

# Paravertebral Catheters for Post-Surgical Pain Management in a Bilateral Orthotopic Lung Transplant Patient

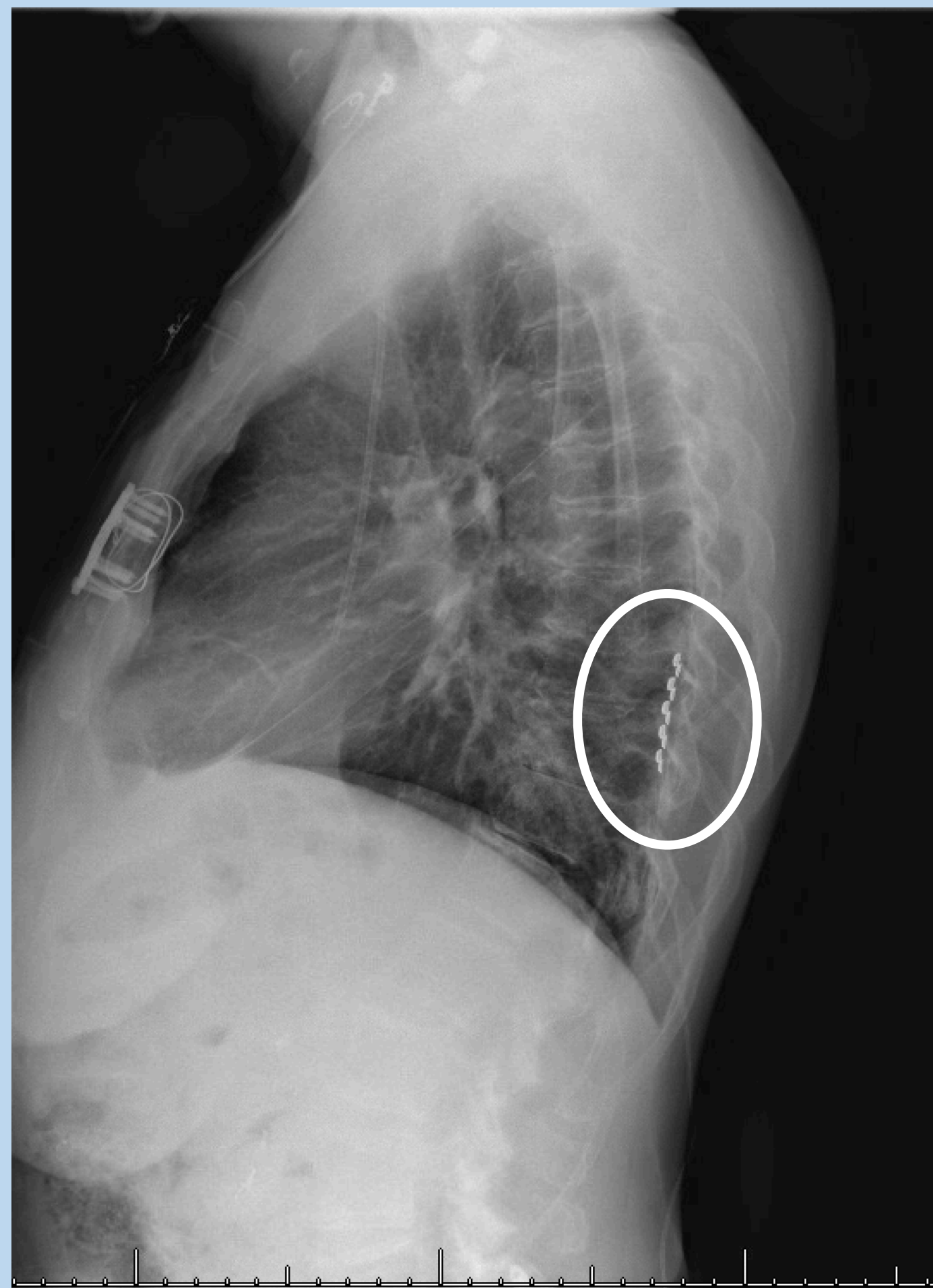
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## INTRO

- Providing effective post-operative analgesia for patients undergoing bilateral lung transplant is critically important in the prevention of subsequent complications. Acute pain after thoracotomy may decrease the ability to breathe deeply, cough, and clear secretions. When compounded, these factors may increase the risk for graft dysfunction, atelectasis, and hypoxemia.
- While thoracic epidural analgesia (TEA) remains the “gold standard” for pain control after lung transplantation, many factors can affect a patient’s ability to receive an epidural. Often anticoagulation status and coagulopathy preclude epidural placement, but in the case of prior thoracic spine surgery or implanted epidural device (spinal cord stimulator) paravertebral nerve block catheters can be placed for effective analgesia post-operatively.

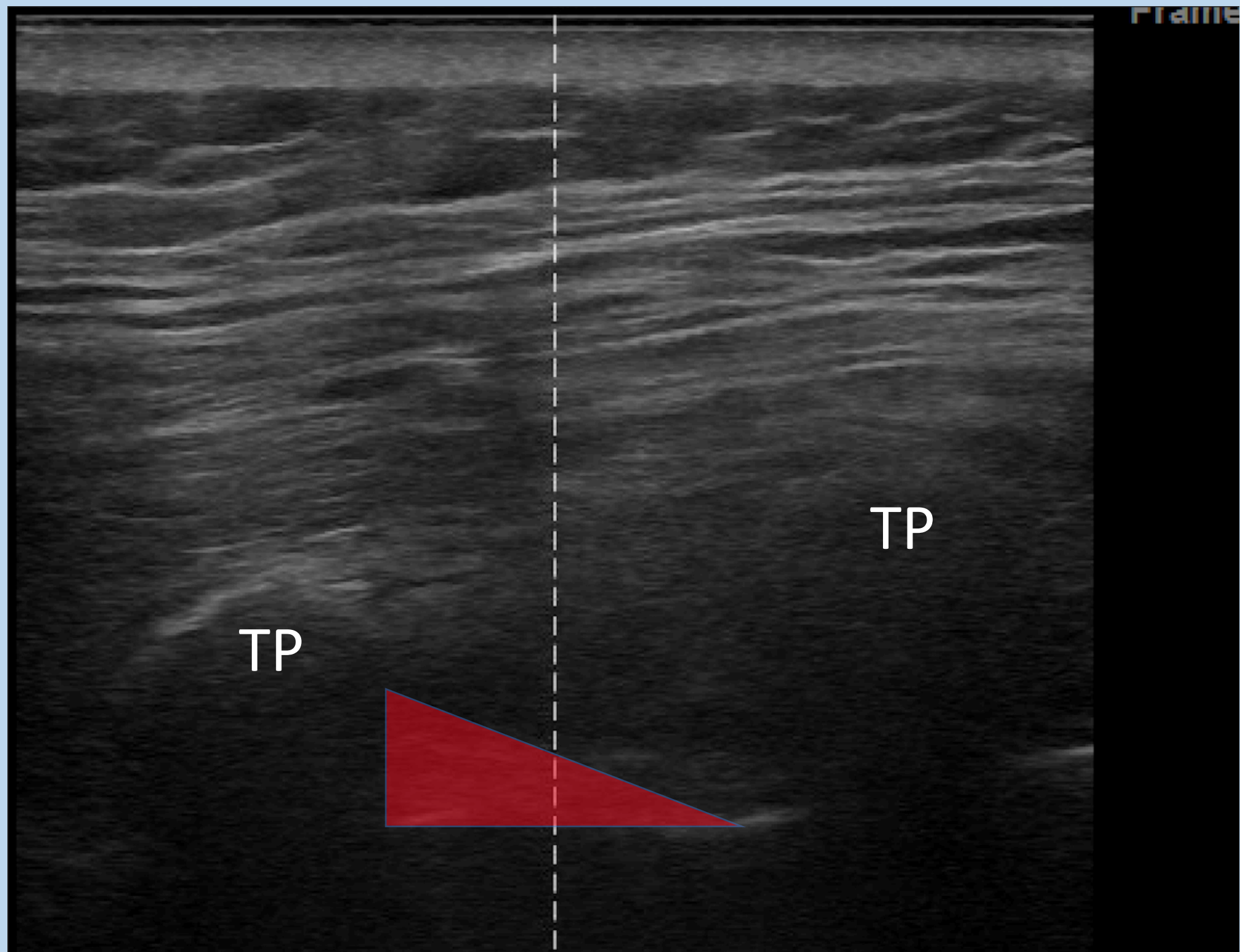
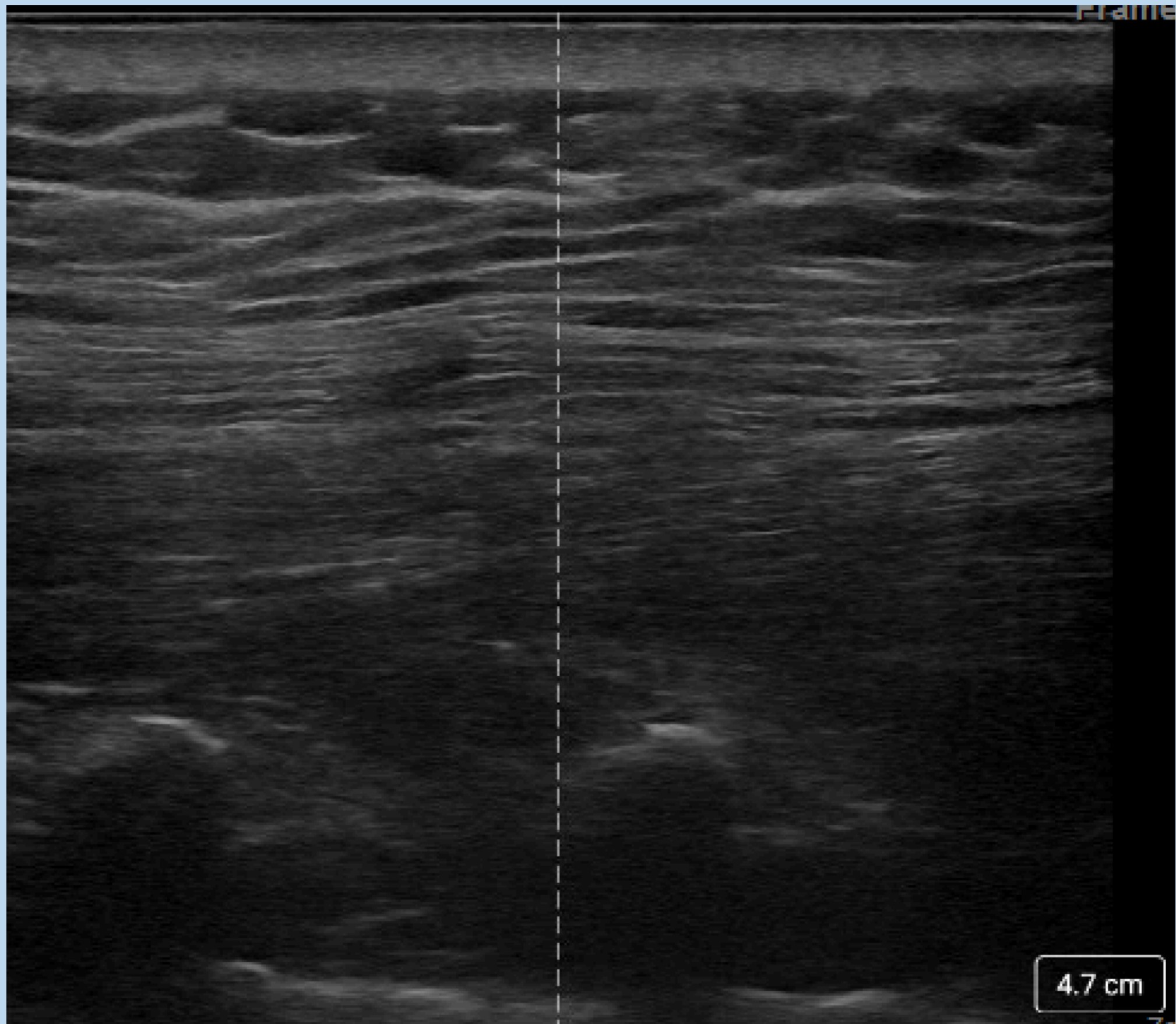
## CASE DESCRIPTION

- A 56 year old female with past medical history of pulmonary hypertension, obstructive sleep apnea, obesity, type 2 diabetes mellitus, fibromyalgia, and chronic back pain s/p L5-S1 fusion with a spinal cord stimulator in place presented for a bilateral lung transplantation in the setting of Covid pneumonia with refractory hypoxic respiratory failure. On postoperative day one, the patient reported worsening incisional pain, for which the acute pain service was consulted. Given her history of a spinal cord stimulator with lead extension to the T7 vertebral body, the decision was made to place bilateral T5-6 paravertebral catheters rather than thoracic epidural.



**Figure 1**  
Lateral radiograph demonstrating location of spinal cord stimulator in mid-thoracic epidural space.

**Figures 2 & 3**  
Ultrasound images during procedure. Out-of-plane technique used to place catheter via 18 G Touhy. In lower ultrasound image: TP: transverse process. Red triangle: paravertebral space below superior costotransverse ligament and above pleura.



## CASE DESCRIPTION CONT.

- The paravertebral space was accessed bilaterally with an 18-gauge Tuohy needle via ultrasound visualization. Bilateral 20-gauge polyamide multi-orifice catheters were placed within the space after administration of 15 mL of 0.25% bupivacaine. The procedure proceeded without complication. The catheters were dosed with Ropivacaine 0.2% 1 cc/hr infusion and 10 cc boluses every 4 hours.
- Over the subsequent days, the patient was able to breathe deeply, cough, and ambulate with reported pain scores of zero. Bilateral chest tubes removed post-op day 4. Catheters were discontinued on post-op day five after suspected intravascular migration occurred. The patient was successfully transitioned to oral analgesia and spinal cord stimulator was turned back on during post-op day five.

## DISCUSSION

- Several strategies exist to address post-surgical pain after bilateral lung transplant. However, in patients with contraindications to thoracic epidural analgesia (TEA), paravertebral catheters (PVCs) may provide an alternate analgesic option without compromising quality of pain control. Furthermore, paravertebral catheters may be associated with less hemodynamic effects, pulmonary complications, nausea and vomiting, and urinary retention postoperatively. Future efforts should be aimed toward direct comparison of outcomes in post-transplant patients with PVCs versus TEA.

## REFERENCES

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