



Focus on POCUS: Improved Diagnosis for Pneumothorax



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Learning Objectives

- Review the epidemiology and etiologies for secondary pneumothorax.
- Understand the increased sensitivity of lung ultrasound compared to chest x-ray in the diagnosis of pneumothorax
- Understand the limitations of lung findings from POCUS

Case Description

- Patient R: an 85-year-old man with a history of COPD, OSA, and CAD
- Acute onset dyspnea on exertion when getting out of bed in the morning. Dyspnea slightly worsened throughout the day.
- Vitals: 97.2 °F, 80 BPM, 150/98 mmHg, 95% (RA)
- Pulmonary Exam: Unlabored breathing at rest. Tachypnea with talking and walking. No decreased breath sounds, rales, rhonchi, or wheezing
- Cardiac Exam: Normal S1 and S2, no rubs/murmurs/gallops

Laboratory Workup	
WBC (x1000/ μ L)	11.1
% Neutrophils	60
Troponin I (ng/mL)	0.00
BNP (pg/mL)	169
SARS CoV-2	Negative

Hospital Course



Figure 1 – Chest X-ray on admission

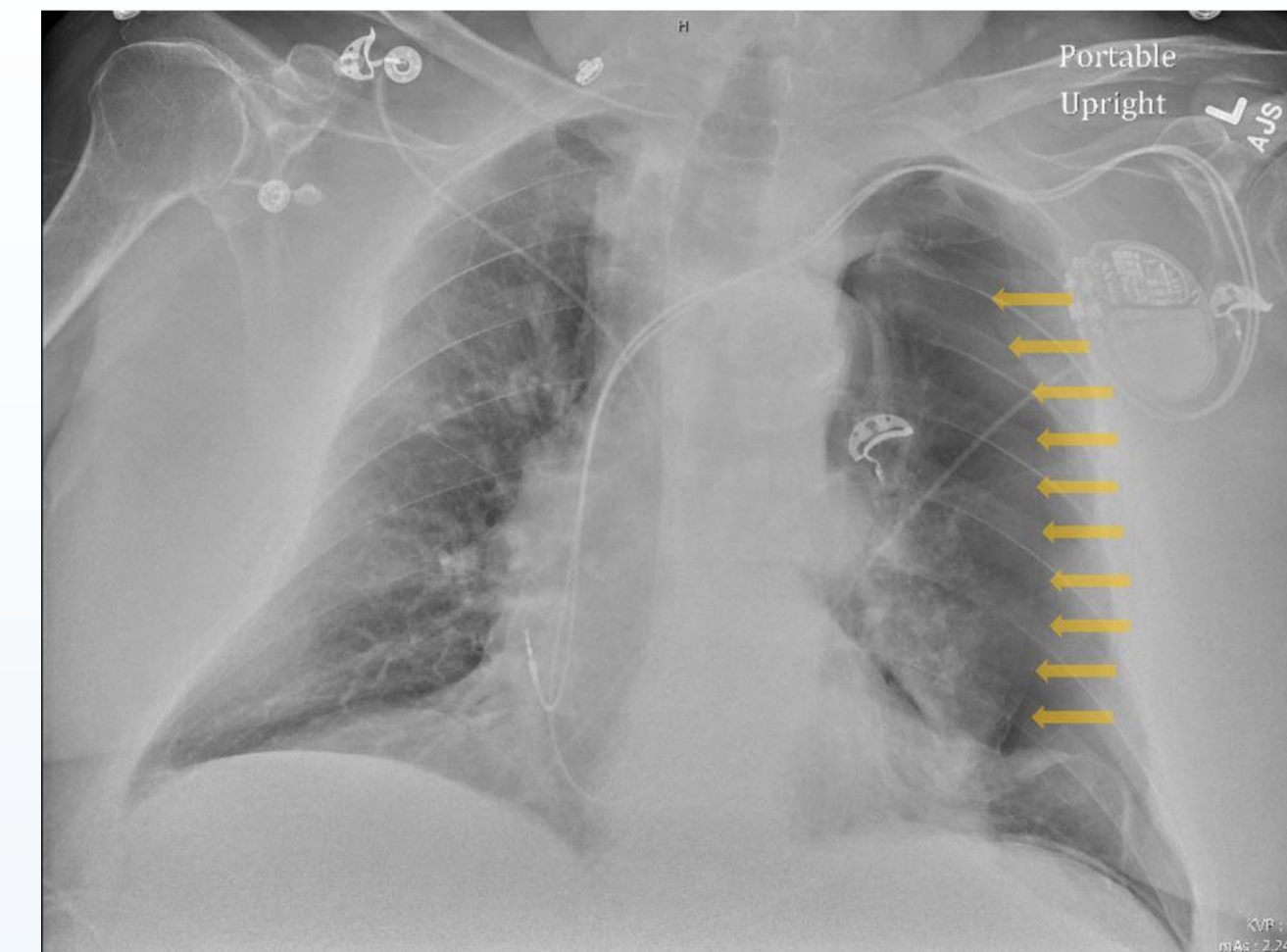


Figure 2– Chest X-ray 13 hours after admission

Care Timeline

- 00:00 – Arrival to the ED
- 00:40 – Chest X-Ray showing lingular and left retrocardiac opacities
- 01:45 – Administered doxycycline and ceftriaxone
- 03:30 – Arrival to the floor – resident-performed POCUS for educational purposes showed poor visualization of lung sliding on the left. Attributed to poor technique due to inexperience
- 06:00 – Started on BIPAP
- 12:00 – Patient began experiencing worsening shortness of breath. Exam revealed decreased left sided lung sounds
- 13:00 – Repeat Chest X-Ray showed moderate left sided pneumothorax without evidence of tension

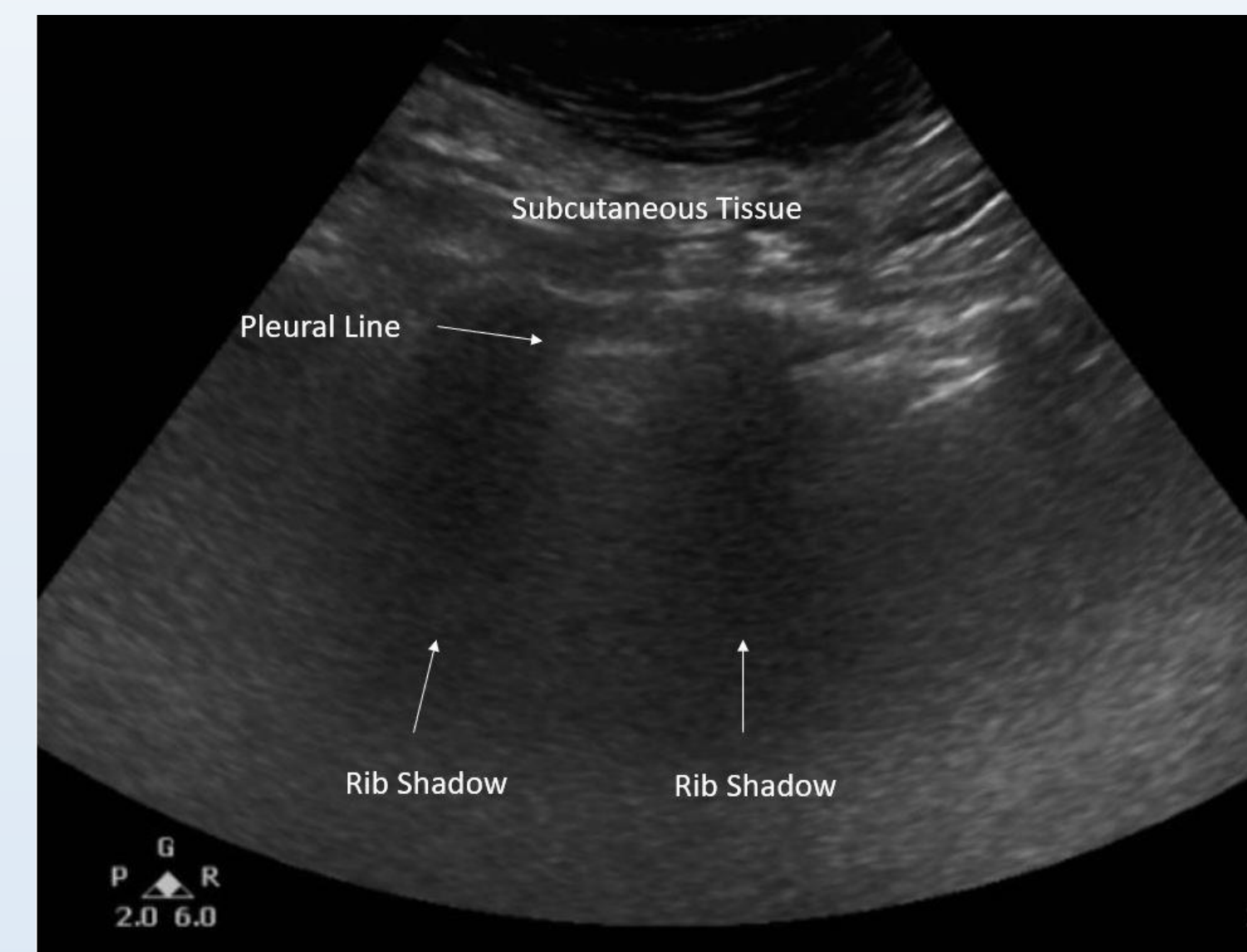


Figure 3– Example US of normal lung sliding

Discussion

- Incidence of secondary pneumothorax is 12 per 100,000. 4 in 5 of these cases have COPD
- While CXR is most often used to evaluate for pneumothorax, ultrasound is almost twice as sensitive for detection
- Positive likelihood ratio of ultrasound detecting pneumothorax is 87
- Accuracy is dependent on operator skill
- The initial normal CXR gave the team a false sense of security against a pneumothorax
- Lack of experience with POCUS prevented confidence in findings

Conclusions

POCUS training should be integrated into residency training, as it can lead to earlier diagnosis and more timely interventions.

Follow Up

Patient R had a chest tube placed with resolution of his pneumothorax. Three months later, he had recurrence which required pleurodesis

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