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PECS 1 block as analgesic adjuncts in breast augmentation surgery

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Abstract

The analgesic benefits of using pectoral nerve (PECS) block as regional analgesia in breast cancer surgery have been widely published. However, the use of PECS block in aesthetic breast surgery remains underreported. Breast augmentation is one of the most popular plastic surgery procedures. Pain and discomfort are common after breast augmentation surgery. We report a case series using ultrasound-guided PECS 1 block as part of multimodal analgesia, which further enhanced the recovery experience in patients undergoing primary augmentation mammaplasty using silicone implants in a day-surgery setting.

Keywords: mammaplasty, nerve blocks, pectoral nerve, plastic surgery procedure

Introduction

The analgesic benefits of using pectoral nerve (PECS) block as regional analgesia in breast cancer surgery have been widely published.[1,2] The working group for the procedure-specific postoperative pain management (PROSPECT) guidelines made a Grade A recommendation for using PECS block for major oncological breast surgery if no axillary node dissection or paravertebral block is contra-

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indicated.[2] However, the use of PECS block in aesthetic breast surgery remains underreported. Breast augmentation is one of the most popular plastic surgery procedures, with 1,624,281 procedures reported worldwide in 2020.[3] Pain and discomfort are common after breast augmentation surgery and the expected clinical experience has been described in numerous patient information sites.[4,5] Wallace *et al.* surveyed 282 women concerning pain after breast surgery.[6] Thirty-eight percent of the women with breast augmentation complained of pain. Women who had reconstruction using breast implants had a higher incidence of pain (53%).[6] There was no relationship between using silicone or saline implants and pain (22% and 33%, respectively). However, submuscular placement of the implants resulted in a significantly higher incidence of pain (50%) than subglandular placement (21%).[6] Patients are expected to experience lots of soreness, tightness in the chest, fatigue, nausea, swelling and bruises in the first week after the surgery. These symptoms will fade over time with a multimodal oral analgesia prescription.[4,5] Despite knowing the moderate pain intensity after surgery, many are still keen to undergo breast augmentation surgery for aesthetic reasons and to boost their self-esteem.

Case series

We report a case series using ultrasound-guided PECS 1 block as part of multimodal analgesia which further enhanced the recovery experience in 7 patients undergoing primary augmentation mammaplasty using silicone implants, also known as aesthetic breast augmentation surgery. All surgeries were performed by a single surgeon, same anaesthetist team in a day-surgery setting. Written consent for publication was obtained from all patients. Our manuscript was prepared in accordance to CARE reporting guidelines, a set of guidelines developed to increase the transparency, accuracy, and usefulness of case reports.

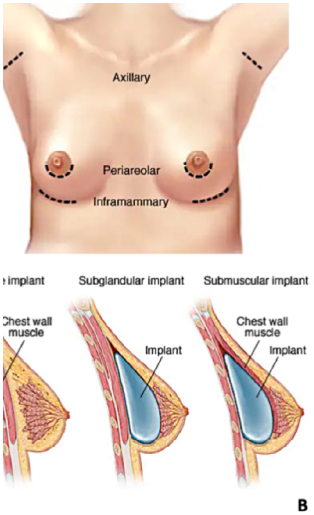
As shown in Table 1, the patients' median age was 37 years-old (interquartile range, IQR, 35.0–41.0) and the mean BMI was 21.26 (± 1.24) kg/m^2. The median implant volume for each side of the breast was similar, 360.0 ml (IQR, 335.0–450.0). They all received general anaesthesia using a laryngeal mask airway, maintenance of anaesthesia with sevoflurane (minimal alveolar concentration 0.8–1.0, measured, age-adjusted, and calculated by the ventilator) in a mixture of oxygen and nitrous oxide. Multimodal intravenous analgesic was given including opioids (100 mcg fentanyl during induction of anaesthesia, 25–50 mg pethidine), acetaminophen 1 g, and parecoxib 40 mg plus antiemetics dexamethasone 4 mg and ondansetron 4 mg. Ultrasound-guided PECS 1 block was administered after induction of general anaesthesia with levobupivacaine 0.25% 10 ml each side using

Table 1. Patients demographic profile, prosthesis implant volume, pain score and incidence of postoperative nausea vomiting

Case	Age	BMI (kg/m2)	Prosthesis implant volume (Right)	Prosthesis implant volume (Left)	Pain* score (at PACU)	Pain score* (prior to discharge)	Pain score* (POD1 during clinic review)	PONV
1	41	21.9	335	335	0	0	2	0
2	33	20.6	315	315	0	0	2	0
3	35	22.2	360	335	1	2	3	0
4	46	22.8	450	450	1	1	2	0
5	41	21.1	450	450	0	1	3	0
6	36	19.0	360	360	0	1	2	0
7	37	21.2	550	450	1	1	3	0

BMI: body mass index; PONV: postoperative nausea vomiting; PACU: post-anaesthesia care unit; POD1: postoperative day 1
* Pain score by Numerical Rating Scale (NRS)

ultrasound SUI Apogee 2100 (Shantou, P.R. China) with linear probe and a 21-G 100 mm insulated short bevel needle (Stimuplex A, BBraun, Melsungen, Germany) (Fig. 1D and 1E). The surgeon also routinely administered local infiltration at the incision site (average length of 3 cm) and tissue plane using marcaine 0.5% with adrenaline solution (1 vial of 20 ml bupivacaine 0.5% with adrenaline 1:200,000 mixed with 50 ml saline) prior to tissue dissection to minimize bleeding after the surgery. All patients had excellent analgesia experience with zero postoperative nausea and vomiting in the day-care setting. The median pain score measured by numerical rating scale (NRS) in the recovery area was 0 (IQR, 0.0–1.0) and in the day-surgery ward review prior to discharge was 1.0 (IQR, 0.0 – 1.0). Patients were allowed home within 6 hours after the surgery. The clinical difference from the PECS 1 block was that patients could ambulate comfortably and wear their clothes easily. Chest tightness was present without soreness. Postoperatively, all patients received regular oral analgesics, which included 1 tablet acetaminophen 500 mg/codeine 8 mg 3 times daily and etoricoxib 90 mg once daily. During the day 1 postoperative review by the surgeon at the clinic, most patients had developed mild pain with a median pain score of 2.0 (IQR 2.0–3.0). This was manageable with the prescribed oral analgesics.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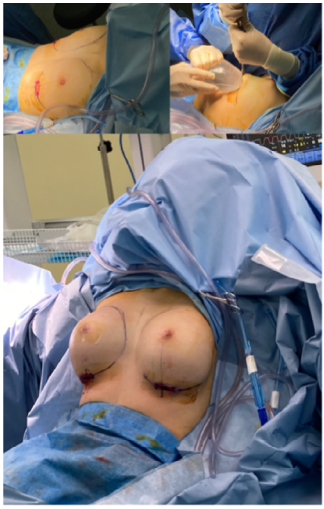

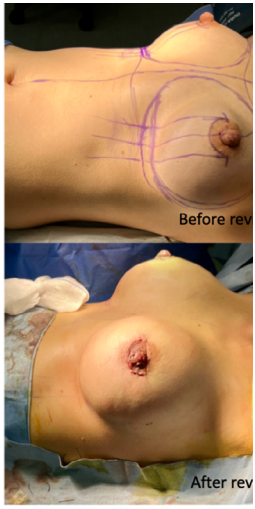
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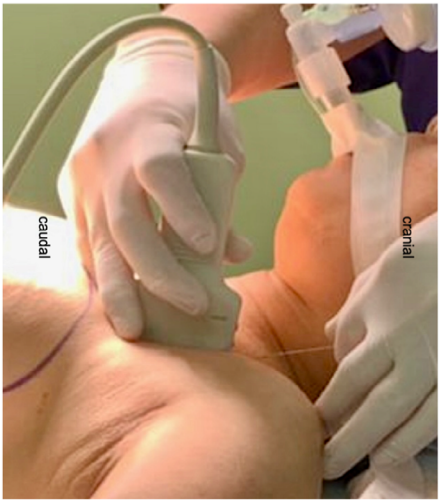
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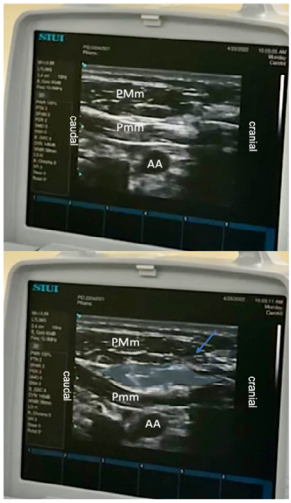
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Fig. 1. (*A*) Breast augmentation surgery: incision sites and placement of breast implants (submuscular insertion for all our case series). Mayo Clinic Staff. Breast Augmentation. Mayo Clinic. Published: August 12, 2022. Retrieved: October 10, 2022. Available from: https://www.mayoclinic.org/tests-procedures/breast-augmentation/about/pac-20393178. (*B*) Bilateral hypomastia during insertion of breast implant and post-breast augmentation. (*C*) Case for discussion (not part of case series) of a patient who underwent revision augmentation breast with nipple reduction surgery using periareolar incision and subglandular implant placement. The previous smaller breast implant was inserted using periareolar incision by another surgeon and it had developed capsular contraction, which was clearly visible at the inferomedial aspect of the left breast [before revision image]. (*D*) Ultrasound guided PECS 1 block, needle insertion cranial to caudal using BBraun Stimuplex A 21-G 100 mm. (E) Sonoimages of PECS 1 block before and after local anaesthetic deposition. Blue arrow: needle echo shadow; blue shade: local anaesthetic deposits in the interfascial plane; PMm: pectoralis major muscle; Pmm: pectoralis minor muscle; AA: axillary artery.

PECS 1 block is an ultrasound-guided interfascial injection of local anaesthetic between the pectoralis major and pectoralis minor muscles. Thus, it blocks both the medial and lateral pectoral nerves, which innervate the pectoralis muscles. The pectoralis muscles relax following motor block, which was demonstrated by Desroches *et al.*[7] in a prospective, volunteer, randomized-controlled, double-blind study. Muscle relaxation helped reduce the chest tightness and discomfort after breast implant insertion (submuscular). All patients who undergo primary breast augmentation surgery are expected to experience chest tightness due to acute expansion with the high implant volume, and some patients might perceive this tightness as pain and discomfort. In our cohort, PECS 1 block significantly alleviated the patients' discomfort, and our surgeon witnessed the significant benefits.

We also highlight another case of a woman who underwent revision breast augmentation surgery for previous capsular contraction (Fig. 1C) by the same surgeon and anaesthetist. The patient underwent subglandular implant placement via a periareolar incision (old incision site by another surgeon). She also received PECS 1 block as part of the multimodal analgesic regime just as described in the above case series. She had a pain score of 0 at the post-anaesthesia care unit and prior to discharge home. Her pain score remained low (score 1) during the postoperative day-1 review at the clinic. For those cases who need revision breast augmentation surgery, the patient usually experiences less pain and tightness (because the body had adjusted to the tissue expansion from the previous implant insertion). PECS 1 block proved useful for those cases using subglandular implant placement (in primary breast augmentation surgery) as well as for the revision surgery because pectoralis muscles are often irritated during tissue dissection and capsulectomy.

Aarab *et al.*[8] also demonstrated that pectoral nerve block (combined PECS 1 and 2) with multimodal analgesia provides effective perioperative pain relief after aesthetic breast augmentation surgery and was associated with reduced opioid consumption over the first 5 postoperative days. This was a multicentre, double-blinded randomized controlled trial involving 73 adult female patients in a day-surgery setting in France. The maximal numerical rating scale score in the first 6 hours was lower in the pectoral nerve block group compared with the control group (3.9 ± 2.5 versus 5.2 ± 2.2; difference: -1.2 [95% CI, -2.3 to -0.1]; P = 0.036). The pectoral nerve block group had a lower maximal numerical rating scale between days 1 and 5 (2.2 ± 1.9 versus 3.2 ± 1.7; P = 0.032). Ciftci *et al.*[9] showed similar analgesic benefits of PECS 1 block after breast augmentation surgery as inpatient surgery in a randomized controlled study in Turkey. This study involved 90 female patients randomly divided into 3 groups (preoperative PECS, postoperative PECS, and control). PECS 1 block administered preoperatively decreased visual analogue pain scale (VAS) scores and opioid consumption following breast augmentation surgery. Administering the block postoperatively resulted in higher VAS scores in the first hour in the postoperative period. Therefore, we support the use of PECS 1 block prior to surgical incision.

Conclusion

Our case series demonstrated the analgesic benefits of PECS 1 block in the context of multimodal analgesia in breast augmentation surgery. Our patient population comprises Asians who usually belong to high social profiles (*i.e.*, models, social media influencers, and persons with honorary titles). According to the recommendations on pain management in breast surgery by the multidisciplinary expert panel of the American Society of Breast Surgeons,[1] we ought to identify those groups of patients with risk factors associated with having more acute postoperative pain after breast surgery. The identified risk factors are younger age, Asian race, preoperative anxiety or distress, preoperative depression, and preoperative expectations. Our clients for breast augmentation surgery often fall into the above category. Furthermore, aesthetic surgery demands comfort and minimal side effects after surgery.

In summary, although we did not measure patient's satisfaction by using the BREAST-Q Augmentation Module,[10] the surgeon testified that our team had positive feedback regarding the use of PECS 1 block as analgesic adjuncts in breast augmentation surgery from our patients.

Declarations

Informed consent for publication

The patients included in the case series as well as the patient whose case was included for discussion have provided informed consent for the publication of the clinical data and images contained in this article.

Competing interests

None to disclose.

Funding

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