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Evaluation of Pectoral Nerve Blocks Type II (PEC II) for Augmentation Mammoplasty: Prospective, Randomized, and Double-Blind Study

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Abstract: Objective: to study the effectiveness of type II pectoral nerve block (PEC II) for breast augmentation with submuscular implants by assessing opioid consumption and pain scale in the immediate postoperative period, from the post-anesthesia care unit (PACU) to 24 h postoperatively. Methods: A prospective, controlled, randomized, and double-blind study. Thirty-four patients were analyzed during the perioperative period and in the PACU, with one group receiving bilateral PEC II combined with general anesthesia and the control group receiving only general anesthesia. Results: There was no difference between the groups regarding demographic data, surgical and anesthetic times, or intraoperative opioid use. Opioid consumption in the control group was consistently higher at all the time intervals studied, with an average morphine consumption 38.7% greater. The largest variation in morphine consumption occurred at the fourth and sixth hours postoperatively. The greatest difference in postoperative pain was 36% higher in the control group compared to the intervention group. Conclusions: patients who underwent general anesthesia combined with PEC II had lower opioid consumption and a lower postoperative pain score without associated complications, confirming the effectiveness of the procedure.

Keywords: regional anesthesia; pectoral nerve block; PEC II; pain

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1. Introduction

Postoperative pain after breast surgery is a complex problem and is one of the main complications [1]; breast augmentation procedures can lead to significant postoperative pain, nausea, and vomiting, and may be associated with wound dehiscence and a longer hospital stay [2]. In order to combat pain and provide adequate postoperative analgesia, perioperative optimization strategies recommend anesthesia and opioid-sparing multimodal analgesia. Paths to optimizing recovery seek to reduce the endocrine–metabolic response, facilitating recovery [3,4].

The opioid-sparing strategy involves the use of multiple simultaneous pain control mechanisms, acting synergistically to improve the analgesic effect and reduce doses of any single agent to minimize the risks of side effects [5]. Optimization initiatives encompass

a sequence of perioperative measures based on the literature, with the aim of benefiting the patient with better outcomes at the end of treatment [6]. Therefore, these strategies are increasingly included in perioperative recovery protocols [7].

Analgesia is a critical component of optimizing postoperative recovery [8]. Regional anesthesia, as an anesthetic subspecialty, is in a privileged position to lead the changes that will impact the opioid-sparing technique [9]. This is because regional anesthesia attenuates or blocks nociceptive stimuli, which make up the pillars of surgical stress [8,10]. That said, it prevents perioperative pain by modulating the pain signaling created by the surgical stimulus [11].

The present study aims to investigate the real value of blocking of the chest wall in postoperative analgesia in this population. If successful, it is believed that it is possible to present type II PEC blocks as an additional tool for performing opioid-sparing multimodal analgesia.

2. Objective

Based on literature data, the objective of this study was to evaluate whether general anesthesia associated with PEC II block provides better postoperative analgesia and lower postoperative opioid consumption compared to general anesthesia without block for patients submitted to breast augmentation surgeries, without presenting a higher incidence of complications compared to general anesthesia without block.

The guiding question for this randomized clinical trial was whether general anesthesia combined with a PEC II block provides better postoperative analgesia compared to general anesthesia alone in patients undergoing breast augmentation surgery.

3. Technique Review

Pectoral Nerve Block

The modern practice of regional anesthesia has been revolutionized by ultrasound: "if you can see it, now you can block it". Although the total number of regional anesthesia techniques described in the ultrasound era increased, no subset has grown as rapidly as interfacial plane blocks in thoracic and abdominal walls [12]. Fascial plane blocks are a class of regional anesthesia techniques, distinguished by the fact that the target of needle insertion and local anesthetic injection is a compartment between two anatomically separate layers of fascia, and is not an attempt to localize individual nerves. However, the ultimate objective remains the blockade of afferent nociceptive transmission [13].

This is not a new concept: long-established techniques such as landmark-guided ilioinguinal–iliohypogastric and fascia iliaca blocks fall under fascial blocks. However, the ability to easily visualize and target fascial planes with ultrasound imaging led to an explosion in the number of fascial blocks described, especially of the torso [14].

In 2011, Blanco [15] described an interfacial block alternative to paravertebral and thoracic epidural blocks, previously considered the gold standard for breast surgery. He called it "PECs Block" and realized that his patients needed minimal postoperative analgesia [15]. The pectoral block is simple and superficial, requiring a linear ultrasound probe to perform it. The necessary sonographic window is similar to the infraclavicular window of the brachial plexus, adjusting the longitudinal probe below the clavicle [15].

Thus, the pectoral muscles are identified, with the pectoralis major muscle being more superficial and the pectoralis minor muscle being deeper and smaller. Between these muscles, the thoracoacromial artery is located, which must be located, as the lateral pectoral nerve is nearby. The local anesthetic depot is located next to the thoracoacromial artery, with volume between 0.15 and 0.2 mL/kg [16].

In 2012, Fajardo et al. [17] described a second version of the pectoral block, which was called modified PEC or PEC II. This new approach, in addition to blocking the intercostal nerves, aims to block the armpit, necessary for major breast surgeries and removal of sentinel lymph nodes or lumpectomies. In this block, two needle approaches are used, the first being the PEC I with an injection of 10 mL and the second being the injection of 20 mL

between the pectoralis minor muscle and the serratus muscle. In this way, it is possible to break the armpit barrier and ensure blockage of the long thoracic nerve and at least two intercostal nerves [17].

From Fajardo et al. [17], other authors found results in which pectoral nerve block significantly reduced the need for analgesics and pain scores [18,19]. It is worth noting that most of the work involves blocks for oncological surgeries [20,21]. At the time of the study, in the literature, there was still a lack of studies that proved its effectiveness in aesthetic surgeries, especially breast augmentation with submuscular prosthesis.

4. Methods

4.1. Study Design

A prospective, clinical, interventional, randomized, parallel, superiority, and double-blind study was carried out, which aimed to evaluate the effectiveness of pectoral nerve blocks in breast augmentation surgeries.

The study was carried out at Hospital São Paulo (HSP). All procedures were performed in accordance with the current revision of the Declaration of Helsinki and Guidelines for Good Clinical and Research Practice. The project was approved by the Research Ethics Committee of the Federal University of São Paulo—Hospital São Paulo, and was registered with Clinical Trials (NCT 03488888).

Subjects were recruited from the group of patients referred to by the plastic surgery service and who underwent elective surgery at HSP. These include outpatients presenting for preoperative and anesthetic assessment prior to surgical scheduling. Hospitalized patients were invited to participate in the study the day before surgery. Assistant physicians, postundergraduate students, and residents of the anesthesia and plastic surgery team were informed about the performance of this protocol. In this way, those involved in primary care and preoperative assessment helped identify patients eligible for this protocol.

The Free and Informed Consent Form (FICF) was offered to patients only after authorization of the approach by one of the investigators. Consent was obtained by physicians. Only subjects capable of providing their own consent were approached. The responsible investigator ensured that the subject understood the risks and benefits of participating in the study and answered all questions asked by the subject. All study participants were informed of the study objectives and potential risk. At least one of the study members was always available to answer any questions.

4.2. Inclusion and Non-Inclusion Criteria

Adult female patients aged 18 years or older and scheduled for breast augmentation surgical procedures, with weight greater or equal to 40 kg, as well as ASA I and II physical status, who consented to participate in the study were enrolled and included in the study. Patient characteristics that led to exclusion from the study included pregnancy, severe heart disease, previous breast surgery, history of chronic pain, neuromuscular disease, cognitive impairment or active psychiatric illness, infection at the surgical or blockade site, coagulopathy, and history of allergy to bupivacaine or morphine. Patients will be excluded from the study if a technical error is found during the block or if the patient chooses not to continue in the study.

4.3. Treatment Protocol

When the subjects were identified and the ICF was obtained, their medical history was reviewed, and pertinent data collected. After inclusion in the study, all patients were randomized by a computer into two groups: general anesthesia and general anesthesia associated with type II pectoral nerve block with 0.25% bupivacaine with vasoconstrictor.

All patients were monitored in accordance with Resolution No. 2174/2017, of the Federal Council of Medicine and the Brazilian Society of Anesthesiology with continuous electrocardiography (leads II and V5), non-invasive blood pressure, pulse oximetry, capnography, temperature, anesthetic depth, and continuous monitoring of the neuromuscular junction, until the patient's transfer to the post-anesthesia recovery room.

The anesthetic protocol was standardized, starting with the intravenous administration of lactated Ringer's solution, with subsequent administration of prophylactic antibiotics and midazolam as an anxiolytic benzodiazepine medication, at a dose of 2 mg. Induction of general anesthesia with propofol 2.5 mg/kg, fentanyl 3 μg/kg and atracurium 0.4–0.5 mg/kg, and a laryngeal mask was inserted. Maintenance of anesthesia in both groups with propofol and remifentanil in continuous infusion and according to intraoperative needs continued based on clinical parameters, such as heart rate and blood pressure.

No adjuvant medications, analgesics, NSAIDs, and alpha-2 agonists were administered intraoperatively. Postoperative analgesia was performed with morphine in a PCA pump, with a solution dilution of 0.5 mg/mL. The PCA programming was a 2 mL bolus with a seven-minute block, with a maximum dose of 35 mL in four hours. The titration of anesthetic medications was carried out according to the determination of the anesthesia team.

4.4. Intervention

After the induction of general anesthesia in the standardized manner previously described, the patients randomized to receive the block remained in a horizontal supine position, with the head facing the side contralateral to the block and the upper limbs abducted at 90 degrees. In all cases, the pectoral nerve block was performed by the same team of anesthesiologists, guided by US (GE LOGIQ 5 device) with a linear probe and using a 50 mm, 22-gauge needle (Stimuplex® A, B. Braum, Melsungen, Germany) for local anesthetic injection.

The bilateral approach was used as a technique for blocking the pectoral nerves with two needle approaches, the first on the anterior surface of the thorax and the second more laterally. After skin antisepsis with alcoholic chlorhexidine and ultrasonographic visualization of the pectoralis major and minor muscles and the thoracoacromial artery, 10 mL of 0.25% bupivacaine with adrenaline 1:200,000 is induced. The second needle approach was performed after visualizing the pectoralis major and serratus muscles, injecting 20 mL of the same solution between the two muscles.

4.5. Data Collection

At the end of surgery, all patients had reversal of neuromuscular block guided by TOF and removal of the laryngeal mask airway. Upon being taken to the anesthetic recovery room (PACU), all patients had their pain scores assessed. Patients with a numerical pain score of three or more received morphine in incremental doses, until they had a score lower than three. These doses were given as a bolus of 1 mg of morphine with reevaluation between five and ten minutes. From a numerical pain score value of three, all received control of the PCA pump.

It is important to highlight that the study was characterized as double-blind, since the patient and the postoperative evaluator were unaware of the randomization groups. Data collection took place in six different postoperative periods, through visits to the PACU and infirmary, evaluating the pain scale: (T0) one hour after the end of anesthesia; (T1) two hours after the end of anesthesia; (T2) four hours after the end of anesthesia; (T3) six hours after the end of anesthesia; (T4) twelve hours after the end of anesthesia; and (T5) twenty-four hours after the end of anesthesia. At all times, opioid consumption, pain at rest, and pain when moving were evaluated.

4.6. Outcome Variables

The primary outcome was opioid consumption in the immediate postoperative period, from the post-anesthesia recovery room until 24 h postoperatively. The secondary outcomes were pain scores in the immediate postoperative period using the numerical pain scale, from the post-anesthesia recovery room until 24 h postoperatively. Additionally, as a secondary outcome, the incidence of possible complications of pectoral nerve blocks was observed, such as pneumothorax, hematomas at the puncture site, and intoxication by local anesthetics.

4.7. Statistical Analysis

The collected data were treated statistically. Quantitative variables were presented as mean and standard deviation for parametric variables, median and minimum and maximum values for non-parametric variables, and number of valid observations. The Student's *t*-test was used to compare the blocks in relation to the morphine bolus variable in the PACU and also to each of the times of the PCA morphine consumption variables in the postoperative period and the pain scale at rest and in movement. To compare the blocks in relation to the variables of postoperative morphine consumption and pain scale at rest and in movement, over time, the analysis of variance (ANOVA) model was used for repeated measures, considering the block factor. The significance level adopted was 5% ($p \leq 0.05$).

To estimate the number of patients, the study by Kang et al. [22] is used as a reference for reducing pain intensity. In this study, patients undergoing breast augmentation without and with intercostal block showed a reduction in pain, assessed by VAS, from 7.1 ± 0.74 to 3.50 ± 1.81. In this way, a 50% reduction in pain in the immediate postoperative period of patients undergoing breast augmentation was considered with the performance of the PEC II block. A power of 0.8 was considered, as well as a two-tailed hypothesis test and the detection of a significant difference between the groups with an alpha of 0.05 [22]. With this, the total sample size was estimated at 34 patients, with 17 cases collected in each group. Considering potential losses, 36 patients were randomized (Figure 1).

The primary outcome was opioid consumption in the immediate postoperative period from the post-anesthesia recovery room to 24 h postoperatively. The secondary outcomes were pain scores in the immediate postoperative period using the numerical pain scale, from the post-anesthesia recovery room to 24 h postoperatively. Additionally, as a secondary outcome, possible complications were observed, such as pneumothorax and local anesthetic poisoning.

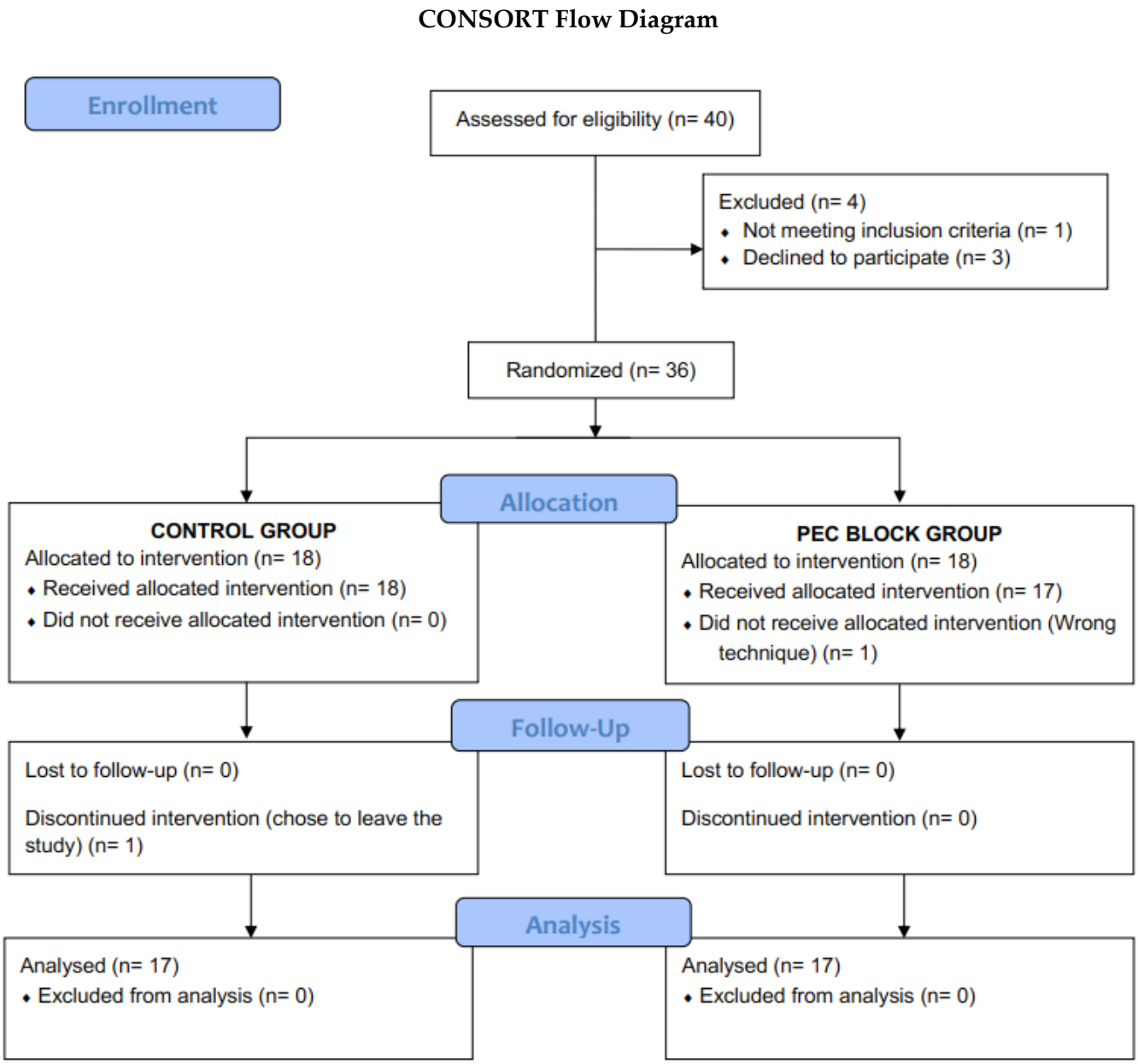

Figure 1. CONSORT flow diagram.

5. Results

During the research period, 40 patients were evaluated for participation in the study. Of these, four were excluded because one did not meet one of the inclusion criteria (weight < 40 kg) and three due to lack of institutional structure (absence of a PCA pump). In this way, thirty-six patients were allocated and randomized; however, one wished to leave the study in the immediate postoperative period, due to excessive pain, and one did not receive the standardized pectoral nerve block technique, as the dispersion of the local anesthetic was not made in the correct location. Thus, 34 patients completed the study and had their data analyzed. There was no difference between the groups in relation to most patient characteristics, surgery and anesthesia time, and intraoperative consumption of fentanyl and remifentanil. Patients in the control group had a higher body mass index (BMI); however, there was no difference between the groups for weight and height. Demographic data are presented in Table 1.

Table 1. Demographic data, procedure information, and opioids used intraoperatively.

PEC (n = 17)	Control (n = 17)	*p* Value
Age (years)		
28.8 ± 6.0	29.5 ± 6.7	0.750
Weight (kg)		
54.4 ± 4.2	56.4 ± 4.8	0.196
Height (m)		
1.63 ± 0.04	1.61 ± 0.05	0.388
BMI ((kg/m^2)		
20.5 ± 1.5	21.7 ± 1.8	0.047
Anesthesia time (min)		
153 ± 20	160 ± 24	0.400
Surgery time (min)		
74 ± 22	87 ± 21	0.100
Fentanyl (mcg/kg)		
3.0 ± 0.1	3.0 ± 0.3	0.678
Remifentanil (mcg/kg/min)		
0.26 ± 0.17	0.23 ± 0.13	0.559

(kg: kilogram; m: meter; m^2: square meter; min: minute; and mcg: microgram).

Upon arrival at the PACU, so that the pain score was less than three, patients in the control group received a greater amount of morphine compared to patients who underwent PEC II block, being 6.2 ± 2.5 mg versus 2.8 ± 2.3 mg ($p = 0.0001$), respectively. It is worth noting that, to achieve this pain score, the dose was 1 mg of morphine, with reassessment every three to five minutes. From this moment on, both groups had the opportunity to use morphine PCA. Until the fourth hour of assessment, despite the pain being similar, patients who did not receive PEC II blocks had higher morphine consumption, even considering the accumulated dose (Table 2) or evaluated in each period (Table 3).

Table 2. Accumulated morphine dose.

Accumulated Morphine Dose (mL)			
PEC (n = 17)	**Control (n = 17)**	***p* Value**	**Delta**
1st Hour (PACU)			
3.4 ± 3.0	5.2 ± 2.6	0.073	34.6%
2nd Hour			
8.6 ± 4.7	14.4 ± 4.9	0.001	40.3%
4th Hour			
15.5 ± 8.2	26.7 ± 5.7	0.0001	41.9%
6th Hour			
23.5 ± 13.2	40.4 ± 7.6	0.0001	41.8%
12th Hour			
35.7 ± 20.5	58.9 ± 12.9	0.0001	39.4%
24th Hour			
51.2 ± 29.0	78.0 ± 18.8	0.010	34.4%

Table 3. Morphine dose by intervals.

Morphine Dose Per Interval (mL)			
PEC (n = 17)	**Control (n = 17)**	***p* Value**	**Delta**
1st Hour (PACU)			
3.4 ± 3.0	5.2 ± 2.6	0.073	34.6%
2nd Hour			
5.2 ± 3.1	9.2 ± 3.6	0.002	43.5%
4th Hour			
6.9 ± 4.8	12.4 ± 4.1	0.001	44.4%
6th Hour			
8.0 ± 5.8	13.7 ± 4.1	0.003	41.6%
12th Hour			
12.1 ± 9.6	18.6 ± 8.7	0.047	34.9%
24th Hour			
14.2 ± 11.9	21.2 ± 9.7	0.097	33.0%

Opioid consumption by patients who did not receive regional anesthesia was consistently higher, with an average consumption of 38.7% higher than morphine. The peaks of differences in morphine consumption occurred in the fourth and sixth hour postoperatively. At these moments (fourth and sixth hour), patients who received only general anesthesia presented a numeric pain score significantly higher than the group that received PEC II block (Table 4). The greatest difference in the numerical pain scale between the groups studied was 36% greater in the control group compared to the intervention group.

Table 4. Numeric rating score at rest and when moving.

PEC (n = 17)	**Control (n = 17)**	***p* Value**	**Delta**
1a. Time (RPA)			
Resting pain			
5.47 ± 2.0	4.82 ± 2.1	0.368	−13.5%
Movement pain			
7.0 ± 1.8	6.8 ± 1.7	0.776	−2.9%
2a. Time			
Resting pain			
4.5 ± 1.9	4.9 ± 2.2	0.619	8.2%
Movement pain			
6.0 ± 1.7	6.8 ± 1.9	0.193	11.8%
4a. Time			
Resting pain			
3.2 ± 1.9	5.0 ± 2.2	0.018	36.0%
Movement pain			
5.7 ± 2.0	7.3 ± 1.8	0.016	21.9%

Table 4. *Cont.*

PEC (n = 17)	Control (n = 17)	*p* Value	Delta
6a. Time			
Resting pain			
3.4 ± 2.2	4.8 ± 1.9	0.044	29.2%
Movement pain			
5.4 ± 2.2	6.8 ± 2.1	0.065	20.6%
12a. Time			
Resting pain			
3.2 ± 2.1	4.4 ± 2.0	0.100	27.3%
Movement pain			
5.8 ± 2.0	6.2 ± 2.5	0.595	6.5%
24a. Time			
Resting pain			
2.7 ± 2.2	3.4 ± 2.2	0.405	20.6%
Movement pain			
5.5 ± 2.3	6.3 ± 2.0	0.332	12.7%

In the present study, there were no adverse reactions or complications, such as local anesthetic intoxication, pneumothorax, hematoma at the block site, or any other clinical repercussion that could impair the evaluation of the results.

6. Discussion

The present study demonstrates that patients who underwent pectoral nerve block, compared to the control group, had lower pain scores and decreased opioid consumption, especially in the first six hours of the postoperative period and especially at rest.

Pectoral nerve blocks are superficial regional blocks of the chest wall, focusing on the pectoral and intercostal facial planes. They gained great popularity, as they are simple techniques that are easy to perform, being alternatives to more invasive blocks, as they reduce the consumption of opioids in the perioperative period [16].

The results of our study are consistent with the results of Blanco et al. [18] and Fajardo et al. [17], as they demonstrate a decrease in postoperative opioid consumption. It is believed that blocking the pectoral nerves is a valuable tool in breast surgery. In some cases already described in the literature, the association with general anesthesia may not be required [23,24]. The regional anesthesia technique has proven to be effective, and in addition to being used for breast surgeries, it can also be used for minor chest wall surgeries, such as cardiac resynchronization implants [25,26].

It was observed that the control group had a higher BMI. However, both groups are in the same BMI range, being considered healthy patients (BMI between 18.5 and 24.9 kg/m^2). Despite this numerical difference between the BMIs of the groups studied, we believe that this fact did not influence the results of postoperative pain. It is important to highlight that high BMI can be an important factor in failure in regional anesthesia [27], and special attention should be paid when performing the technique in this population.

Analyzing pain management studies for submuscular breast augmentation surgeries, Leiman et al. demonstrated that pectoral nerve blocks performed before surgical incision, in addition to analgesia, prevent stretching of the pectoral muscles. In this way, the block facilitates the implantation of the submuscular prosthesis, reducing muscle spasm and its complications [28].

Comparing pectoral nerve blocks to the thoracic paravertebral block, the former appears to be superior for submuscular prosthesis surgery, as the paravertebral block

hardly reaches the roots of the brachial plexus, leaving the pectoral muscles uncovered for analgesia, even though they undergo considerable surgical manipulation [16]. It is worth mentioning that, in our study, we did not observe prosthesis retraction in the PEC group.

Regarding the volume used in pectoral blocks for subpectoral augmentation mammoplasty, Ekinci et al. determined that volumes of 20 mL of 0.25% bupivacaine in PEC I offer effective postoperative analgesia [29]. Our study, although it did not only carry out PEC I, but rather PEC II, used a total of 30 mL of the same anesthetic and concentration, proving that, with volumes starting at 20 mL, it is possible to reduce opioid consumption. However, Franco [29] carried out a study for subpectoral augmentation mammoplasty with the same volume, as well as the same anesthetic and concentration, in addition to performing PEC II, finding a reduction in opioid consumption up to 12 h after surgery. In comparison to our results, we demonstrated a reduction in consumption mainly in the first six hours of the postoperative period, with a volume of 30 mL and the same concentration.

Contrary to our results, a Canadian study evaluating PEC I for subpectoral breast augmentation did not provide pain relief [30]. The same article discusses that perhaps the association of PEC II can increase satisfactory results, as there would be dispersion of anesthetic to the lateral cutaneous nerves of the intercostal nerves, as well as the intercostobrachial nerve [31]. These satisfactory results were found in our study with a decrease in opioid consumption [32]. Another article [33] also demonstrated that PECs, when used for mastectomy, did not prolong analgesia time and pain scale scores compared to general anesthesia. Although we used the same volume (30 mL), the local anesthetic was not the same (0.25% of levobupivacaine).

One of the hypotheses that may explain less satisfactory results from PECs is that branches of the medial pectoral nerve that innervate the lower part of the pectoralis major muscle are asymmetrical and vary in location and length. However, they are all located in a triangular area, easily defined by ultrasound landmarks, lateral to the thoracoacromial artery. The branches of the lateral pectoral nerve have a consistent location adjacent to the artery [31].

The superficiality of pectoral blocks and the clear visualization of the pleura using ultrasound are their main advantages [22]. Although inadvertent vascular injection may still occur, in the current study, no block-related complications were observed in association with general anesthesia. The security related to pectoral blocks is also proven in the literature [23], even when compared to infiltration techniques [32].

Unlike most studies in the literature, the research did not use adjuvant analgesic medication, such as NSAIDs, alpha-2 agonists, and EV analgesics. In this way, we believe that our results reveal the real analgesic value of the blocks, without another medication being able to create masking. The rescue drug was morphine, quantified in both groups, being lower in the PEC group. Therefore, we attribute this result solely to pectoral blocks. Although most studies show that pectoral blocks reduce opioid consumption [19,20,23,24,26], some studies do not show the same result [29,30,32,33].

As a limitation of the study, it is worth mentioning that the first hour of the evaluation was hampered due to the bolus administration of morphine for the comfort of patients in the immediate postoperative period. Another limitation of our study was that the assessment was carried out only in the first 24 h after surgery. The failure to compare pectoral blocks in association with chest wall blocks, such as the serratus plane block, limits the comparison of results with other studies in the literature [33]. Furthermore, we did not find statistically significant improved analgesia scores during mobilization, which might affect the overall effectiveness of the procedure.

Lastly, results indicate that in clinical practice, an effective multimodal plan should be adopted beforehand anticipating the end of the PEC II block, preventing rebound pain and providing good analgesia and comfort to such patients even after the 12th postoperative hour.

Limitation

A limitation of this study is that the first hour of evaluation was influenced by the bolus administration of morphine, given for patient comfort in the immediate postoperative period. Another limitation is that assessments were conducted only within the first 24 h post-surgery. Additionally, the lack of comparison between pectoral blocks and other chest wall blocks, such as the serratus plane block, restricts our ability to compare results with existing literature [33]. Finally, we did not observe statistically significant improvements in analgesia scores during mobilization, which may impact the perceived effectiveness of the procedure.

7. Conclusions

It is possible to conclude that patients undergoing breast augmentation with the submuscular technique under general anesthesia, in association with blockade of the type II pectoral nerves (PEC II), showed lower opioid consumption and lower pain scores in the perioperative period compared to those submitted only general anesthesia. Since there were no complications resulting from the blockages carried out, this study observes the safety and effectiveness of procedures.

Thus, pectoral nerve blocks become an alternative reliable and safe multimodal analgesia apparatus for mammoplasty surgery increase.

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Conflicts of Interest: The authors declare no conflict of interest.

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