



## A Randomized controlled trial on recovery profile- Comparison between pecs block with sedation vs General anaesthesia for day care breast surgeries

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### Abstract

#### Background:

Regional anaesthetic techniques for Day care breast surgeries are found to be associated with decreased incidence of postoperative pain, vomiting and need for ICU stay. we compared the recovery profile of patients undergoing day care breast surgeries under PECS block with sedation versus general anaesthesia.

#### Method:

After getting informed written consent 60 patients posted for day care breast surgeries were selected. Institutional ethical committee approval obtained and study was registered in CTRI

Group P: PECS block was performed under dexmedetomidine sedation with USG guidance first injection between two pectoralis muscles 10 ml of 0.5% ropivacaine was injected and 20 ml of 0.5% ropivacaine between pectoralis minor muscle and serratus anterior muscle

In Group G: patients received general anaesthesia with LMA.

**Results:** Both groups were demographically comparable. VAS Score was comparable between the groups during rest and abduction and in the PACU( p- value 0.89 and 0.40 respectively )and during discharge(a p- value of 0.1 and 0.099). Both the groups were comparable in the duration of analgesia (p- value 0.62). Two patients in group P and six patients in group G had PONV.Six patients in group P and 12 patients in group G had shivering. The Aldrete scores were better in group compared to group G (p-value 0.0001) group P achieved Aldrete scores earlier.Vitals were similar in both the groups during the postoperative period. The overall patients satisfaction scorecomparable. (p-value 0.399).

**Conclusion:** PECS block is a safe and effective alternative for general anaesthesia in day care breast surgeries.

**Keywords:** Analgesia,Anesthesia,General,Day care,Medical,Patient satisfaction score

### Introduction

Day care breast surgeries are usually done under general anaesthesia (GA) which may lead to delay in discharge of the patient. Pain, sedation, nausea and vomiting are the factors that delay the discharge of patients in day care surgeries. But delayed induction time and increased time to mobilisation of patients

postoperatively in regional anaesthetic techniques favour GA in ambulatory surgeries. However, Regional anaesthetic techniques are found to be associated with decreased incidence of postoperative pain, vomiting and need for monitoring in post anaesthesia care unit (PACU). [1]

Attributed to the aid of Ultrasound and understanding of the neural supply of the anterior chest wall and breast, the gate for Pecs block was opened; a novel interfascial plane block was originally described by Blanco. [2] This block was initially performed as Pecs I block and then modified as Pecs II block to suit the extent of surgery. Pecs I block is enough for superficial surgeries like fibroadenoma excision and prosthesis insertion, since the pectoralis major muscle is mainly affected. Meanwhile, Pecs II block favours mastectomy and axillary clearance, since lateral branches of intercostal nerves, long thoracic and thoracodorsal nerves are involved. While the surgeries described are major and extensive, role of PECS block in day care breast surgeries are not explored. There is a possible role of PECS block as sole anaesthetic technique in day care breast surgeries. Application of PECS block in these surgeries may enhance recovery profile and permit early discharge. Hence our study aims to compare recovery profile of patients undergoing day care breast surgeries under PECS block with sedation versus general anaesthesia.

### Methodology:

After obtaining institutional ethics committee approval, this study was done on 60 patients who underwent day care breast surgeries for a period of 9 months. This study was registered in Clinical Trials Registry – India (CTRI/2016/05/006914). Informed consent was obtained from all the patients following the guidelines of declaration of Helsinki. ASA 1 and 2 patients of age group 18 to 60 and weight between 30 and 70 kg, posted for unilateral breast surgeries

that lasted less than 2 hours were included in the study. Those who are unwilling to participate or having comorbid illnesses like drug allergy, pregnancy, cardiac, respiratory, renal and hepatic ailments were excluded from the study. The patients were randomised into two groups of 30 by computer-generated random numbers - Group 1 patients received PECS block and sedation with dexmedetomidine and Group 2 patients received general anaesthesia.

All patients were premedicated with Inj. Glycopyrrolate 0.2mg, Inj. Midazolam 1mg and Inj. Dexamethasone 4mg before the induction of anaesthesia after instituting standard monitoring. In

Group P, all patients received Inj. Dexmedetomidine 1µg/kg bolus followed by 0.5-0.8 µg/kg maintenance infusion till end of surgery along with PECS block. PECS block was performed at end of dexmedetomidine bolus with patient in supine position and ipsilateral upper limb in abducted position using a 23 G spinal needle under USG guidance. Under sterile precautions, linear high frequency (6–13 MHz) US probe was first placed at infraclavicular region and moved laterally to locate the axillary artery and vein directly above 1st rib where pectoralis major and pectoralis minor muscles are identified at this US window. After infiltration of the skin at puncture site with 2% lignocaine, the needle was inserted in plane with US probe to the fascial plane between two pectoralis muscles and 10 ml of 0.5% ropivacaine was injected. Then, the US probe was moved towards axilla till serratus anterior muscle identified above 2nd, 3rd and 4th ribs.

Fig 1. Ultrasound image of Pecs block



At this point needle was reinserted into the fascial plane between pectoralis minor muscle and serratus anterior muscle and 20 ml of 0.5% ropivacaine was injected in increments of 5 ml after aspiration. The sensory level was tested with pin prick before surgery. Inadequate sensory block after 15min was considered as failure and general anaesthesia was administered.

In Group 2, patients received general anaesthesia with LMA. Induction was done with fentanyl 2 µg/kg, propofol 2-3 mg/kg & Inj. Atracurium 0.5mg/kg. Appropriate size LMA was used to secure airway. Anaesthesia was maintained with desflurane 3-4% and O<sub>2</sub>/air mixture with a fraction of 40% inspired O<sub>2</sub>. Residual neuromuscular block was reversed at end of surgery and LMA removed before shifting to recovery.

Fentanyl 25 µg in bolus doses was given intravenously if the mean blood pressure (MBP) or heart rate exceeded 20% of the preoperative value. Hypotension defined as a decrease of more than 20% of the base line MBP was treated with increments of 6 mg bolus doses of ephedrine iv and 250 ml of lactated ringer solution. Bradycardia was defined as decrease of more than 20% of baseline HR and was treated with Inj. Atropine 0.3mg iv. In addition, the dexmedetomidine infusion was stepped down in appropriate patients. Patients in both the groups

received 2ml/kg intravenous maintenance fluid. Inj. Paracetamol 1 g was intravenous bolus intraoperatively and Inj. Ondansetron 4mg at end of surgery.

After recovery from anaesthesia, patients were shifted to post-anaesthesia care unit (PACU) for monitoring and observation. Continuous monitoring of ECG, SpO<sub>2</sub>, NIBP and VAS scores for pain was done till discharge. Oral intake was stated at request of the patient. Postoperative analgesia was provided only on request with Tab. Diclofenac sodium SR 100 mg along with Tab. Pantoprazole 40 mg. Persistent pain was treated with Tab. paracetamol 500mg. In case of refractory pain, Inj. fentanyl 1 µg/kg was administered. Patients with persistent pain requiring parenteral opioid were admitted overnight for further management. Pain intensity was measured using VAS at rest and during abduction of the ipsilateral upper limb at PACU on admission and before discharge. VAS scores, time to first request for analgesia, amount of analgesics consumed were recorded. Subsequent episodes of nausea/vomiting were treated with iv metoclopramide 10 mg. Number of episodes of nausea and vomiting, need for parenteral therapy of antiemetics were recorded.

Patients' satisfaction for postoperative analgesia was recorded according to a satisfaction score (poor=0, fair = 1, good =2, excellent = 3). Recovery profile

was assessed using modified Aldrete score and Post Anaesthetic Discharge Scoring system (PADS). Both scores were assessed every 15 mins till they reach score of 9 or more. Patient were discharged when either scores equals or exceeds 9. Time to achieve a score of 9 in each scoring system was documented. Number of patients requiring overnight admission was recorded.

**Sample size estimation and statistical analysis**

We hypothesized that Pecs block provided a longer duration of analgesia in day care breast surgeries.For the study to have 80% power and alpha error at 0.05, a minimum of 25 patients would be required in each

**Results:**

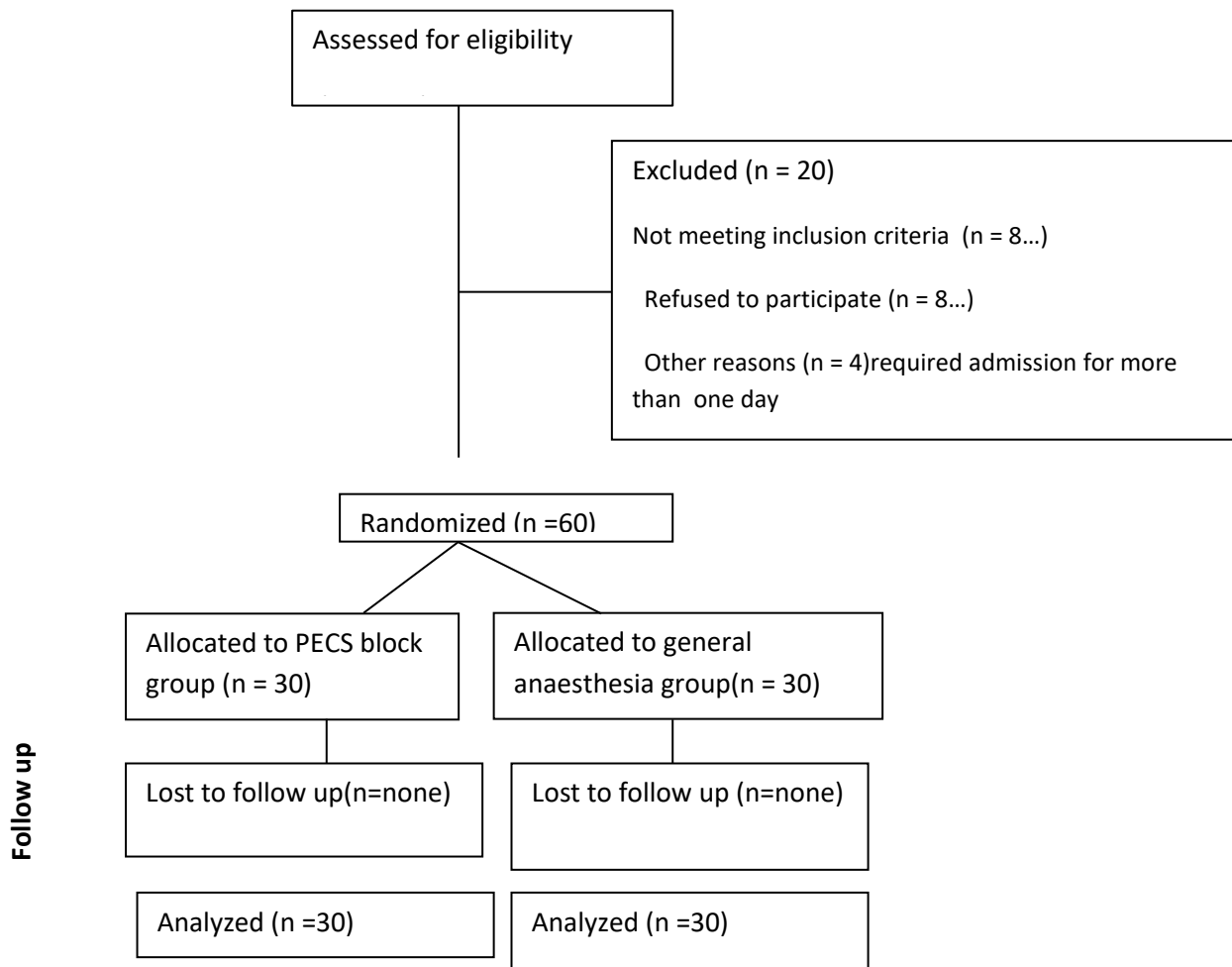
Eighty patients were recruited for the study, of which 60 cases were randomized in two groups of 30 after an attrition of 20 cases. No cases lost follow-up after

group to detect a 20% difference in duration of analgesia, assuming a standard deviation of 1.5.

Hence, we enrolled 30 patients in each group to compensate for possible dropouts.Data were entered in MS Excel spreadsheet (2010) and were analysed using the statistical package for social sciences version 22 (trial version).Descriptive statistics including proportions, measures of central tendency and measures of dispersion were used to describe the data.Further, Student’s t test was used to compare means between the groups and Chi-square test was used to compare proportions. A  $p < 0.05$  was considered to be statistically significant.A  $p < 0.001$  was considered highly significant.

randomization. The flow of the patients was depicted in the CONSORT (CONSolidated Standards Of Reporting Trials) diagram.

**Fig 2.CONSORT Flow chart**



Patients in both the groups were comparable in terms of demographic data like age, weight, height and ASA physical status.

**Table 1. Demography**

	Group P	Group G	P VALUE
AGE	46.53±10.11	41.23±12.99	0.0831
WEIGHT	60.6±8.9	57.75±8.05	0.1985
HEIGHT	138.5±11.9	139.9±10.88	0.6362
ASA	I-25 II-5	I-24 II-6	1.000
Duration of surgery (min)	52.83±7.12	52.13±7.56	0.7133

In group 1, the average VAS score was 3.53 at rest and 3.63 with abduction at admission in PACU which was statistically insignificant when compared to VAS scores of 3.5 at rest and 3.83 with abduction in Group 2 (p-value 0.89 and 0.40 respectively). Even at the time of discharge, the VAS scores were comparable between the groups (4.13 vs 4.56 at rest with a p-value of 0.1 and 4.2 vs 4.63 during abduction with a p-value of 0.099).

**Table 2. VAS**

	ADM TO PACU		AT DISCHARGE	
	AT REST	WITH ABDUCTION	AT REST	WITH ABDUCTION
Group P	3.533±1.008	3.633±0.93	4.133±1.008	4.2±1.0635
Group G	3.5±0.937	3.833±0.9128	4.56±1.006	4.63±0.927
P value	0.8960	0.4040	0.1059	0.0998

The time to rescue analgesia was 128 ± 13.48 min in group 1 and 130.58 ± 11.52 min in group 2. Both the groups were comparable in the duration of analgesia (p-value 0.62). Two patients in group 1 and six patients in group 2 had PONV, but was not statistically significant on comparison (p-value 0.25). Six patients in group 1 and 12 patients in group 2 had shivering, which was also not significant when comparing (p-value 0.16). The Aldrete scores were better in group 1 at every time point when compared to group 2 (p-value 0.0001), which was highly significant. Patients in group 1 achieved Aldrete scores earlier at 3 h compared to group 2.

**Table 3. Aldrete score**

	1HR	2HR	3HR	4HR
Group P	7.13±0.35	7.89±0.6178	9.37±0.49	10±0
Group G	5.766±0.430	6.4±0.77	7.1±0.305	7.9±0.66
P VALUE	0.0001	0.0001	0.0001	0.0001

The haemodynamic parameters like heart rate and blood pressure were similar in both the groups during the postoperative period. The overall patients' satisfaction score was 2.83 in group 1 which was comparable to 2.741 in group 2 and statistically insignificant. (p-value 0.399).

### Discussion:

Use of ultrasound guidance for nerve block has extended the scope of regional anaesthesia beyond the conventional nerve blocks. Several fascial plane blocks are performed under ultrasound guidance with increasing success rate. Abdominal plane block described in 2001 are now commonly used as part of laparoscopic surgeries as well as open surgeries to supplement intraoperative and postoperative analgesia. Blanco et al described novel PECS fascial plane block to supplement analgesia for surgeries on breast and anterior chest wall. [2] PECS block I and II has been used to supplement perioperative analgesia in major breast surgeries. In contrast to laparoscopic surgeries and hernia repair, minor breast surgery and chest wall procedures does not involve any visceral pain. In fact, a cardiac resynchronisation device placement on anterior chest wall was successfully performed in a high-risk patient under PECS II block combined with minimal sedation. [3] Similarly, case reports of giant fibroadenoma excision under PECS II block with internal intercostal plane block [4] and mastectomy with axillary clearance under PECS block with sedation [5] were described. Hence PECS has the potential to be used as a sole anaesthetic technique for minor breast surgeries. Our study aimed to address this question in day care minor breast surgeries as this was not evaluated previously. The results were encouraging as minor breast surgeries could be successfully done in most of the patients without need for general anaesthesia. The vital parameters are comparable between the groups. Patients who received PECS block had rapid early recovery scores, reduced postoperative pain scores and low incidence of nausea/vomiting.

Hakim et al compared single injection pectoral (PECS I and II) block with local anaesthetic infiltration for ambulatory breast augmentation procedures and found that PECS block group was significantly better in terms of intraoperative dexmedetomidine and fentanyl consumption, time to rescue analgesia, postoperative VAS scores and morphine consumption. [5] In various other studies on breast surgeries, PECS block was found to provide

effective analgesia and was suggested as better alternative for other regional anaesthetic techniques like Serratus Anterior block [6], thoracic paravertebral block [7,8], and thoracic epidural analgesia [9]. Though there are possibility of complications like pneumothorax [10] and vascular injury, we did not encounter any, attributed to the advantage of ultrasound guidance. Transient weak crossed arm adduction on motor examination was observed following PECS and serratus anterior blocks in few cases due to paresis of serratus muscle. [13] We did not find the incidence of PONV to be different between the groups. This may be due to the fact the surgical population included primarily were of short duration procedures and the routine administration of antiemetic prophylaxis has reduced the incidence of PONV. Patients in PECS group achieved earlier time to discharge which is similar to the results observed in Wang et al study, where patients who received PECS and serratus-intercostal plane block had significantly lesser time to discharge from PACU compared to control group who received general anaesthesia. The patient satisfaction score was good in our study which correlated to other similar studies. [5,11]

There are few limitations in our study. The control group did not get placebo blocks, hence double blinding could not be done. We did not assess the extent of dermatomal levels of sensory block and onset time of block. The depth of anaesthesia was not monitored to guide the intraoperative opioid supplementation.

### Conclusion:

Pectoralis (PECS 1 and 2) block with sedation provided excellent anaesthesia and favourable recovery profile with better pain scores and no complications. We recommend PECS block as a safe and effective alternative for general anaesthesia in day care breast surgeries.

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