Ultrasound-Guided Continuous Interpectoral Block for Patient Undergoing Mastectomy and Axillary Clearance

Mario Fajardo-Pérez1, Ece Yamak Altınpulluk2, Javier García-Miguel3, Borja Quintana-Gordon1
1Department of Anesthesiology, Móstoles University Hospital, Madrid, Spain
2Department of Anesthesiology, İstanbul University Cerrahpaşa School of Medicine, İstanbul, Turkey
3Department of Anesthesiology, Segovia General Hospital, Segovia, Spain

Introduction

The local anaesthetic (LA) injected between pectoral muscles spreads between the clavipectoral fascia and the deep layer of the pectoral fascia towards the axilla because the pectoralis major muscle (PMM) and pectoralis minor muscle (pmm) are part of the anterior axillary wall, effectively blocking the axilla (1). Ultrasound-guided pectoral nerve block (Pecs) is a novel interfascial plane block that has recently been introduced in clinical practice to provide analgesia to patients after reconstructive breast surgery. A recent study compared paravertebral block (PVB) with a combination of PVB and Pecs block in reconstructive breast surgery (2, 3). Here we present a case of continuous interpectoral block for postoperative analgesia after mastectomy.

Case Presentation

Informed written consent was obtained for the continuous interpectoral block procedure. In addition, permission for publication of this report was obtained from the patient, who was a 58-year-old woman scheduled for right mastectomy and axillary clearance with an unremarkable medical history. After inducing anaesthesia, we placed a 6–13-MHz linear transducer (Mindray M7 Shenzhen, China) below the outer third of the clavicle, transverse to the axis of the body. In the superficial plane, we identified fatty tissue. The intermediate plane was formed by the superficial pectoral fascia (SPF), PMM, deep pectoral fascia (DPF) and pmm surrounded by the claviculopectoral fascia. We visualised the thoracocromial artery (ATA) and cephalic vein between the muscular planes and the deep plane occupied by the intercostal muscles, pleura and lung (Figure 1).

The Tuohy needle (Vygon; Ecouen, France 18 G) was introduced using the in-plane approach from the medial to lateral direction, maintaining distance from structures like the pleura and blood vessels. The needle was advanced until the tip was positioned in the interfascial plane between PMM and pmm. A test dose was injected to determine that the tip had been placed correctly in the interfascial plane, shown by the separation of the fascial layers. It was then advanced further, and 10 mL of 0.25% levobupivacaine plus 1.200,000 adrenaline was injected to perform hydrodissection of the interfascial plane.
LA spread was visualised as it was injected. We recommended using colour Doppler ultrasonography to help identify ATA between PMM and pmm. A 20-G Thouy catheter (Vygon; Ecouen, France) was advanced 5 cm beyond the needle tip. After negative aspiration, 10 mL of LA was injected through the catheter while observing the displacement of the interfascial plane and was finally connected to an elastomeric pump (Dosi-fuser, Leventon, Izasa Hospital) containing 0.125% levobupivacaine, with the infusion rate of 5 mL h$^{-1}$ (Figure 2a-c). After surgery, pain was rated on a 10-point visual analog scale (VAS; 0, no pain; 10, the worst pain imaginable). The VAS score was evaluated as 2/10. After discharge from the Post Anesthesia Care Unit (PACU), the VAS score was rated as 1/10. The following morning, the patient was much more comfortable (VAS score 0–1/10), stable and free of intravenous opiodes. The pain was controlled by 25 mg oral ketoprophen and 1 g acetaminophen every 8 h for pain relief. The catheter was removed 48 h after the surgery.

Discussion

Using single-dose LA has some disadvantages and provides limited analgesia depending on the pharmacokinetic characteristics of LA usage. Nevertheless, the usage of continuous perineural infusions allows sustained pain control and facilitates patients' mobilisation, early rehabilitation and hospital discharge (4). In the past years, our group has been performing ultrasound-guided interpectoral block followed by the placement of catheters with the infusion of 0.0625%–0.125% levobupivacaine at a rate of 5–10 mL h$^{-1}$ in patients undergoing mastectomies with/without lymph node axillary
Breast surgery in some patients when this or other regional techniques cannot be performed.

Continuous interpectoral block provides analgesia to the lateral and medial pectoral nerves combined with several cutaneous branches of the intercostal nerves (11, 12). Continuous interpectoral block could become a safe alternative to PVB for breast surgery in some patients when this or other regional techniques cannot be performed.

Conclusion

This technique can be safely performed in an anaesthetised patient. In contrast to neuroaxial blocks (epidural and PVB), it requires an awake, cooperative patient. Possible indications of these techniques are mastectomies with/without lymph node axillary dissections, mastopexia, mammoplasty, subpectoral prosthesis, breast augmentation or prosthesis, pacemaker and pain in the anterior shoulder. These techniques are easy to understand and they provide a low complication rate, high success rate, systemic decrease in perioperative analgesic requirement, improvement in patient satisfaction, facilitation of patients’ mobilisation and early rehabilitation and hospital discharge. The other benefits of these techniques include applicability to the outpatient setting and to patients with neuraxial block. The ideal infusion rate for interpectoral block has not been determined. However, we used the infusion rate between 5-10 mL h⁻¹ and obtained good results. More randomised studies are needed to confirm whether interpectoral techniques are appropriate for routine clinical practice, but our results have been promising to date.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

Peer-review: Externally peer-reviewed.


Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References


