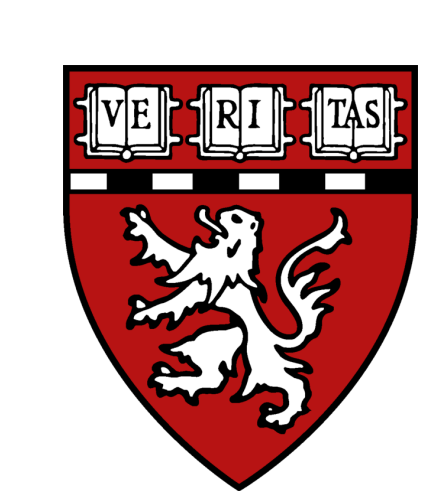




Superficial Parasternal Nerve Catheters and a Case of a Pericardial Effusion: Coincidence or Consequence?

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Introduction

- Regional interventions can be an invaluable tool to assist with acute postoperative pain in critically ill patients, particularly in opioid-tolerant patients.
- They can unfortunately be targets for fixation or anchoring with changes in clinical presentation.
- We will discuss an unlikely postoperative complication that was attributed to superficial parasternal intercostal plane nerve catheters.

Case Report

- 53-year-old male, PMH: COPD, chronic pain, and CKD IV who was found to have an acute type A aortic dissection and underwent replacement.
- Pain regimen: oxycodone PO 20-25 mg q3h PRN, hydromorphone 0.3-0.5 mg q6h PRN, extended-release morphine sulfate 30 mg TID, acetaminophen 650 mg q6h, and tizanidine 2 mg qhs.
- Acute pain service (APS) started a ketamine infusion 5 mcg/kg/min and a high dose hydromorphone patient-controlled analgesia pump.
- Nerve blocks were offered.
- Patient was on an IV heparin infusion, which was stopped for 5 hours prior to placement.
- Bilateral superficial parasternal intercostal plane catheters were placed.
- No complications were noted during the procedure. The nerve catheters infused 8 mL/hr of 0.1% bupivacaine bilaterally, and the patient received significant pain relief.
- Heparin infusion was restarted 2 hours after block completion.
- 14 hours after placement, patient had worsening dyspnea, hypoxia, lethargy, oliguria, and an acute increase in his liver function enzymes to >1,000.
- Bedside TTE revealed a pericardial effusion without tamponade.
- He was taken to the OR for a subxiphoid window creation and chest exploration.
- The surgical team voiced concern that they had a high degree of suspicion that the catheters were the cause of the effusion. Intraoperative findings: "Large clot over RV/RA. No active bleeding was found."
- The reported volume of blood evacuated was 2 liters. There was no chest hematoma: subcutaneous or intramuscular.
- The patient was returned to the ICU and made an uneventful recovery. His pain was managed with a combination of oral and IV PRN opioids, as well as morphine sulfate controlled-release.

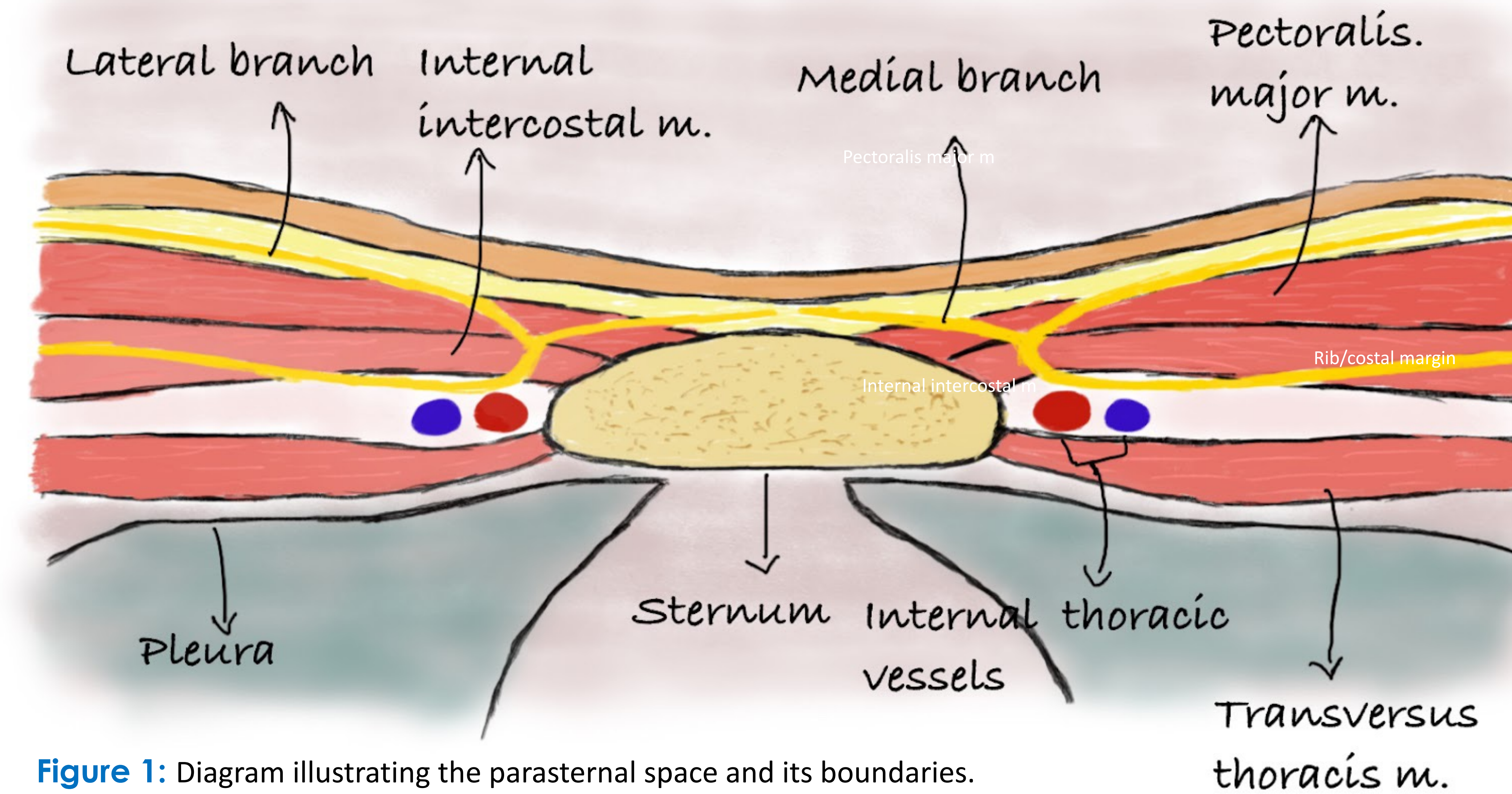


Figure 1: Diagram illustrating the parasternal space and its boundaries.

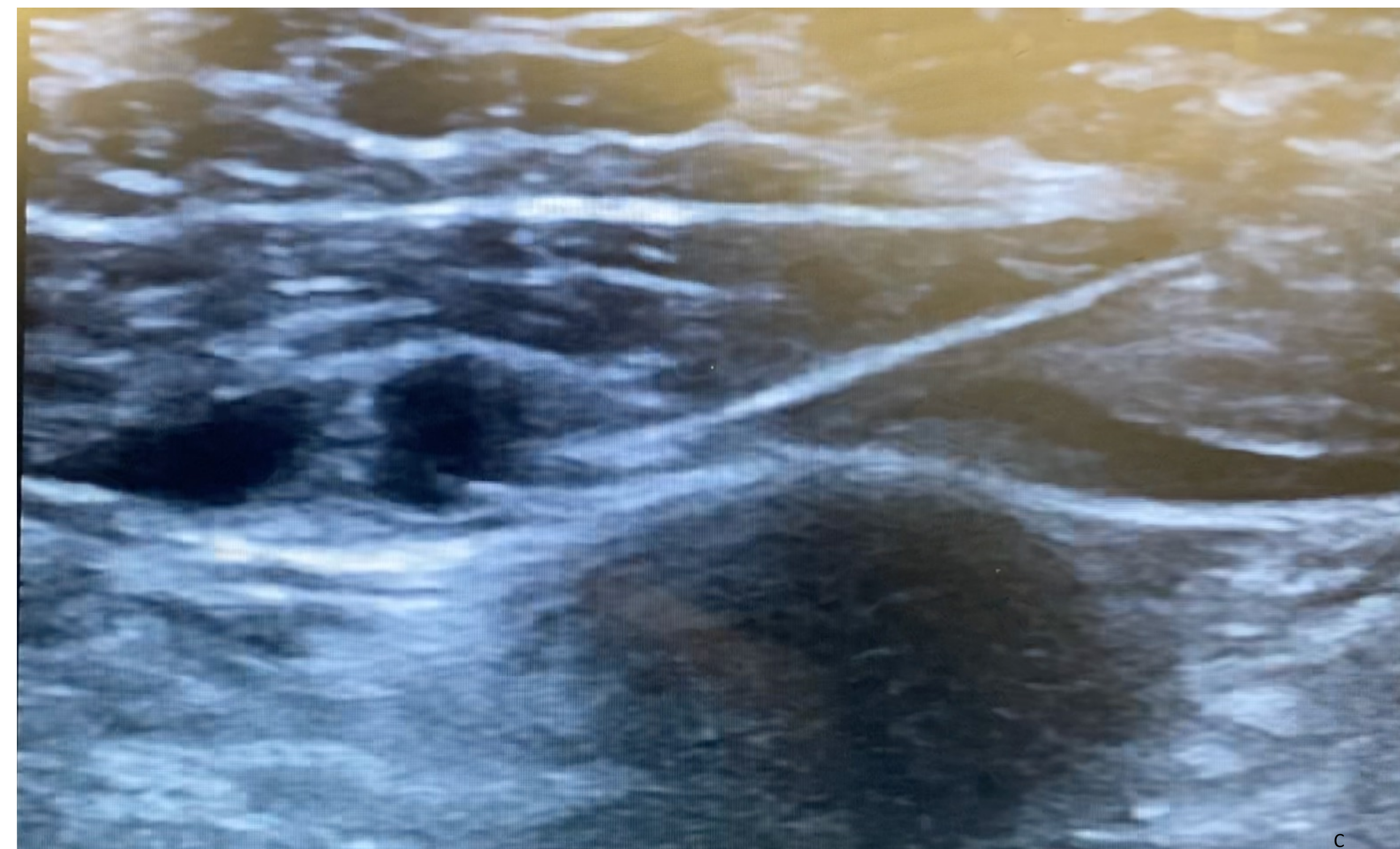


Figure 2: US-guided superficial parasternal block.

Discussion

- Parasternal blocks block anterior cutaneous branches of T2-T6 intercostal nerves located adjacent to the sternum.
- Relevant anatomy: pectoralis major m, internal intercostal m, internal mammary vessels, transversus thoracis m, and pleura.
- Cutaneous branches travel deep to the internal intercostal m and pass superficially to innervate the skin, subcutaneous tissue, and the periosteum of the sternum.
- Two approaches to this block: superficial and deep.
- Potential complications: pneumothorax, hematoma, infection, and local anesthetic systemic toxicity.
- The timing of the parasternal catheter placement with the subsequent decline in the patient's respiratory and mental status raised concern of their involvement.
- The pericardial effusion was likely gradually developing during his postoperative course.
- The patient was significantly orthostatic hours prior to the nerve block.
- It is highly unlikely that the superficial pecto-intercostal fascial block catheters were the cause of his pericardial effusion.

Conclusions

- Although the unlikely culprit, it is unfortunately common for regional interventions to be attributed to various, seemingly unrelated, symptoms that patients may present with.
- It is important to communicate with team members the expected outcomes, anatomy, and possible complications related to specific less common regional anesthesia interventions, particularly in the case of critically-ill patients.

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For full case
details and
discussion