

Don't Get Caught in the Web: A Multicatheter Approach to Treat Bilateral Rib Fractures in the Setting of a Thoracic Arachnoid Web



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Introduction:

- Neuraxial anesthesia is a cornerstone of pain management in the perioperative and trauma settings. However, contraindications need to be carefully considered.
- In this case of a patient with bilateral rib fractures and an incidental discovery of a thoracic arachnoid web, we utilized alternative strategies for pain control.

Case Presentation:

- A 65-year-old female who was a restrained driver in a motor vehicle accident presented with left-sided chest wall pain, back pain, and numbness in her feet immediately after the collision.
- On evaluation, imaging revealed multiple nondisplaced rib fractures, including the left anterior fifth through eighth ribs, as well as the right posterolateral eighth through tenth ribs. MRI showed a T5 arachnoid web (Figure 2).

Regional Anesthesia for Rib Fracture Pain in a Patient with a Symptomatic Thoracic Arachnoid Web

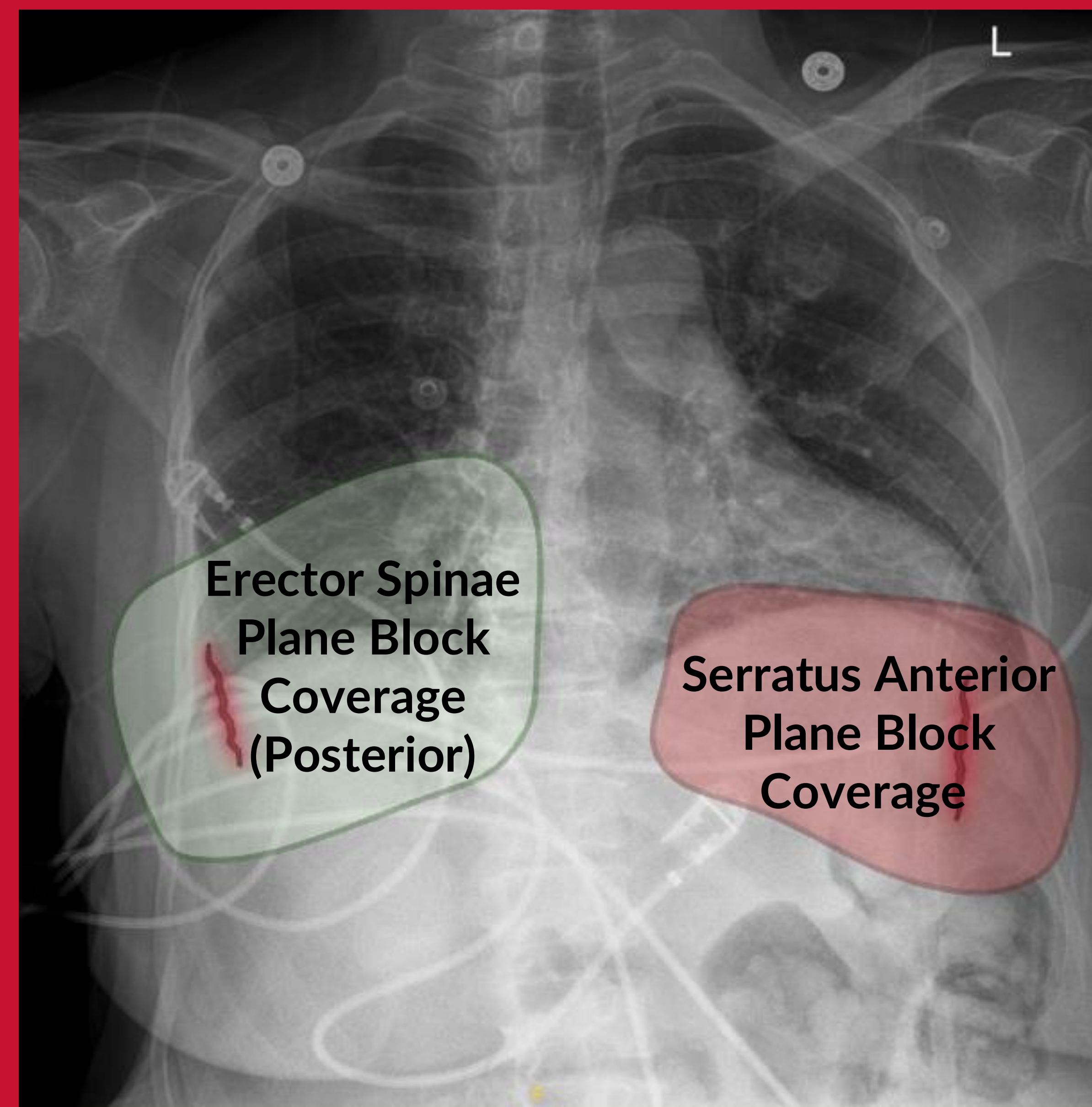


Figure 1. Chest x-ray showing general location of rib fractures and coverage of performed nerve blocks



Figure 2. Thoracic MRI
"scalpel sign"



Figure 3. Arachnoid web graphic
Courtesy of Neupsykey. "Dorsal thoracic arachnoid abnormalities." (2019)

Regional Anesthesia Considerations for Arachnoid Webs

Unpredictable Spread of Anesthetic – Arachnoid webs can disrupt CSF flow, leading to an unintended high or inadequate block.

Increased Risk of Neurologic Injury – Spinal cord compression due to the web can increase its vulnerability to damage from anesthetic toxicity or needle trauma.

Post-Dural Puncture Headache (PDPH) – If CSF leakage occurs near an arachnoid web, PDPH may be more severe due to altered pressure gradients.

Interference with Clinical Examination – Neuraxial anesthesia interferes with tracking the progression of neurological deficits.



Case Presentation (continued):

- The patient reported sternal and rib pain rated as 7/10 and demonstrated poor respiratory effort, achieving only 500 mL on incentive spirometry.
- Two nerve blocks were performed: A left T7 serratus anterior plane block and a right T9 erector spinae plane block, each with 20 mL of 0.5% ropivacaine. Peripheral nerve catheters (PNCs) were placed at each site and initiated at a rate of 0.2% ropivacaine at 7 mL/hr. A fentanyl patient-controlled analgesia pump was started.
- Within thirty minutes of block placement, the patient's pain improved to 3/10, and she was able to reach 2000 mL on incentive spirometry. Two days later, the PNCs were discontinued, and the patient was discharged home with plans for fenestration of T4-5 thoracic intradural arachnoid webbing.

Discussion:

- This case underscores the importance of recognizing contraindications to neuraxial anesthesia, particularly in patients with pre-existing neurological deficits and complex spinal pathology.
- Neuraxial anesthesia was avoided because the patient presented with bilateral numbness and a new incidental finding of a thoracic arachnoid web.
- The use of separate peripheral nerve catheters to target the patient's chest wall pain on each side individually provided adequate analgesia while preserving the ability to monitor neurological function and minimizing the risk of further compromising the spinal cord.

References:

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- Reardon, M. A., et al. "Dorsal thoracic arachnoid web and the "scalpel sign": a distinct clinical-radiologic entity." *American Journal of Neuroradiology* 34.5 (2013): 1104-1110.

