



Fig 1. Staged photograph showing transducer and needle orientation during Pectoral Fascial (Pecs) II block.

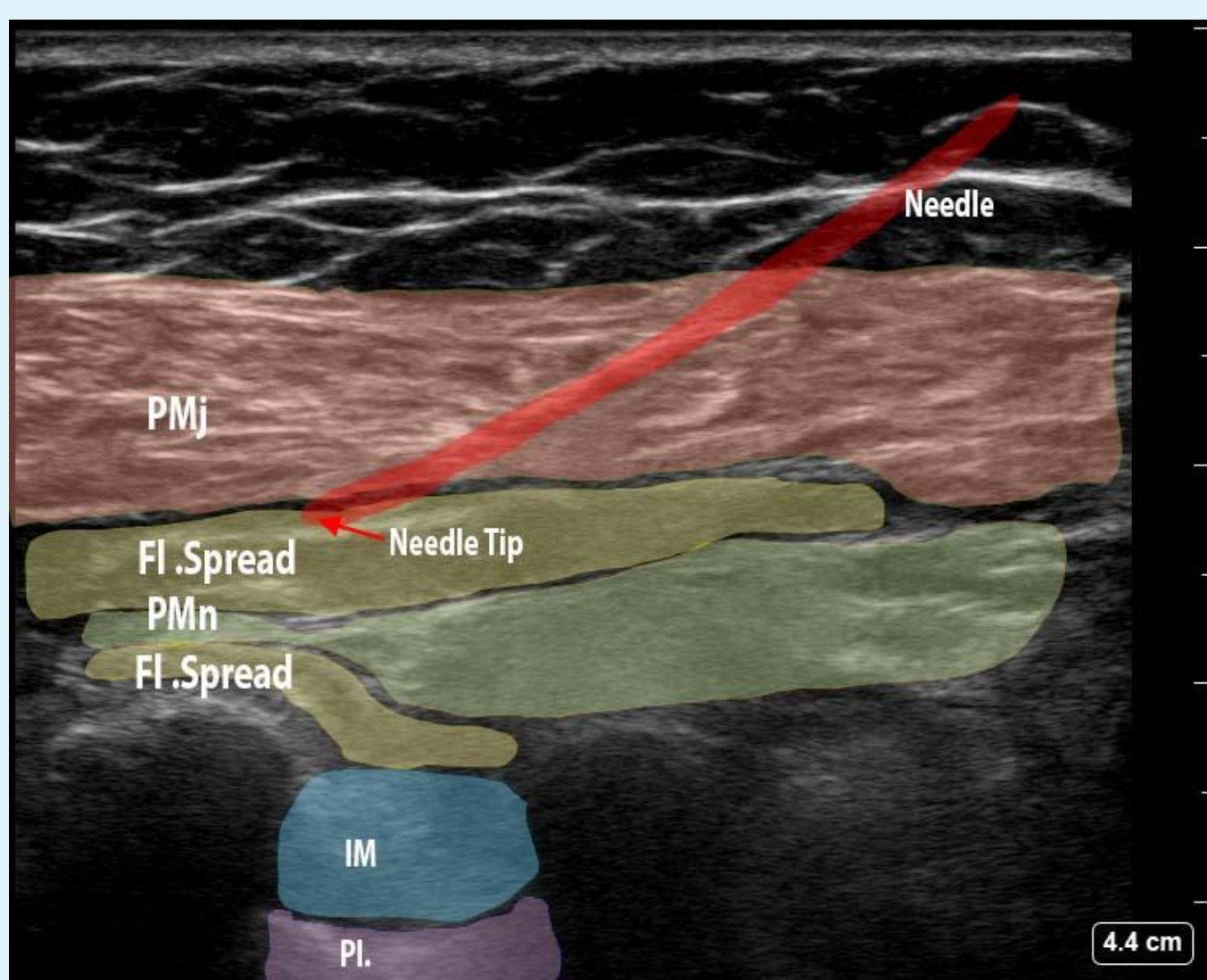
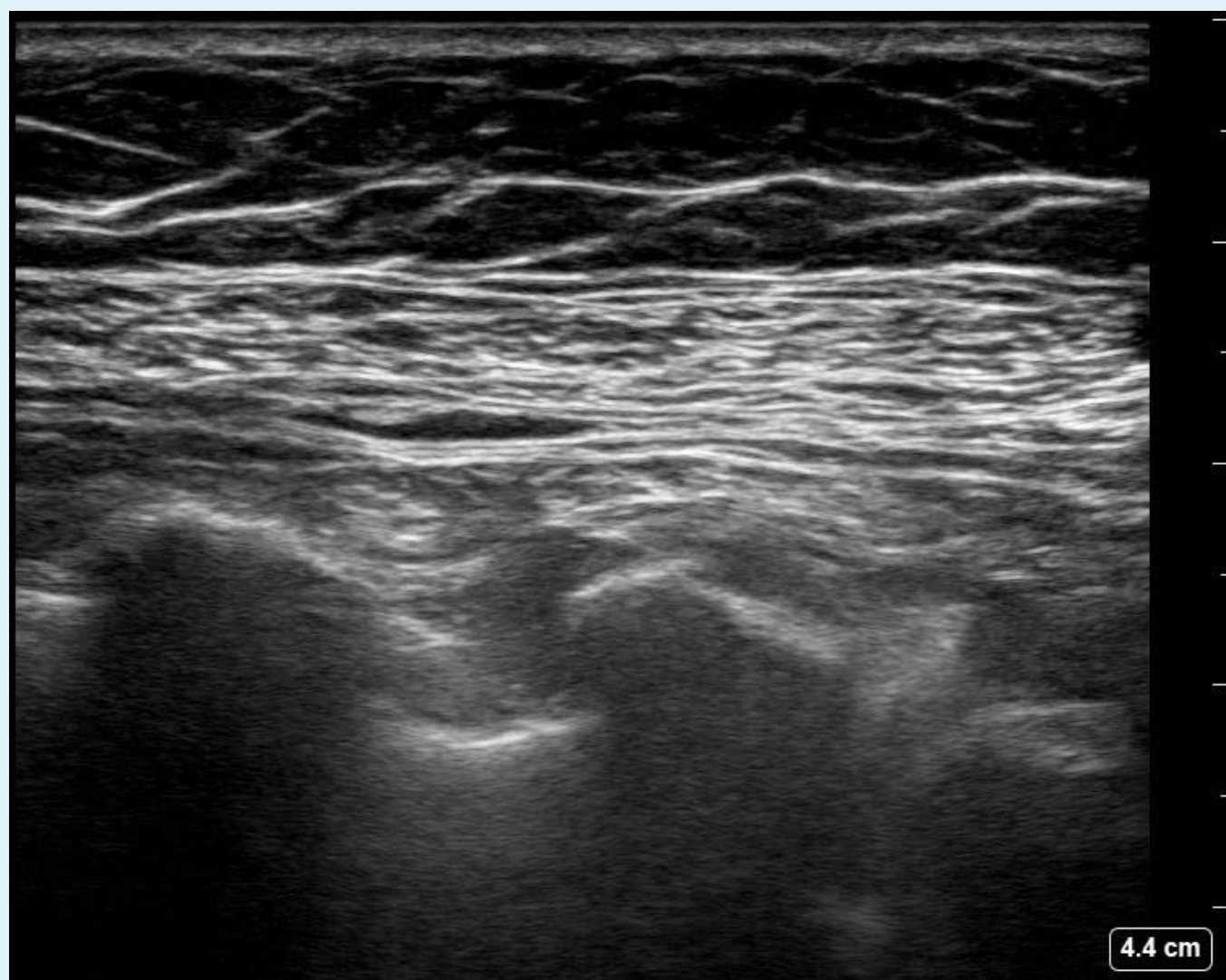


Fig 3a/b/c. Ultrasound imaging showing anatomy prior to PEC block/ Ultrasound imaging showing needle and anesthetic spread/ Ultrasound image showing needle and anesthetic spread with false-color overlay. (Abbreviations: PMj - Pectoralis Major, PMn - Pectoralis Minor, ISM - Intercostal Muscle, Pl. - Pleura)

Paravertebral Block with Liposomal Bupivacaine for Enhanced Recovery in Open Thoracotomy: A Case Report

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Introduction

It is well known that acute pain after an open thoracotomy can be associated with increased risk of postoperative complications as well as high incidence of development of chronic pain (1). Catheter-based regional analgesia has been a cornerstone of pain management after open thoracotomy. Various regional analgesia techniques, such as TEA, PVB, ESP, and intercostal blocks had been successfully utilized for this purpose. Liposomal Bupivacaine (LB) injection, which can last for several days (2), presents a potentially superior analgesic option with simplicity of a single shot block and a duration of action similar to a catheter-based technique. We have previously reported using ESP with LB and PECS I/II blocks as part of multimodal protocol for robotic thoracic surgery(3). In this medically challenging case, paravertebral blocks with LB and PECS I/II blocks were utilized as part of a multimodal approach for postoperative pain management after an open thoracotomy.

Case Description

A 77-year-old, 59kg woman with past medical history significant for bilateral breast cancer, status post bilateral mastectomy with chemotherapy, presented with left upper lobe adenocarcinoma for left thoracotomy, left upper lobectomy and possible pneumonectomy. Other notable comorbid conditions included hypertension and hyperlipidemia. Of importance, the patient disclosed having a severe intolerance to long-acting opioids with GI distress to both hydromorphone and morphine. After a thorough discussion, the patient consented to both paravertebral and pecs blocks.

After administering intravenous midazolam 2 mg and positioning in the sitting position by the operating team, left-sided PVB were performed at the T-5 and T-7 levels using a landmark-based method (4). An admixture of 4cc of 1.3% liposomal bupivacaine and 4cc of bupivacaine 0.25% was injected at both levels. After performance of the PVB, general anesthesia was induced with propofol 150 mg and rocuronium 50 mg.

Case Description (continued)

Intubation with a left sided double-lumen endotracheal tube was facilitated by administering 4ml of aerosolized 4% lidocaine to the vocal cords under direct visualization. Anesthesia was maintained with intravenous dexmedetomidine 0.4 mcg/kg/hr and ketamine 15 mg/hr. Ultrasound-guided Pecs II blocks was performed after the induction of general anesthesia using high frequency (15–6 MHz) linear array probe of SonoSite X-Porte® ultrasound (US) system (FUJIFILM SonoSite, Bothell, WA, USA). The technique used was in accordance with the description by Blanco (5). The patient in the supine position, with the arm abducted 90 degrees. The probe was placed below the clavicle, located the axillary artery on the US in the paramedian sagittal plane. The transducer was rotated slightly and moved laterally. 30ml 0.25% Bupivacaine mixed with 5 mg PF Decadron were injected as follows: 20 ml injected between the serratus anterior muscle and forth rib and 10ml between pectoralis major and pectoralis minor muscles as the needle was withdrawn. The block was performed by using a 22-gauge, 4inch needle Stimuplex® Ultra (B. Braun Medical Inc., Pennsylvania, USA). After successful completion of PVB and Pecs II blocks, left upper lobectomy via open thoracotomy approach was performed. Intravenous acetaminophen 1000mg was given at the end of the procedure. Shortly thereafter, the patient was extubated and transferred to the post-anesthesia care unit with no report of pain. She was given scheduled acetaminophen, per surgical protocol, during her hospital course. Her pain scores using the visual analog scale ranged between 0 and 4 for the entirety of her hospital stay. She required no IV opioids and took 7 tramadol 50mg tablets (1 on POD0, 3 on POD1, 1 on POD2, 2 on POD4) during the hospitalization. She was discharged home on postoperative day 5.

Postop Day	Pain Score	Opioid Consumption	MEQ	Cumulative MEQ
0	0	None	0	0
1	0	None	0	0
2	0	None	0	0

Discussion

There are several published reports of LB use in intercostal blocks.(6) Although LB has not been FDA approved to be used for PVB, a recently published retrospective review compared LB with 0.25% bupivacaine and epinephrine in PVB post-thoracic surgery. (7). They concluded that "LB paravertebral blocks provide effective analgesia in patients undergoing thoracotomies" (7). Their blocks were performed in the OR under direct visualization. Our case is the first reported case of LB use in thoracic paravertebral block without direct visualization. We added a Pecs block for pain relief from the apical chest tube. It is also important to note that the anesthetic regimen included the preemptive analgesic administration of dexmedetomidine and ketamine, which helped to reduce the patient's perioperative opioid requirements. The potential that this multimodal anesthetic approach using catheter-free regional analgesia may hold for significantly improving postoperative pain control in this patient population warrants further investigation.

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