

Introduction

- Surgeries involving the chest wall are among the most painful procedures performed, and carry high risk for chronic pain [1]. Effective pain management helps to promote optimal pulmonary function and avoid complications such as respiratory failure and pneumonia [2].
- Intercostal nerve blocks often involve multiple injections which can be time-consuming [3]. Pneumothorax can occur with both intercostal and paravertebral blockade [3]. Anticoagulation risks, nerve damage, and significant hemodynamic shifts are additional drawbacks associated with paravertebral and neuraxial blockade.
- Serratus anterior plane block (SAPB) is a novel block with utility for breast procedures, thoracotomy, and rib fracture analgesia. We describe a case where SAPB was used effectively for analgesia following a chest wall malformation resection.

Case Description

- A 13-year-old boy, 39.6kg, presented for resection of a right scapular vascular malformation given difficulty laying and sleeping on the mass. He has history of PTEN germline mutation, multiple thoracic and abdominal arteriovenous malformations, a large inferior vena cava aneurysm, and was on twice daily Enoxaparin for venous thromboembolism (VTE) prophylaxis.
- He underwent general anesthesia, and after a 10cm incision, the mass was found directly on the chest wall below the latissimus dorsi and serratus muscle. Part of the intercostal muscle was also resected. A 15x8x4cm soft tissue mass was mobilized and removed.
- Intraoperatively, he received Fentanyl 100mcg, Propofol 100mg, Dexmedetomidine 8mcg, Ketamine 20mg, and Acetaminophen 571mg. While supine, a linear array ultrasound transducer (15-6 MHz) was placed across the right mid-axillary line at the level of the fifth rib, where latissimus dorsi was identified.

Images

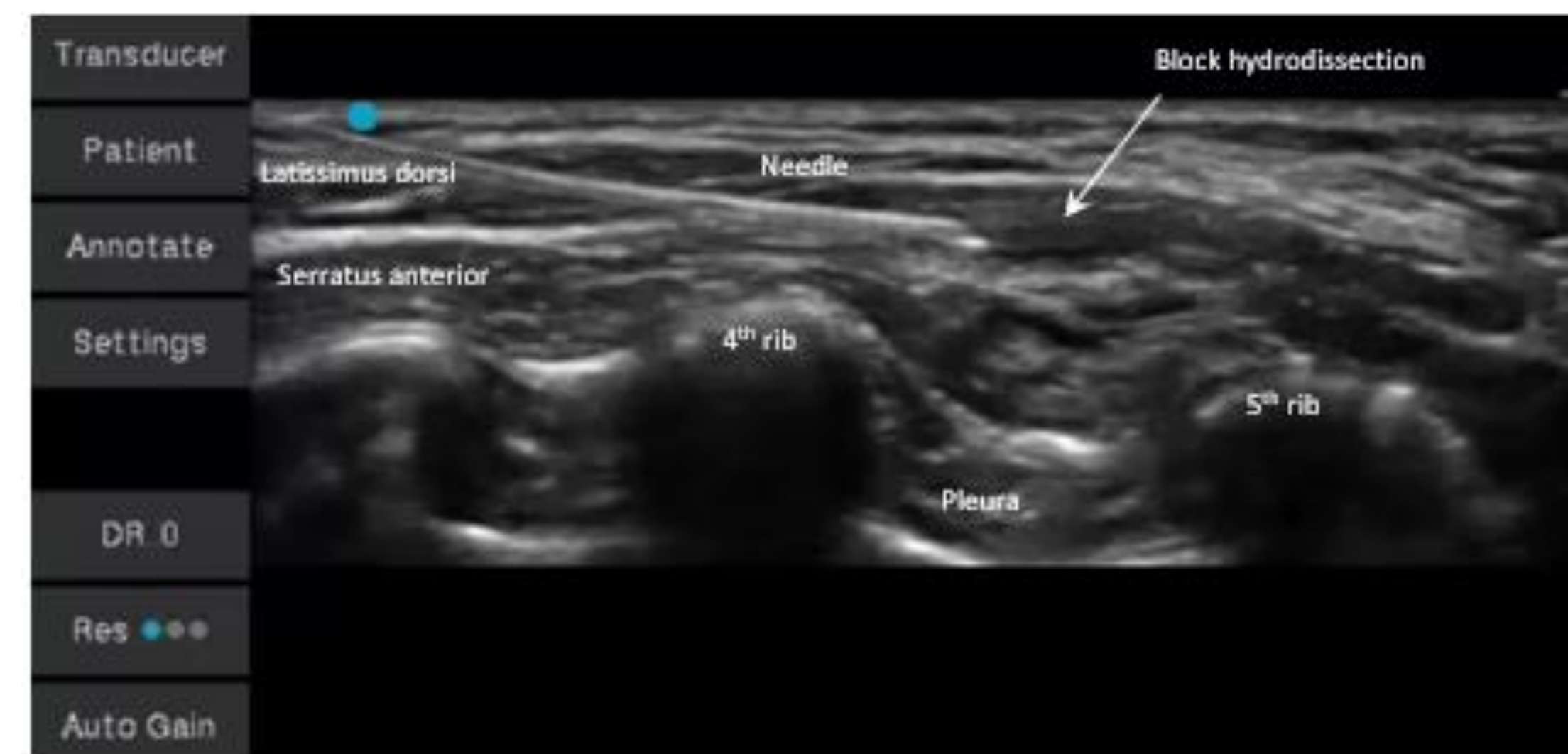
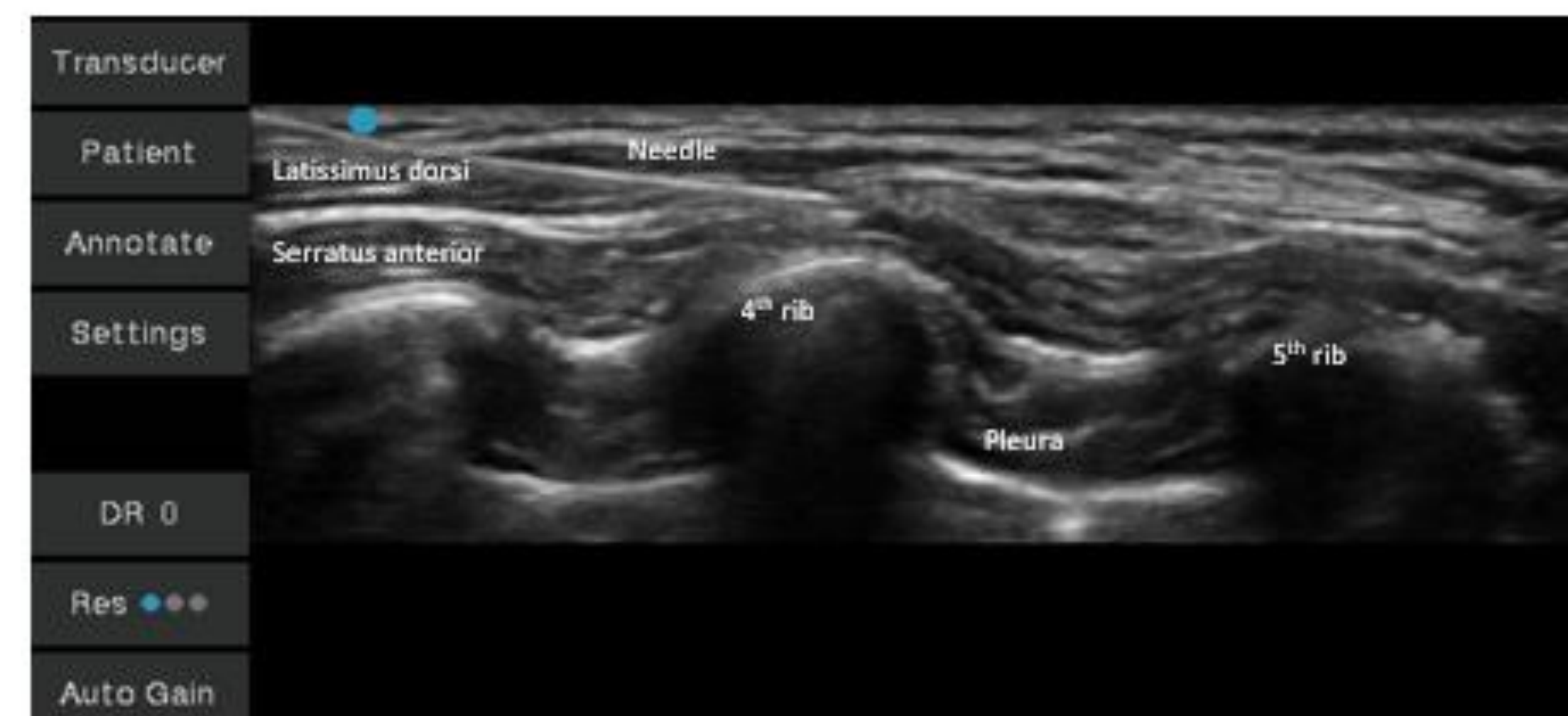


Figure 1. Serratus anterior plane block anatomy, with thoracodorsal artery positioned superficial to the serratus muscle (top); view before hydrodissection (middle); view after hydrodissection above the serratus muscle (bottom).

Case Description (Continued)

- A 22 gauge 80mm Sono TAP Pajunk needle was advanced from supero-anterior to postero-inferior direction into the fascial plane above the serratus anterior muscle (SAM), where 15cc of 0.5% Ropivacaine and 70mcg of Clonidine were administered [Fig 1]. Pain control postoperatively was excellent with zero on numeric rating scale (mean 0.37), with minimal requirements for p.r.n intravenous and oral pain medications. He was discharged on postoperative day 1 and was able to resume Enoxaparin.

Discussion

- Traditional pain control options for patients with chest wall surgeries are associated with multiple side effects, complications, and anticoagulation limitations.
- SAM is a superficial and easily identifiable target on ultrasound. When close to the mid-axillary line, the lateral cutaneous branch of the intercostal nerves pierces the SAM to innervate the thorax musculature [2].
- Injecting anesthetic solution into the fascial plane just superficial to the SAM could provide analgesia to posterolateral chest wall surgical pain comparable to paravertebral or epidural blocks. SAPBs are simple to perform, less invasive, and can serve as an effective alternative to provide analgesia, reduce opioid usage, and help avoid complications.

References

1. Kehlet, H., Jensen, T. S., & Woolf, C. J. (2006). Persistent postsurgical pain: risk factors and prevention. *The Lancet*, 367(9522), 1618-1625.
2. Durant, E., Dixon, B., Luftig, J., Mantuani, D., & Herring, A. (2017). Ultrasound-guided serratus plane block for ED rib fracture pain control. *The American Journal of Emergency Medicine*, 35(1).
3. Blanco, R., Parras, T., McDonnell, J. G., & Prats-Galino, A. (2013). Serratus plane block: a novel ultrasound-guided thoracic wall nerve block. *Anaesthesia*, 68(11), 1107-1113.