0 being no pain, 1 to 3 being light pain, 4 to 6 being moderate pain, and 7 to 10 being severe pain). The patient was given pethidine (20 mg) intravenously gradually as a rescue analgesic if their pain level was more than 3 on the VAS scale.

The time to first rescue analgesia (the period of time from the block's onset until the patient requested analgesia or if VAS was greater than 3), total postoperative pethidine consumption, duration of the sensory block (interval between the start of the block and the affected dermatomes' return to sensation) were noted. Ondansetron 4 mg IV was used to treat post-operative nausea and vomiting, which will be measured using a PONV impact scale

[12], with 0 representing none, 1 mild, 2 moderate, and 3 severe. A satisfaction score (4 = outstanding, 3 = good, 2 = fair, and 1 = bad) was used to gauge patient satisfaction after surgery [13]. Complications and adverse effects, such as block failure (failure of loss of sensation in all desired dermatomes after 30 min), intramuscular hematoma, pleural puncture, sedation, and respiratory depression, were noted and documented if they had happened with appropriate care.

Incidence of Chronic Pain Development: Postoperative Follow-Up (3 and 6 Months). At three- and six-months following surgery, patients received a phone call. For analgesia, all patients were advised to take 10 mg/kg of ibuprofen and 1 g of acetaminophen three times in case of persistent pain after discharge from hospital. Tramadol 50–100 mg was an option for analgesia (in pain clinic after consulting pain consultant). In the event that they did not receive appropriate pain relief, the patients were asked to call the research physician. Three criteria used to determine chronic pain: the nature, location, and timing of the pain. To guarantee comparability, the same post mastectomy pain syndrome (PMPS) criteria were applied at both time points. Neuropathic pain features, such as numbness, pins and needles, burning, or stabbing, were evaluated. The location of pain was noted as either the ipsilateral arm, the chest wall, the axilla, or the same side of the procedure. The term "timing of pain" refers to discomfort that lasts longer than the typical three-month healing period, either continuously or intermittently [14]. All telephone interviews were conducted by a blinded study assistant. In addition to being questioned if they were now taking analgesics, the patients were also asked if they had ever received chemotherapy or radiation therapy, as well as how often and when. Researchers, statisticians, and patients were all blind to the assigned group.

Sample size:

Assuming the VAS was 0.56±0.6 vs 0.94±0.7 in conventional PVB vs mid-transverse to pleura block [10]. At 80% power and 95% CI, the estimated sample was 100 cases, 50 in each group, 10% of cases were added to compensate for dropout using open EPI program.

Statistical Analysis:

SPSS version 16 was used for data processing, including data entry, verification, and analysis. The outcomes of the current research were analyzed using the following statistical techniques: The Mann Whitney test was used to determine the difference between quantitative variables in data that was not normally distributed in two groups; the Fisher exact test was used instead of the standard chi-square test in cases of non-parametric data; the student "t" test was used to compare the means of two independent groups; and the chi-square test (X2) was used to determine the relationship between row and column variables.

RESULTS

Between November 2023 and September 2024, 118 patients planned to have modified radical mastectomy surgery at Zagazig university hospitals were included. After 18 patients failed to meet the inclusion criteria, the remaining 110 patients were divided into two groups at random, 10 of them were excluded from further follow-up and analysis and 100 patients (50 in each group) finished the trial. Regarding age (P value=0.757), BMI (P value=0.672), ASA (P value=0.585), operating side (P value=0.534), and surgical time (P value=0.413), there were no statistically significant differences between the groups under study, as indicated in table(1).

In terms of block duration (p value=0.154) and maximum sensory block level at (T2, T3, T4, & T5), there was no statistically significant difference between the groups under study, as indicated in table (2). However, group C exhibited a faster onset of block, indicating a statistically significant difference (P value<0.001) between the groups under study as indicated in table (2). Group M needed longer time than group C to achieve the maximum sensory block level, indicating a statistically significant difference (P value<0.001) between the groups under study as indicated in table (2). At T1 and T6, the paravertebral group displayed a better dermatomal spread than the midpoint to transverse process block group. Comparing group C to the other group, the former displayed a statistically significant longer total block performancetimeTable(2).

Figure (1) illustrates that there was a statistically significant difference (P value<0.001) in the postoperative VAS pain scale scores between the groups under study after 4, 8, 12, 18, and 24 hours, with group M displaying higher postoperative VAS score.

The time to initial rescue analgesia (p=0.381), total intraoperative fentanyl (p=0.205), and total pethidine use (p=0.324) in the first 24 hours did not differ statistically significantly between the groups under study (Table 3).

Figures 5S and 6S demonstrate that there was no statistically significant change in mean arterial pressure or intraoperative heart rate data between the groups under study. Regarding post-operative MAP and HR, respectively, there was no statistically significant difference between the groups under study (figures 7Sand8S).

Figure 2-4 illustrates that, in terms of the incidence of chronicity, patient satisfaction, and PONV in both groups, respectively, there was no statistically significant difference between the groups under study.

Table 1: Patients demographic and surgical data, in the two studied groups.

Variable		Group C (n=50)		Group M (n=50)		Tests	
						T	***P* value**
Age (years) Mean± SD		49.76±5.09		50.1±5.85		-0.310	0.757
BMI (kg/m^2) Mean± SD		28.17±1.25		28.08±0.98		0.424	0.672
Surgery duration (min) Mean± SD		107±9.67		108.5±8.53		-0.823	0.413
		No.	%	No.	%	x^2	
ASA	I	43	86	41	82	0.298	0.585
	II	7	14	9	18		
Operative side	Right	33	66	30	60	0.386	0.534
	Left	17	34	20	40		

Data were expressed as mean ± standard deviation (SD), number (n), percentage (%), ASA: American society of anesthesiologists, BMI: body mass index, ASA: American society of anesthesiologists, BMI: body mass index, (t) Independent sample t test & Chi square test (x^2).

Table 2: onset (min) and duration of block (h), maximum sensory block level, Total block performance time (min) and Surgery duration (min) in the two studied groups.

Variable		Group C (n=50)		Group M (n=50)		Tests	
						t	***P* value**
Onset of block(min) Mean± SD		17.26±1.78		21.16±2.69		-8.545	<0.001*
Time to reach max block level(min) Mean± SD		24.6±3.28		33.74±4.86		-11.013	<0.001*
Duration of block(h) Mean± SD		16.5±1.07		16.16±1.28		1.437	0.154
Sensory block level							
		No.	%	No.	%	x^2	P value
T1	not reached	9	18	24	48	10.176	0.001*
	Reached	41	82	26	52		
T2	Reached	50	100	50	100	----	---
T3	Reached	50	100	50	100	-----	---
T4	Reached	50	100	50	100	----	----
T5	Reached	50	100	50	100	----	-----
T6	not reached	9	18	24	48	10.176	0.001*
	Reached	41	82	26	52		
Total block performance time (min) Mean± SD		14.36±1.84		12.78±1.39		4.849	<0.001*

Data were expressed as mean ± standard deviation (SD), number (n), Percentage (%), (t) Independent sample t test, Chi square test (x^2), Group (C)= Conventional thoracic Paravertebral block & Group (M)= Mid transverse Process to pleura

Table ٣: Total intraoperative fentanyl (µg) and postoperative pethidine consumption in the first 24 postoperative hours (mg) within the studied groups.

Variable	Group C (n=50)	Group M (n=50)	Tests	
			Z	*P* value
Total intraoperative fentanyl (µg) Mean± SD Median (IQR)	 64±20.2 50 (50-80)	 73.7±31.47 50 (50-111.25)	-1.268	0.205
Total postoperative pethidine consumption in the first 24 hours (mg) Mean± SD Median (IQR)	 41.2±14.23 40 (40-60)	 44±13.4 40 (40-60)	-0.986	0.324
Time to first rescue analgesia (min) Mean± SD Median (IQR)	 792.2±67.27 800 (760-880)	 792.2±64.15 775 (740-835)	-0.877	0.381

Data were represented as mean± SD, Median (IQR) (z) Mann Whitney test, (X^2) Chi-Square Tests, Group (C)= Conventional thoracic Paravertebral block & Group (M)= Mid transverse Process to pleura

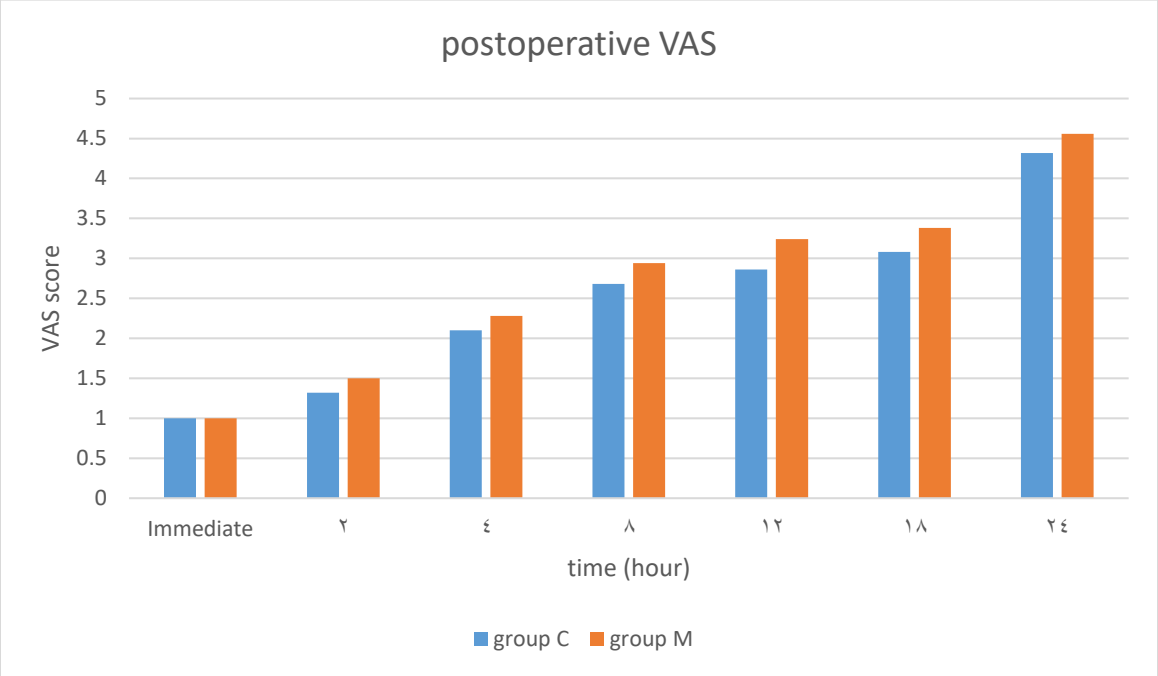

Figure 1: Bar chart illustrating postoperative VAS pain scale after (4,8,12,18&24)hours between two studied groups.

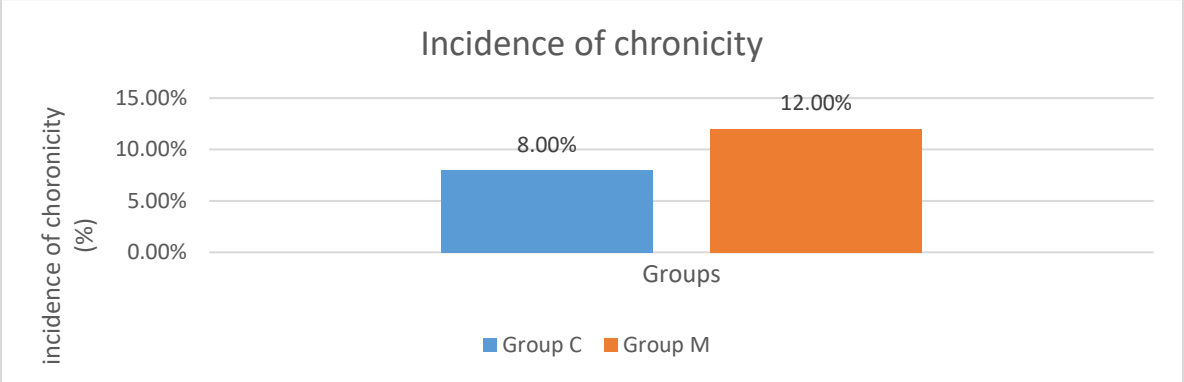

Figure 2: Bar chart illustrating incidence of chronicity between two studied groups.

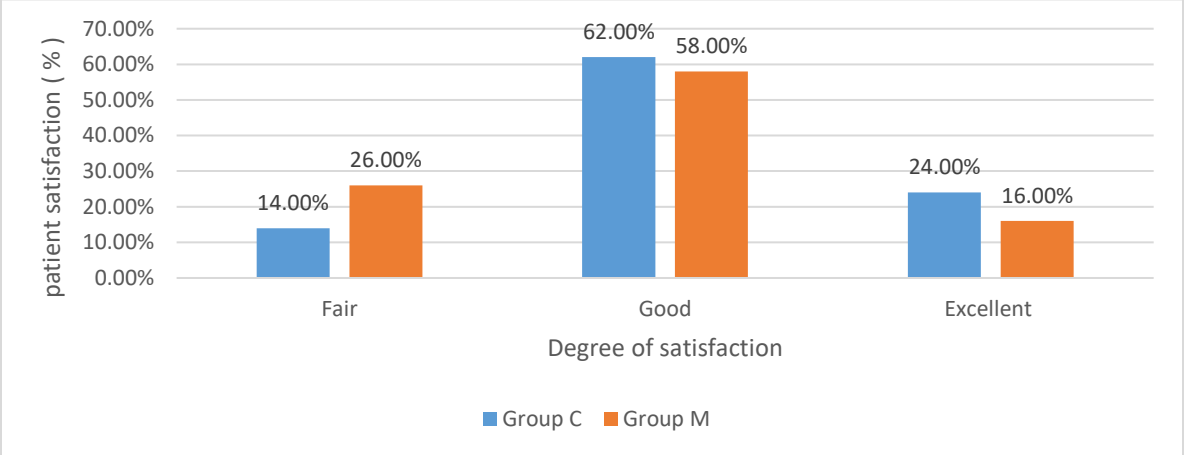

Figure 3: Bar chart illustrating patients' satisfaction between two studied groups.

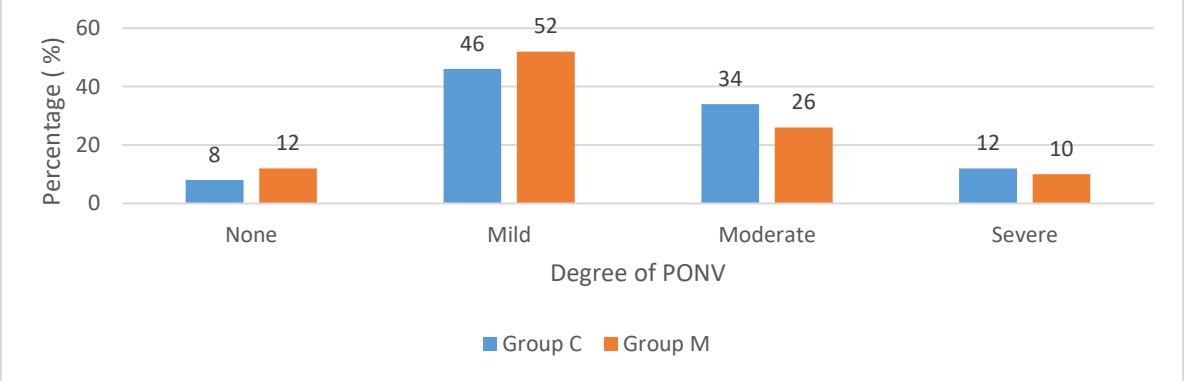

Figure 4: Bar chart illustrating PONV degree between two studied groups.

DISCUSSION

Modified radical mastectomy (MRM) is associated with postoperative discomfort, and in almost half of instances, if the acute pain is not properly controlled, it might develop into chronic pain. Moderate to severe discomfort is reported by 24% of patients [15].

The current study showed that TPVB was superior in terms of faster onset, higher dermatomal spread, and lower pain levels. While the outcomes of both blocks (TPVB and MTPB) were similar in terms of total postoperative pethidine intake, block duration, hemodynamics, patient satisfaction, and the likelihood of developing chronic pain, this could make MTPB a viable substitute for TPVB. It also has a quick performance duration and is safe.

Swathi et al. [10] evaluated the analgesic effectiveness of pleura (MTP) blocks in video

assisted thoracoscopic surgeries (VATS) versus traditional paravertebral and mid-transverse process blocks. According to their findings, the two approaches were comparable in terms of patient satisfaction ratings, dermatomal level of block, analgesic intake during the first 24 hours, and VAS scores. The disparity between this study and ours could be due to the small sample size and the various surgical procedures. Additionally, in the Swathi study, they evaluated sensory loss 30 minutes after a local anesthetic injection, and six hours following surgery, the anesthetized dermatomes were evaluated. Furthermore, their study's use of a catheter for continuous infusion may have contributed to the prolonged time of performance.

The two approaches in the current investigation differed significantly in terms of when the block started and how long it took to achieve the highest sensory level. In contrast to the MTP group, the traditional PVB group showed a quicker onset. In order to improve craniocaudal dissemination along the thoracic nerves, the local anesthetic was directly deposited in the paravertebral region instead of being injected superficially to SCTL. A larger percentage of patients achieving T1 and T6 levels (82% vs. 52%, p=0.001) may indicate a higher dermatomal spread.

Some of the ways that MTP injections, which were posterior to the SCTL, may reach the paravertebral space. medial to the SCTL through the gap between the SCTL and vertebral bodies; lateral to the SCTL through the internal intercostal membrane; and spread deep to the erector spinae muscles, through the intercostal muscles, and into the intercostal space. Paravertebral spread may occur without pleural displacement [9]. As a result, the drug's distribution within the MTP block might not be consistent, which could result in less effective analgesiathanPVB.

There is disagreement about the precise mechanism or mechanisms underlying intertransverse process (ITP) blocks, which were proposed as a name to include the midpoint transverse process to pleura and its successors. Thus, in a cadaveric model, Varela et al. [16] sought to assess the distribution of local anesthetic (LA) after erector spinae plane (ESP) and ITP blocks in comparison to paravertebral (PV) blocks. They found that after ITP blocks, local anesthetic spreads into the erector spine fascial plane as well as the PV region, perhaps providing a better analgesic profile than ESP blocks.

Scimia et al. [17] found that the MTPB might be a potential substitute for the traditional regional techniques as PVB, particularly in high-risk patients or when these blocks are contraindicated. They also obtained a sensory block in T3-T7 dermatomes on the operative side and good quality analgesia after VATS in a patient with adenocarcinoma of the right lower lobe.

Sethi et al. [18] discovered that during MRM procedures, erector spinae plane block (ESP) caused less pain than MTPB. They clarified that in MTPB, the drug is applied superficially to the superior costotransverse ligament, resulting in a varied spread in the paravertebral region and erector spinae plane. Compared to the erector spinae plane block, which has a broad cranial-caudal spread of the local anesthetic drug, the MTPB may be less successful at relieving pain because of this uneven spread.

Additionally, it has been discovered that the MTPB is a safe and efficient analgesic technique for medical thoracoscopy [19].

In consistent with the current study, Russo et al. [20] said that in patients undergoing lobectomy procedures, the analgesic efficacy and local anesthetic distribution of TPVB appear to be better than those of MTPB.

The findings of Fenta et al. [21], who likewise found reduced pain scores with PVB compared to fascial plane blocks like ESP in thoracic surgery patients, are consistent with PVB's higher analgesic efficacy.

When comparing between the two groups (TPVB and MTPB groups) in lobectomy surgeries, both techniques in our study produced comparable hemodynamic stability during the intraoperative and postoperative periods, which was consistent with Russo and colleagues [20]. They attributed this to a lesser sympathetic block that occurs in unilateral block.

Forero et al. [22] pointed out in their meta-analysis that one of the main benefits of regional anesthetic treatments over general anesthesia alone for thoracic surgeries is this hemodynamic stability. In their study of PVB in thoracic surgery, D'Ercole et al. [23] found that, in contrast to thoracic epidural, hypotension is rare following TPVB in normovolemic patients due to unilateral sympathetic blocking.

Furthermore, TPVB was investigated by Parikh et al. [24] in managing postoperative pain in individuals who had autologous breast reconstruction following mastectomy. They found that in the 24 hours following surgery, individuals

who received a TPVB had a considerable improvement in pain management.

A randomized double-blind trial by Syal and Chandel, [25] evaluated the three most common analgesia techniques after MRM with axillary dissection and found that the thoracic PVB (TPVB) group fared better than the pectoralis (PECT) and LA infiltration groups in terms of duration of analgesia, post-operative VAS scores, and reduced intake of rescue analgesics for up to 24 hours. ($P < 0.01$).

Neither the overall intraoperative fentanyl consumption nor the postoperative pethidine requirement varied significantly, according to our investigation. Furthermore, the time to first rescue analgesia did not differ statistically significantly among the groups under study. This finding is somewhat unexpected and could indicate that although PVB produced better analgesia as determined by VAS scores, this difference might not result in clinically significant decreases in opioid consumption. This could be because both groups' pain scores were lower than those required to request analgesics (>3) up to eight hours after surgery.

The incidence of chronic pain did not significantly differ between the two groups in our study (8% in PVB vs. 12% in MTP, p=0.505). This data implies that both approaches may provide similar protection against the onset of chronic post-surgical pain, even though our study was not particularly designed to identify differences in chronic pain outcomes.

Similarly, Qian et al. [26] found that at three and six months after surgery, ropivacaine-guided perioperative ultrasound-guided TPVBs reduced postmastectomy chronic pain and improved acute postoperative pain.

Although the precise origin of PMPS is unknown, a number of etiological explanations have been proposed, such as pain from neuromas, intraoperative injury to axillary nerve pathways, and dissection of the intercostobrachial nerve [27].

Lin et al. [28] showed that multilayer single-shot PVB improves early postoperative analgesia, lowers neuropathic pain at six and twelve months after surgery, and lowers the incidence of CPSP at six months for patients having breast cancer surgery.

In line with previous research, the current investigation found no discernible difference in patient satisfaction between the two groups [10, 29]. In both groups, most patients gave their experience a "Good" or "Excellent" rating (86% in PVB vs. 74% in MTP). Good pain management, decrease PONV, and a manageable block can all help to explain this.

Patients with PVB had a decreased incidence of postoperative discomfort, PONV, and other significant sequelae, according to Arunakul and Ruksa [30]. In their investigation, no patient expressed dissatisfaction with the anesthetic methods.

In our study there were no complications discovered or mentioned by patients. This outcome may be attributed to skillful anesthesiologists using ultrasonography, appropriate preparation, and the selection of patients.

Despite the low rate of technical failure in TPVB execution (6.1%), Naja and Lönnqvist [31] discovered that pulmonary consequences, including pneumothorax (0.5%) and unintentional pleural puncture (0.8%), are still a known concern even with the ultrasound-guided technique. Unintentional arterial puncture (6.8%), hematoma (2.4%), skin puncture site pain (1.3%), and indications of intrathecal or epidural dissemination (1.0%) are a few more risks. In this case, Naja and Lönnqvist gathered information on 620 adults and 42 children who got PVB for a variety of reasons; therefore, as the sample size grows, difficulties may be found in other populations.

To confirm these results and investigate the safety and consequences of MTPB as a novel paravertebral via proxy, as well as its effectiveness in lowering chronic postmastectomy pain syndrome, more research with a larger sample size is required.

Conclusions

In patients undergoing unilateral MRM surgery, both traditional paravertebral block and mid-transverse process to pleura block are efficient methods for delivering analgesia (as measured by opioid consumption, and time to first rescue analgesia). Additionally, there were benefits to the traditional thoracic paravertebral block, including a quicker onset, greater dermatomal distribution, and a lower postoperative pain score. Nevertheless, neither patient satisfaction nor overall pethidine intake were changed much as a result of these advantages.

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Conflict of interest

The authors declare that they have no conflicts of interest with respect to authorship or publication of this article

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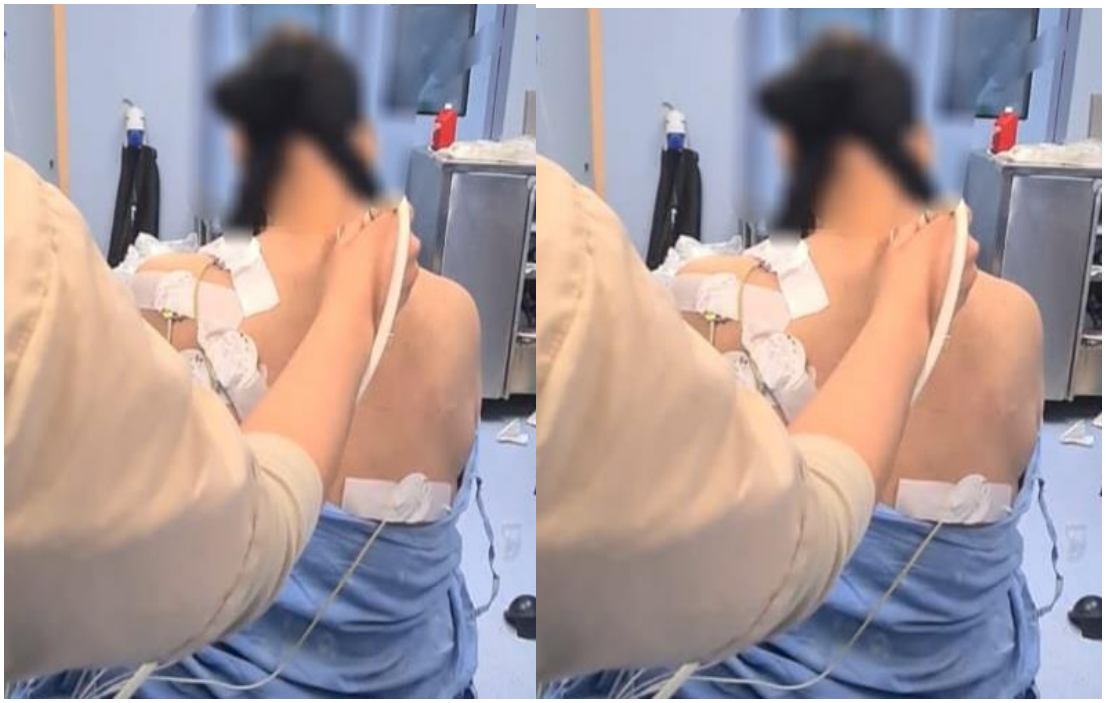

Figure 1S: locating site of needle insertion.

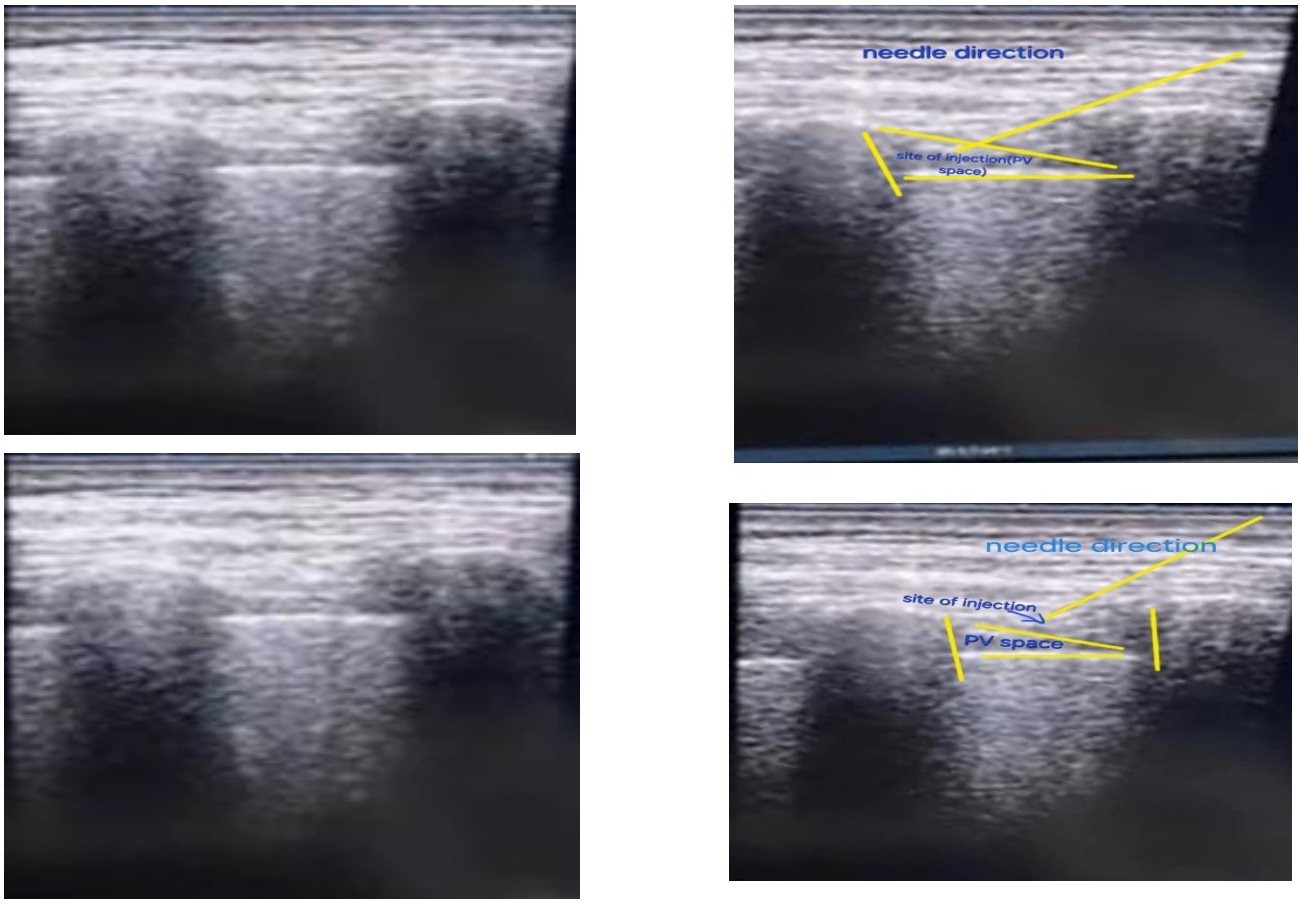

Figure 2S: stages of performing conventional PVB.

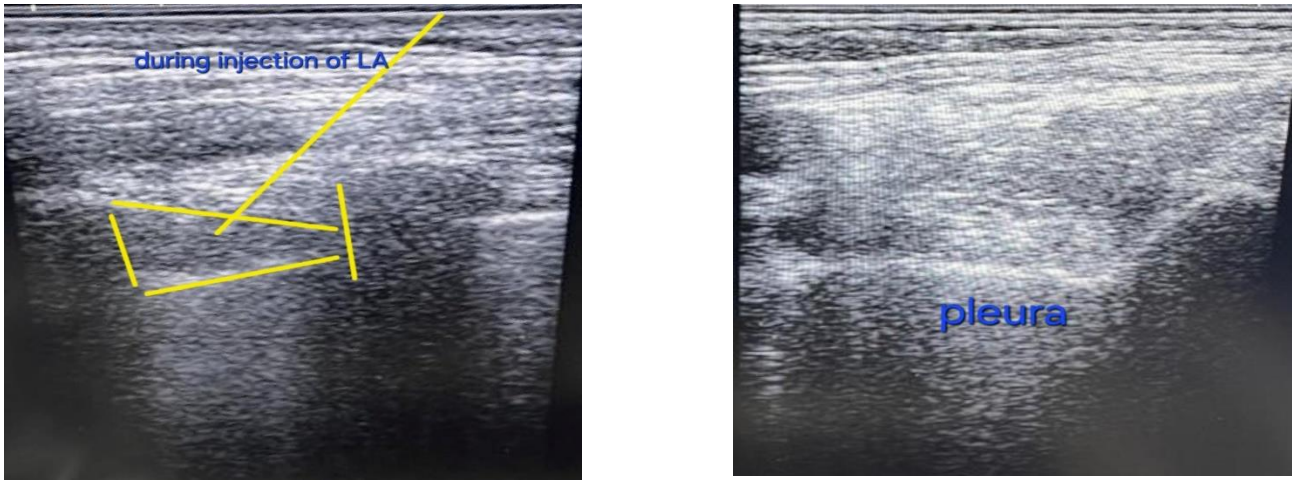

figure 3S: performing MTPB

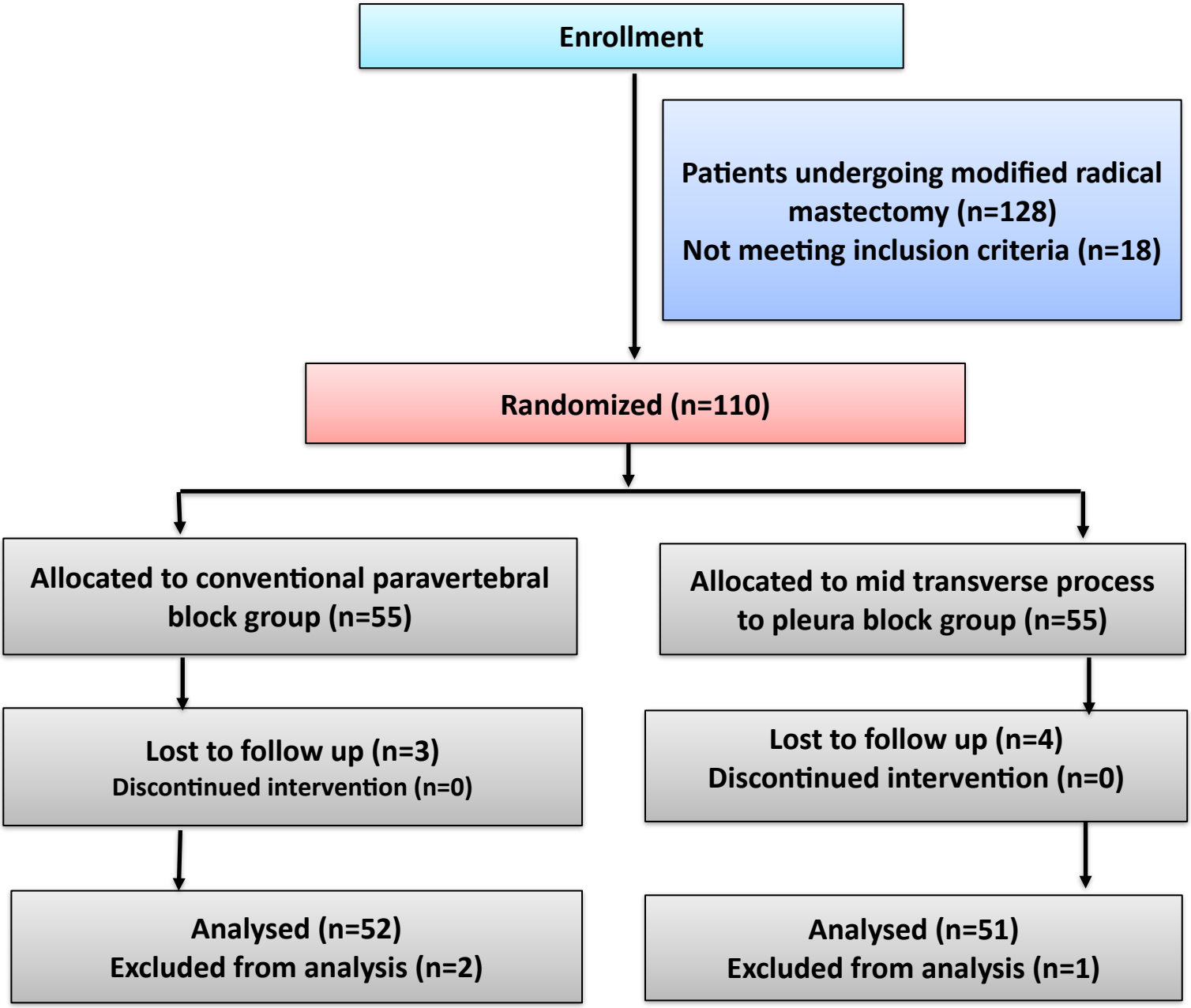

Figure 4S: Study flow chart (CONSORT)

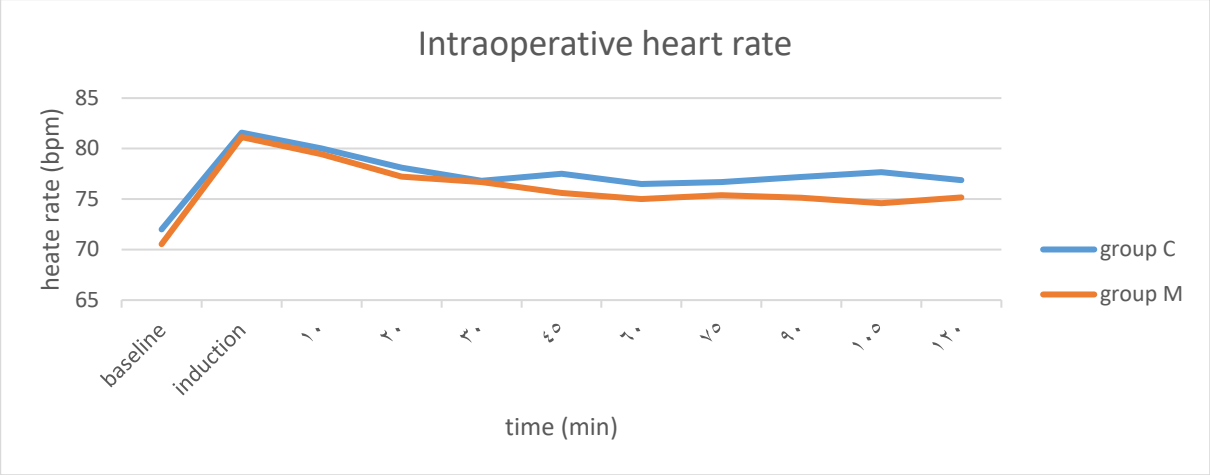

Figure 5S: Patient`s intraoperative HR within studied groups.

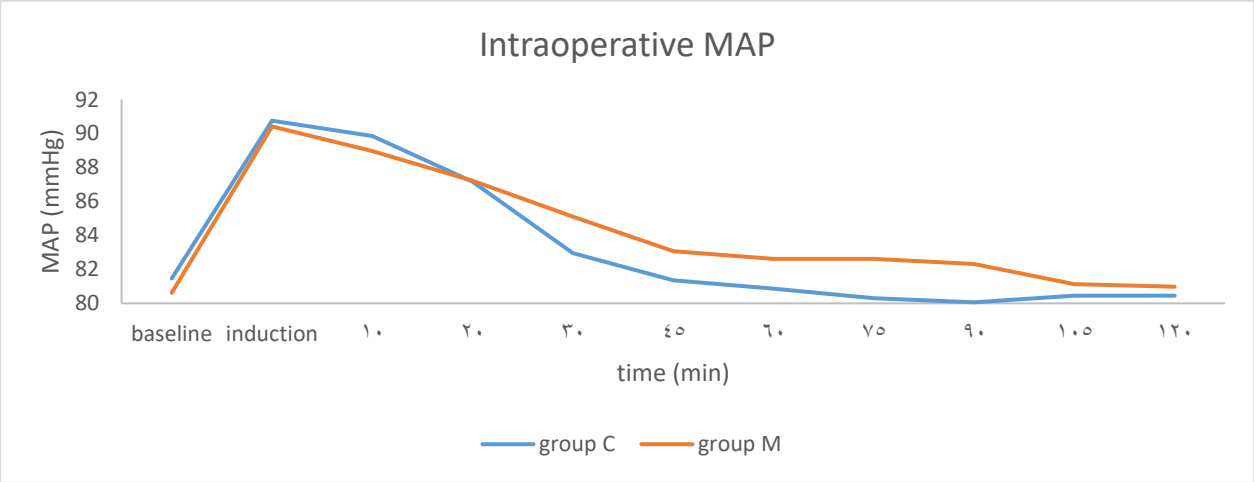

Figure 6S: Patients intraoperative MAP within studied groups.

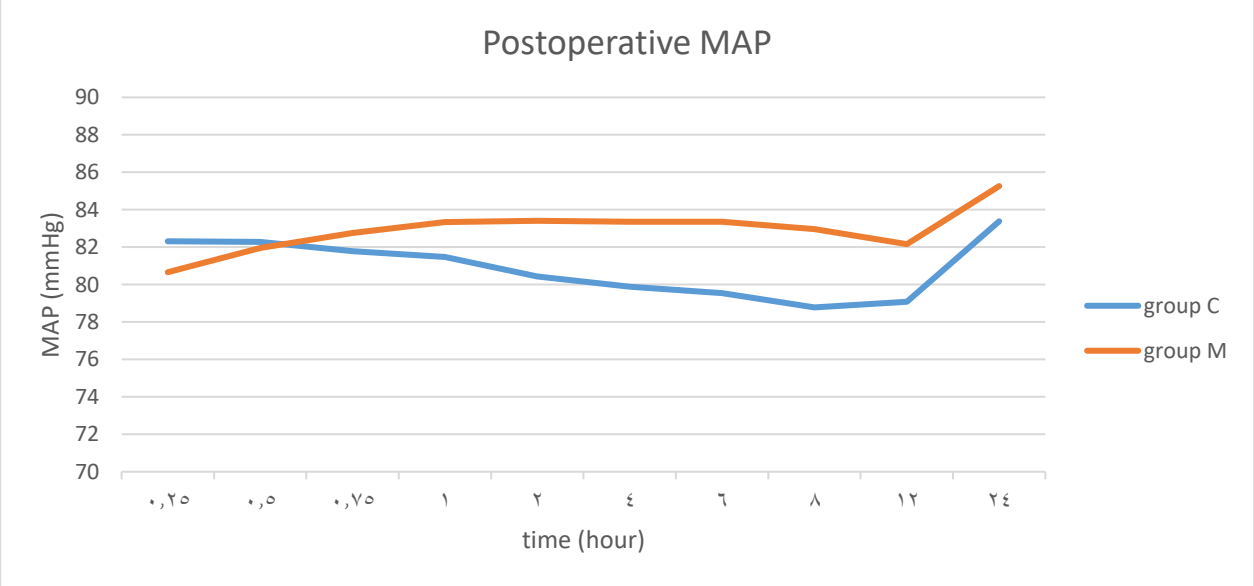

Figure 7S: Patients postoperative MAP within studied groups.

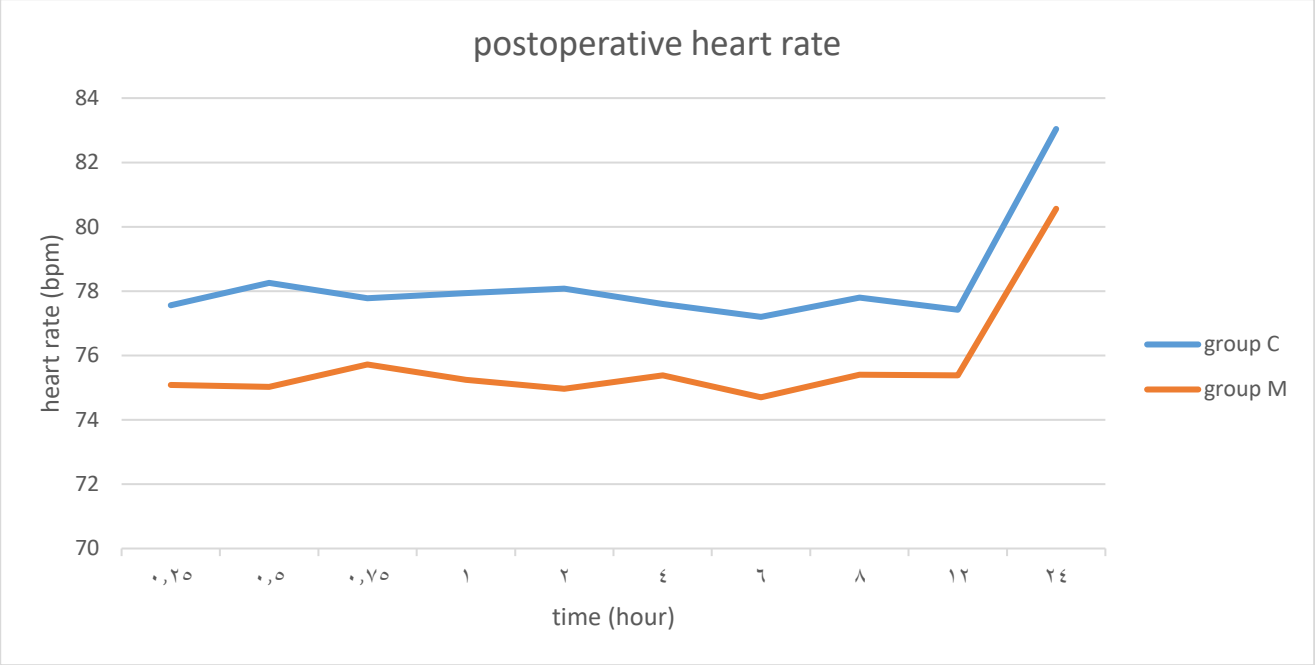

Figure 8S: Patients postoperative HR within studied groups.

Citation

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