

Phrenic Nerve Involvement After Infraclavicular Block in a Trauma Patient: A Case Report

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Background

Brachial plexus blocks provide effective pain relief for upper extremity surgeries, reducing opioid use. The infraclavicular block is preferred for patients with respiratory concerns due to a lower risk of phrenic nerve involvement. However, rare cases of respiratory complications from phrenic nerve involvement following this block have occurred. This report examines one such case.

Case Report

A 45-year-old male with a history of polysubstance abuse was admitted following a motor vehicle collision, sustaining **LEFT**-sided rib fractures, pulmonary contusions, hemothorax, and a right distal radius fracture. After stabilization, he underwent an ultrasound-guided **RIGHT** infraclavicular block for pain management, using 20 mL of 0.5% ropivacaine, 100 mcg of dexmedetomidine, and 1:200,000 epinephrine.

Approximately 30 minutes post-block, the patient developed respiratory distress and oxygen desaturation (91% on room air). Given the respiratory concerns, the procedure was canceled, and he was monitored in the PACU with supplemental oxygen, improving his saturation. A chest X-ray revealed diaphragm elevation, indicating phrenic nerve involvement. His symptoms gradually resolved, and he was successfully re-scheduled for surgery using an axillary block, with no further respiratory issues.

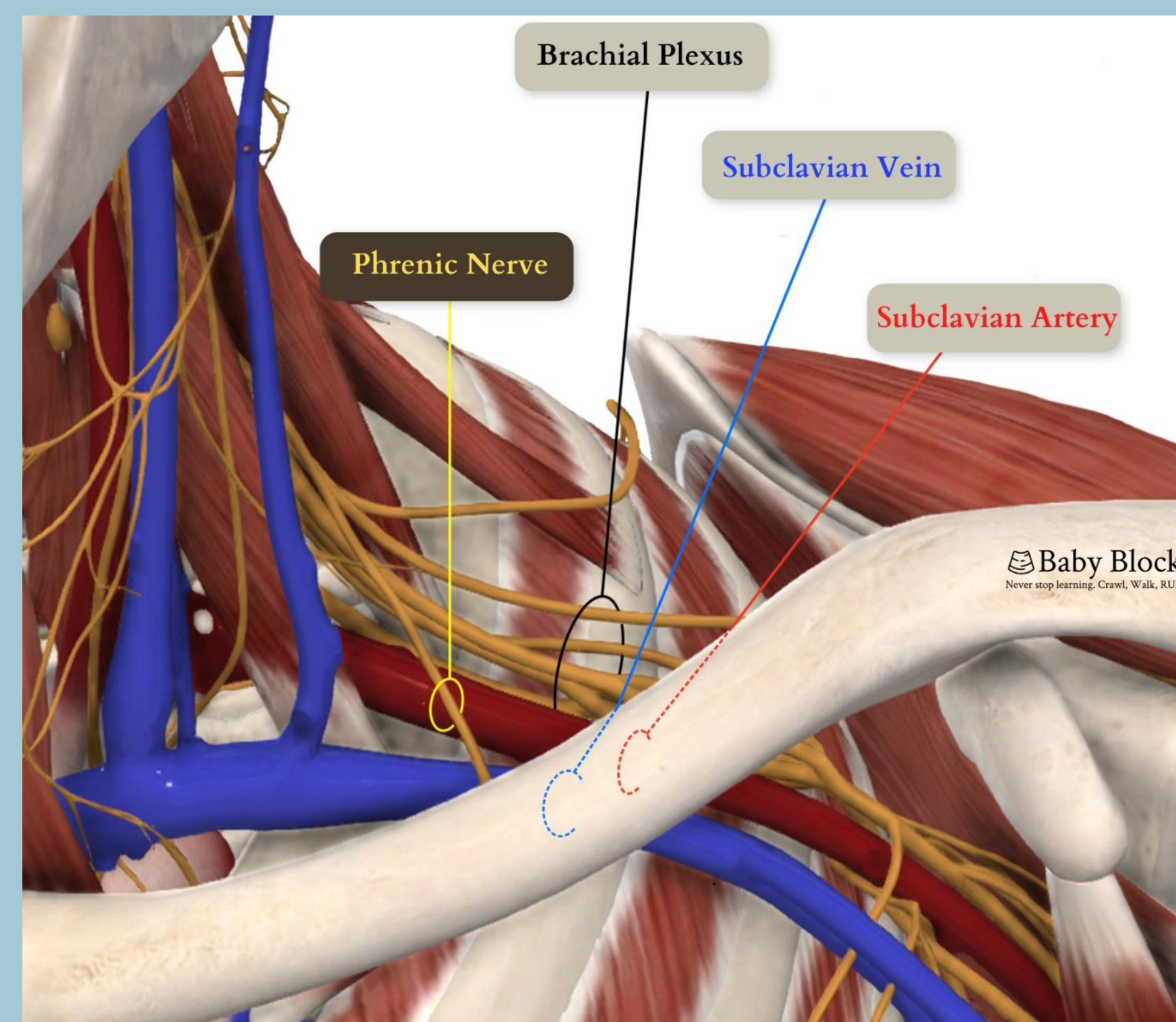


Figure 1: Anatomical Relationship between Phrenic Nerve and Brachial Plexus

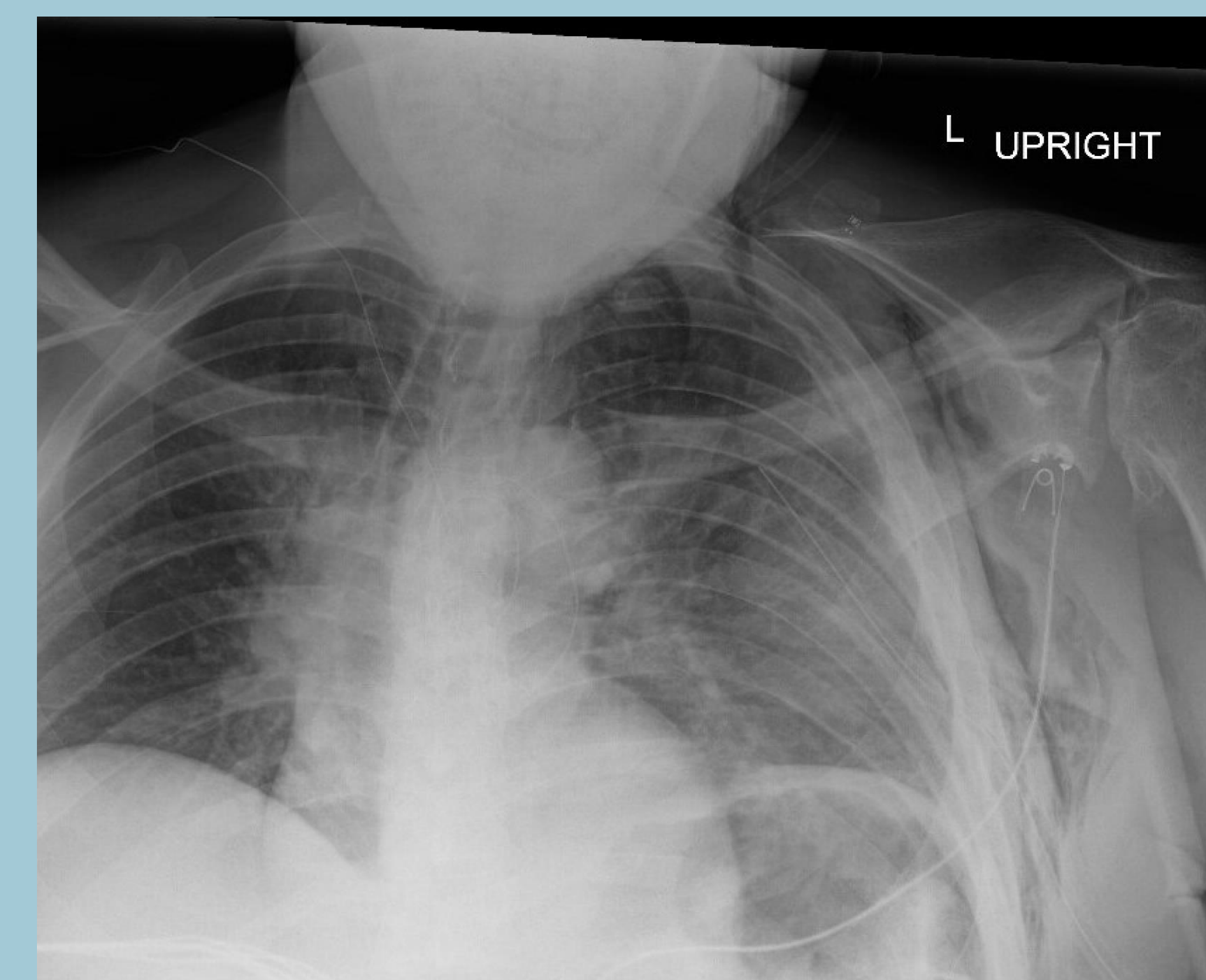


Figure 3: CXR of the patient upon arrival to hospital

FINDINGS: Left-sided chest tube is in place. Subcutaneous emphysema seen on the left. There is elevation of left hemidiaphragm. Multiple left-sided rib fractures are identified. Right lung is clear.

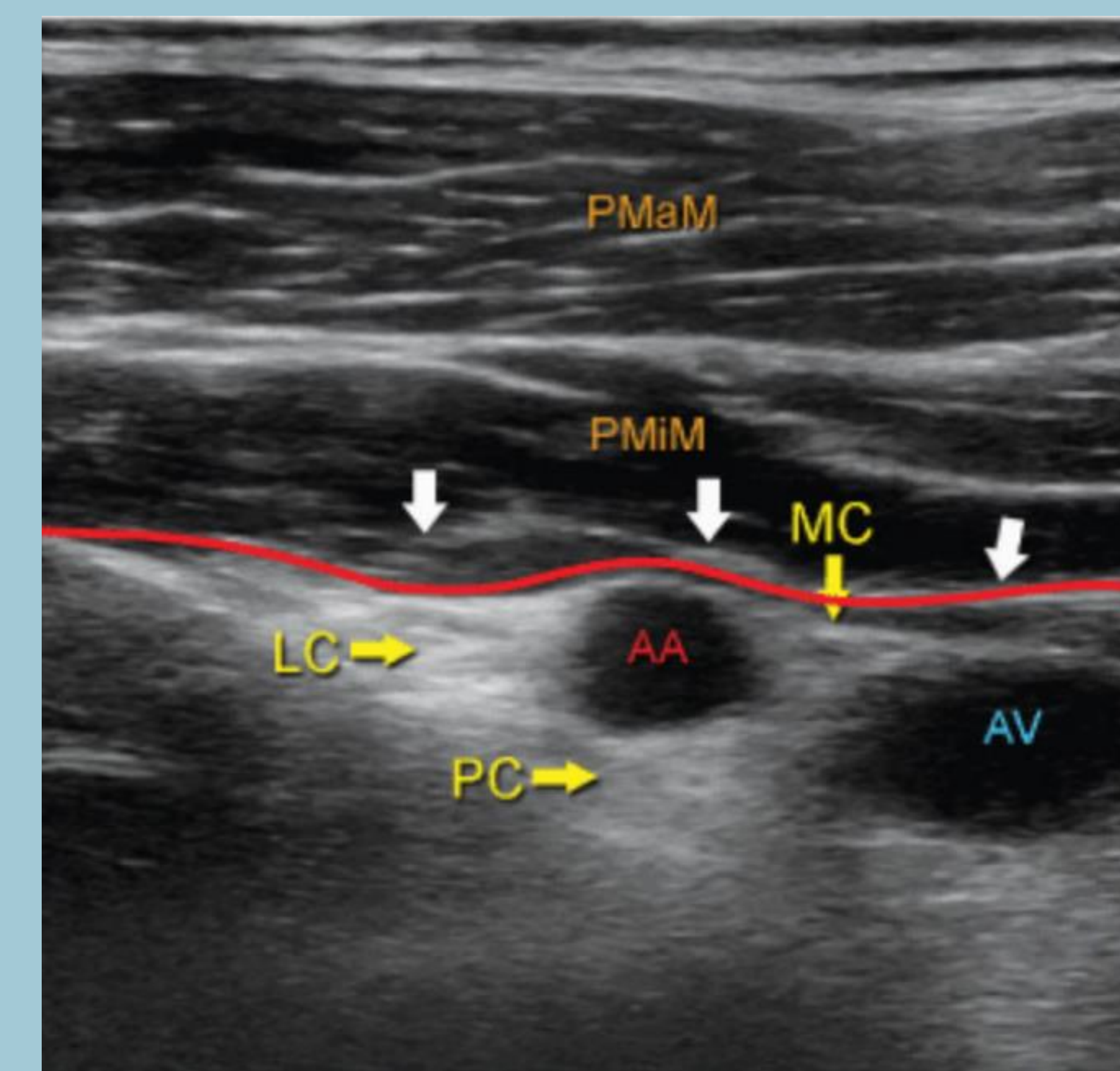


Figure 2: Ultrasound guided infraclavicular brachial nerve block

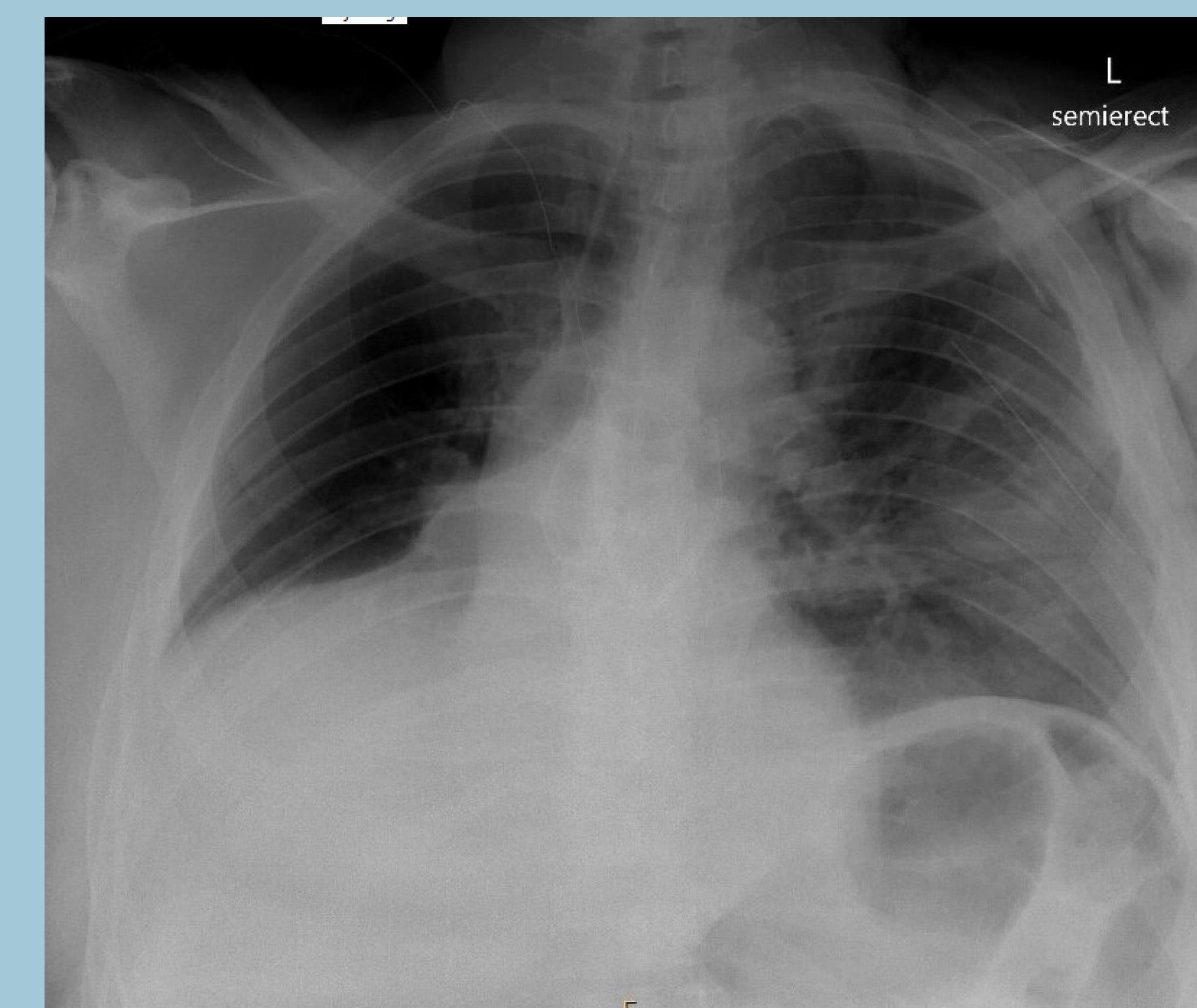


Figure 4: CXR of patient taken in PACU the following day, after case was cancelled for respiratory distress

IMPRESSION:
New right middle and right lower lobe atelectasis.

Discussion

Infraclavicular blocks are often preferred for patients with pulmonary concerns due to a lower risk of phrenic nerve involvement. However, this case demonstrates that even low-risk blocks can lead to unexpected complications. The patient's respiratory distress and diaphragm elevation suggest rare phrenic nerve involvement, possibly due to local anesthetic spread or individual anatomical factors, particularly given his significant left-sided thoracic injuries.

This case highlights the importance of vigilance when using techniques considered low-risk for respiratory issues. Clinicians must be ready to identify and manage potential complications, as shown by the decision to cancel the procedure and provide supplemental oxygen to stabilize the patient. It reinforces the need for close monitoring, especially in high-risk patients, to ensure regional anesthesia remains safe and effective.

References

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5. Figure 2: <https://aneskey.com/ultrasound-guided-infraclavicular-brachial-plexus-block/>