

Original Contribution

Pectoral nerve blocks to improve analgesia after breast cancer surgery: A prospective, randomized and controlled trial



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ABSTRACT

Study objective: To evaluate the analgesic efficacy of ultrasound guided combined pectoral nerve blocks I and II in patients scheduled for surgery for breast cancer.

Design: Prospective, randomized, control trial.

Setting: Operating rooms in a tertiary care hospital of Northern India.

Patients: Sixty American Society of Anesthesiologists status I to II adult women, aged 18–70 years were enrolled in this study.

Interventions: Patients were randomized into two groups (30 patients in each group), PECS (P) group and control (C) group. In group P, patients received both general anesthesia and ultrasound guided combined pectoral nerve blocks (PECS I and II). In group C, patients received only general anesthesia.

Measurements: We noted pain intensity at rest and during abduction of the ipsilateral upper limb, incidence of postoperative nausea and vomiting; patient's satisfaction with postoperative analgesia and maximal painless abduction at different time intervals in both groups.

Main results: There was significant decrease in the total amount of fentanyl requirement in the in P group $\{(140.66 \pm 31.80 \mu\text{g}) \text{ and } (438 \pm 71.74 \mu\text{g})\}$ in comparison to C group $\{(218.33 \pm 23.93 \mu\text{g}) \text{ and } (609 \pm 53.00 \mu\text{g})\}$ during intraoperative and post-operative period upto 24 h respectively. The time to first analgesic requirement was also more in P group $(44.33 \pm 17.65 \text{ min})$ in comparison to C group $(10.36 \pm 4.97 \text{ min})$ during post-operative period. There was less limitation of shoulder movement (pain free mobilization) on the operative site at 4 h and 5 h after surgery in P group in comparison to C group. However there was no difference in the incidence of post-operative nausea and vomiting (22 out of 30 patients in group P and 20 out of 30 patients in group C) but patients in group P had a better satisfaction score with postoperative analgesia than C group having a p value of <0.001 (Score 1; 5 VS 20; Score 2; 12 VS 9; Score 3; 13 VS 1).

Conclusions: Ultrasound guided combined pectoral nerve blocks are an effective modality of analgesia for patients undergoing breast surgeries during perioperative period.

Clinical trial registration: CTRI/2015/12/006457

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1. Introduction

Patients undergoing breast surgeries experience high grade post-operative pain, thus increasing patient morbidity [1–3]. Patients in whom pain is controlled in the early postoperative period may be able

to actively participate in postoperative rehabilitation, which may improve short- and long-term recovery after surgery [4]. Thus, control of post-operative pain is an essential requirement in these surgeries [5].

First characterized in 2011 and 2012 respectively, the pectoral nerve block I (PECS I) and pectoral nerve block II (PECS II) provide analgesia for breast surgeries with very little adverse effects. PECS I blocks the medial and lateral pectoral nerves which derive from the brachial plexus and the PECS II block anesthetizes the lateral branch of intercostal nerve [6]. It is important to emphasize the advantages of pectoral nerve block as there is no sympathetic block, and it is a simple and fast-acting block. Other advantages include superficial block, performed with supine patient, covers the majority of the breast/chest wall [6–8].

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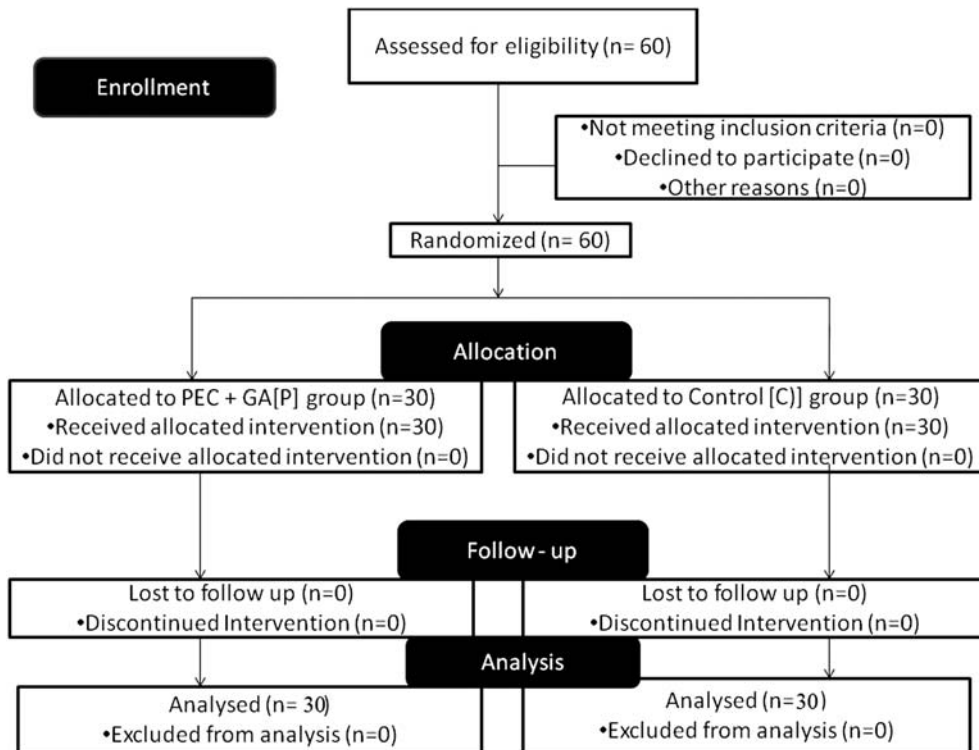


Fig. 1. Consort diagram.

There is limited literature of combined pectoral nerve blocks on patients undergoing breast cancer surgeries, therefore we need more confirmatory studies [9].

We hypothesize that pectoral nerve blocks with general anesthesia provide superior analgesia with less opioid consumption during intra-operative and post-operative period compared to opioid mediated

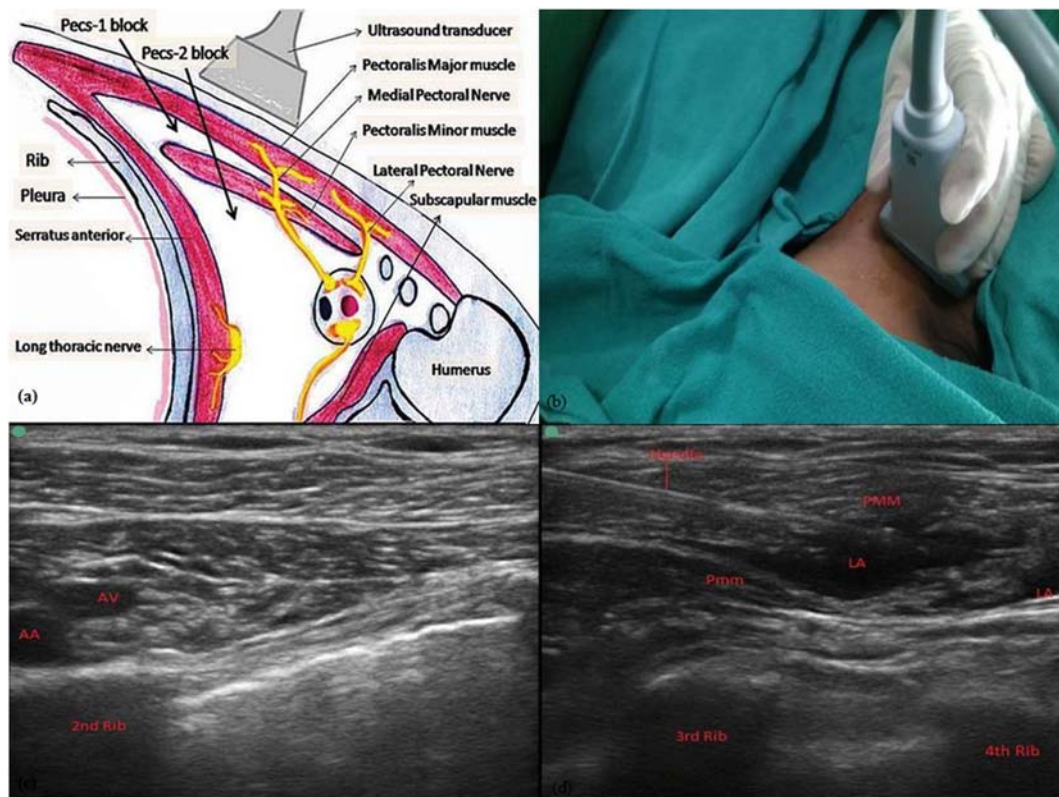


Fig. 2. (a) Anatomical basis of pectoral nerves block (b) ultra sound probe position (c) ultra sonographic anatomy and identification of 2ndRib (AV-Axillary Vein, AA-Axillary Artery) (d) Pectoral nerve block I and II (PMM – Pectoral Major Muscle, Pmm – Pectoral minor muscle, LA - Local anesthetic).

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