

AMSER Case of the Month: March 2020

68 y/o male with acute onset SOB

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Patient Presentation

- CC: Shortness of breath
- HPI: Acute onset SOB starting around 5am after a coughing fit. -CP, -fever, -recent illness, -trauma. EMS gave albuterol nebs during transport and trialed CPAP with moderate relief. SOB and diaphoretic on arrival to ED.
- PMH: Stage 1 NSCLC of left lower lobe s/p surgery/radiation/chemo, prostate cancer, COPD, CKD, chronic back pain 2/2 herniated disc, GERD
- PSH: lobectomy of LLL(2013), prostatectomy
- Meds: pantoprazole 40 mg daily, oxycodone 5 mg Q4 PRN, tizanidine 2mg Q6 PRN, albuterol inh MDI PRN
- Social Hx: Former smoker (5 pack year hx), -ETOH, -Drug use
- PE: +appears distressed & diaphoretic, +rhonchi/wheezes in bilat lower lobes and diminished breath sounds throughout, +tachypneic with increased WOB. Tachycardic in 120s
- Vitals: 113/70, RR 28, HR 122, SpO2 78% on RA, T 98.7

Pertinent Labs

Results		CBC 1/27/2020 5:33 AM	
	VALUE		
WBC	7.53		
RBC	5.37		
HEMOGLOBIN	12.8	↓	
HEMATOCRIT	40.9	↓	
MCV	76.2	↓	
MCH	23.8	↓	
MCHC	31.3	↓	
RDW	16.4	↑	
PLATELET COUNT	171		
MPV	10.0		
NRBC	0.0		

Results		BASIC METABOLIC CHEMISTRY PANEL 1/27/2020 5:33 AM	
GLUCOSE	179	↑	
BUN	18		
CREATININE	1.53	↑	
SODIUM	141		
POTASSIUM	3.6		
CHLORIDE	103		
CO2	23		
CALCIUM	9.6		
ANION GAP	15		
EGFR	45		
EGFR AFRICAN AMERICAN	55		

Results		BLOOD GAS, VENOUS 1/27/2020 5:33 AM	
PH VENOUS	7.31	↓	
PCO2 VENOUS	49		
PO2 VENOUS	30		
HCO3(CALC), VENOUS	22		
O2 CONTENT VENOUS	9		
TEMP, VENOUS	98.6		
TCO2(CALC), VENOUS	52	↑	

Results		PROTIME-INR 1/27/2020 10:54 AM	
STATUS	Final result	VISIBLE TO PATIENT	Yes (MyCooper)
		VALUE	
PROTHROMBIN TIME		12.4	
INR		1.1	

What Imaging Should We Order?

ACR Appropriateness Criteria

Date of origin: 2000
Last review date: 2015

American College of Radiology ACR Appropriateness Criteria®

Clinical Condition: Routine Chest Radiography

Variant 1: No clinical concern on basis of history or physical examination.

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest routine preoperative	3		⊗
X-ray chest routine admission	3		⊗
X-ray chest routine outpatient	2		⊗
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

Variant 2: Suspicion of acute or potentially unstable chronic cardiopulmonary disease by history or physical examination.

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest routine admission	9		⊗
X-ray chest routine preoperative	8		⊗
X-ray chest routine outpatient	8		⊗
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

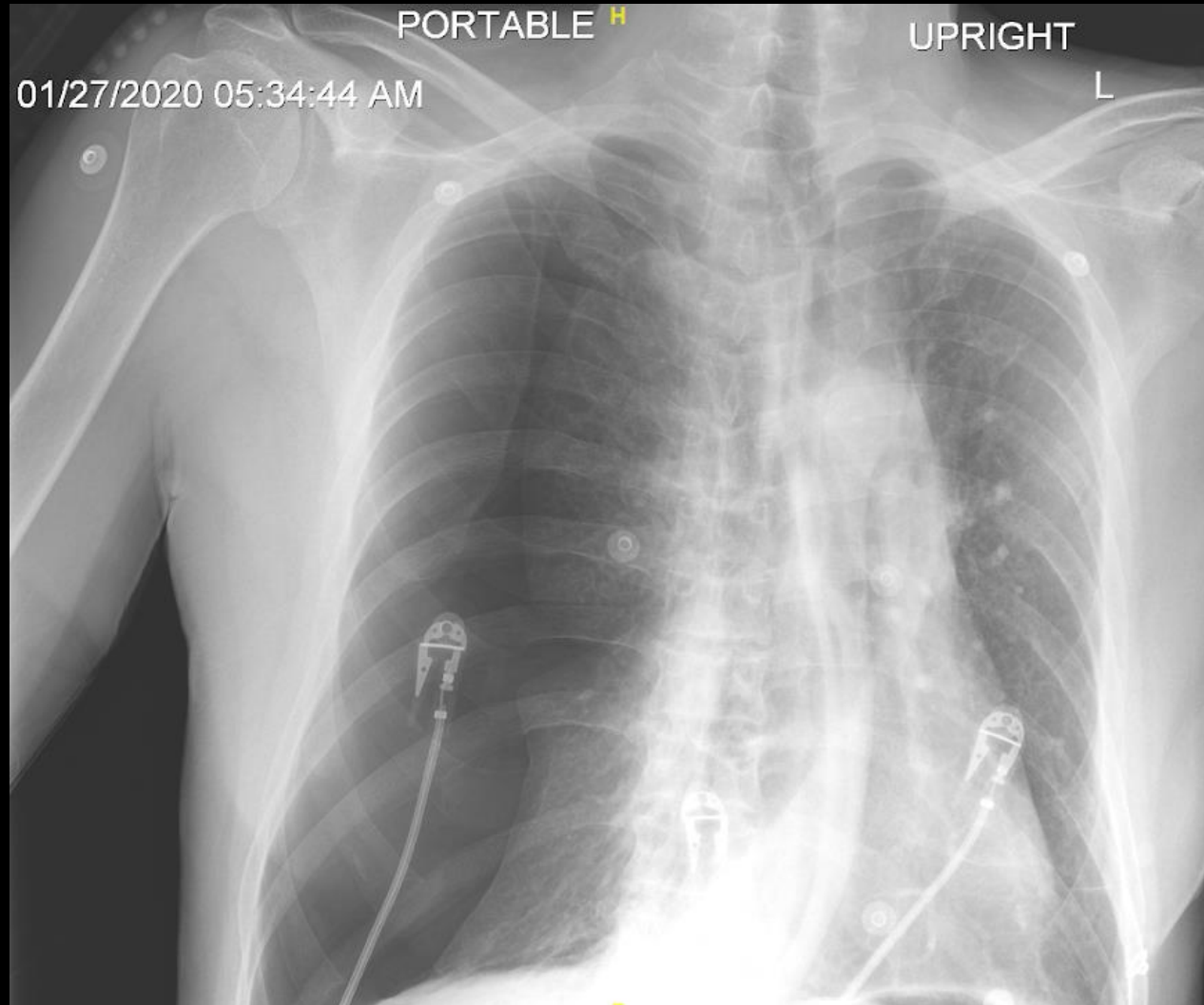
Variant 3: Increased risk, patient- or procedure-related (ie, advanced age [particularly >70 years], unreliable history and physical examination, high-risk surgery).

Radiologic Procedure	Rating	Comments	RRL*
X-ray chest routine preoperative	7		⊗
X-ray chest routine admission	7		⊗
X-ray chest routine outpatient	6		⊗
Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate			*Relative Radiation Level

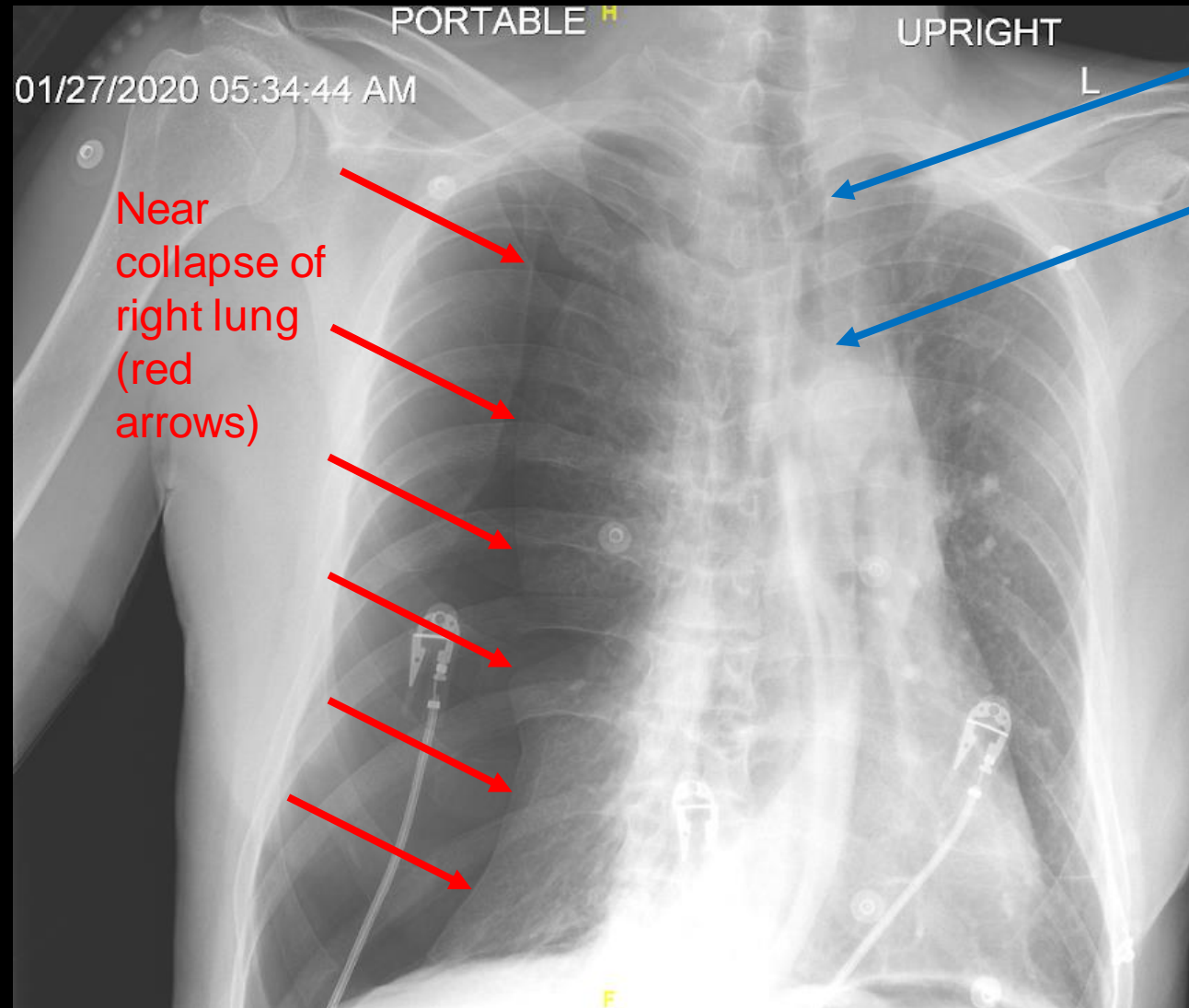
This imaging modality was ordered by the ER physician



Findings (unlabeled)



Findings: (labeled)



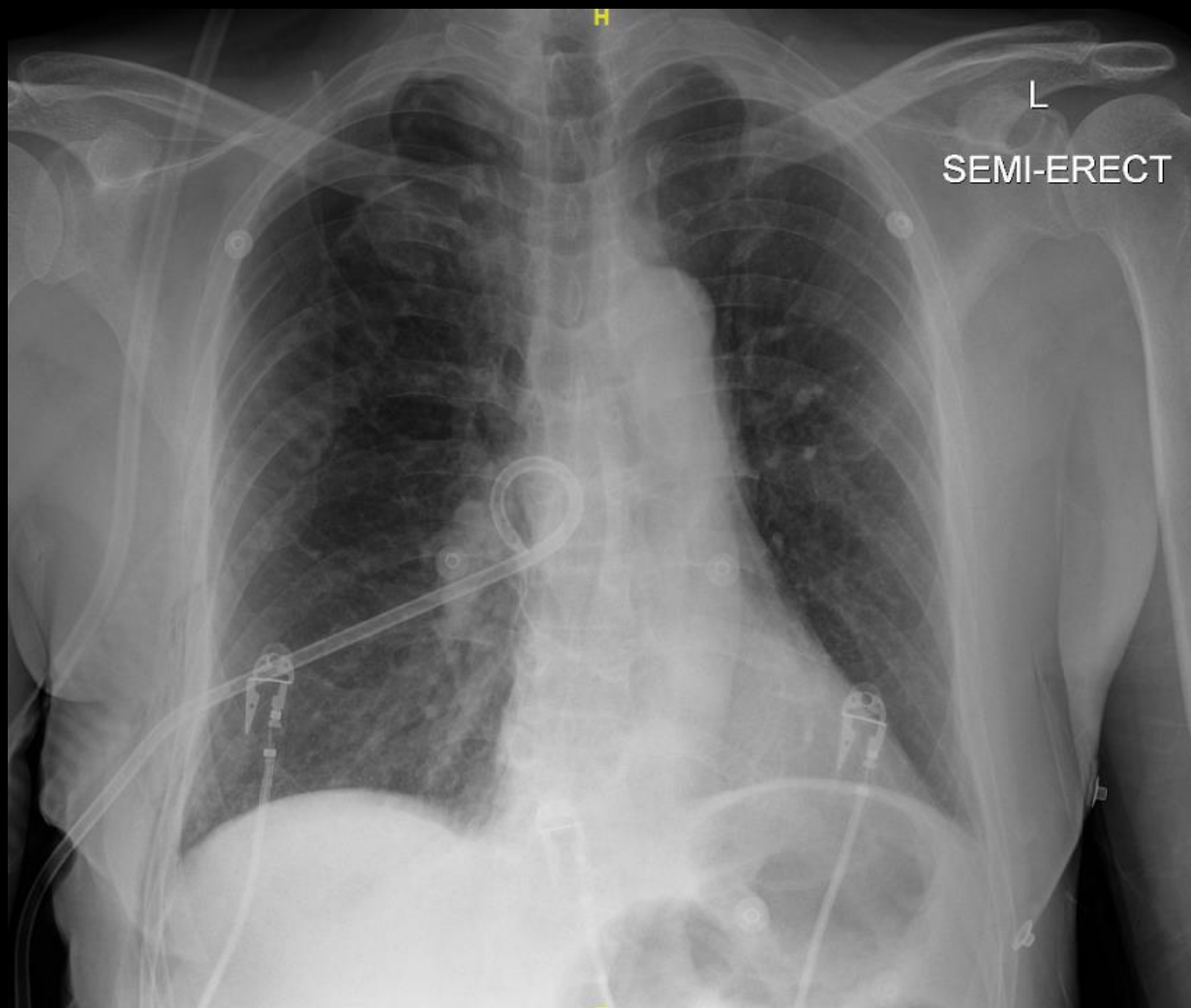
Leftward tracheal deviation with mediastinal shift (blue arrows)

Final Dx: Large right tension pneumothorax

X vs Y	Definition	
Small vs Large	<u>British Thoracic Society Guidelines</u> Small: <2 cm Large: ≥2 cm <i>measured from chest wall to lung edge at the level of the hilum</i>	<u>American College of Chest Physicians Guidelines</u> Small: <3 cm Large: ≥3 cm <i>measured from thoracic cupola to lung apex</i>
Simple vs Tension	Simple: no mediastinal shift Tension: +mediastinal shift +/- hemodynamic collapse	
Primary spontaneous vs Secondary spontaneous vs Iatrogenic/Traumatic	Primary spontaneous: No known underlying lung disease Secondary spontaneous: +known lung disease Iatrogenic/Traumatic: central line-induced, blunt trauma, etc	

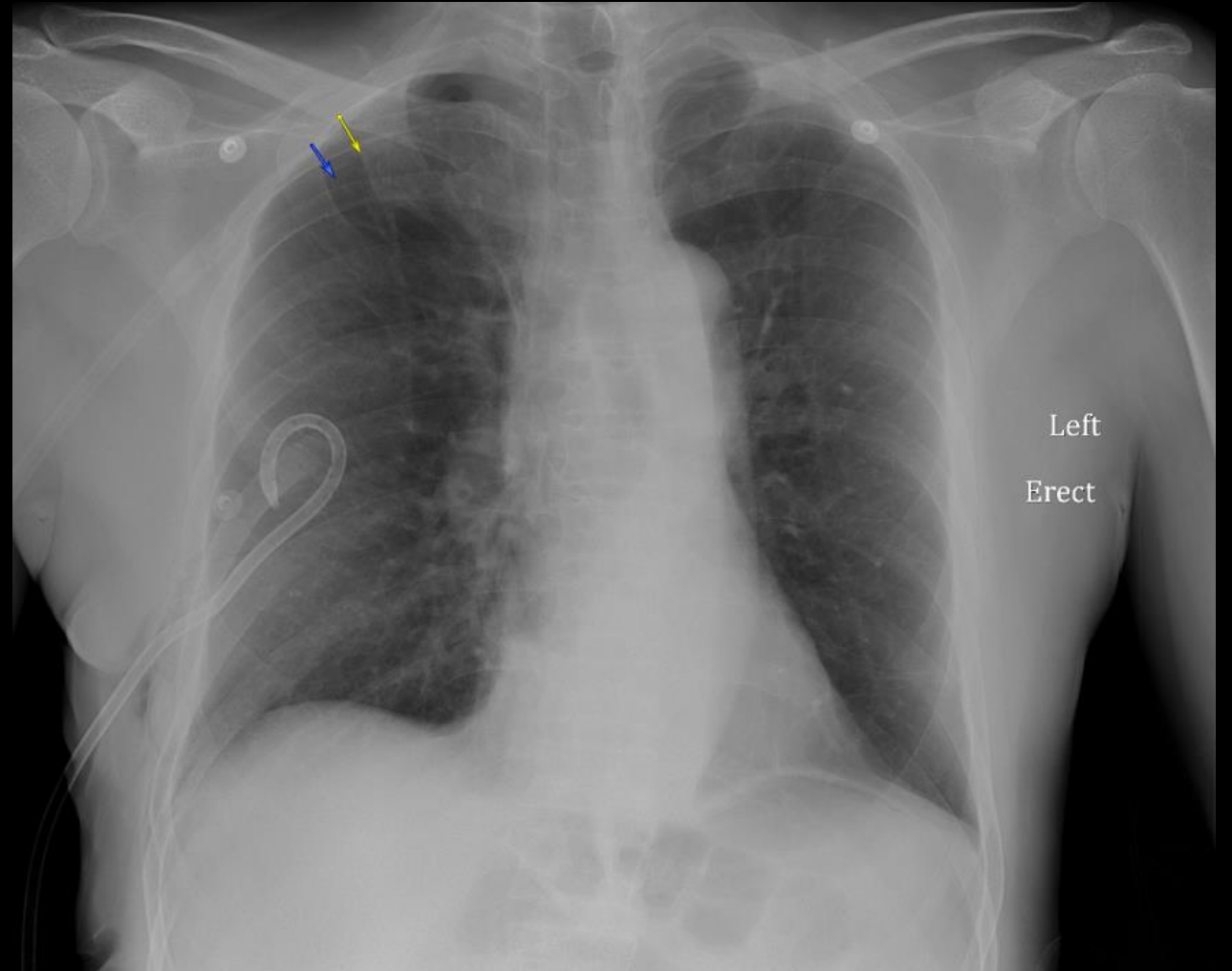
Intervention

- Initially, treated as acute asthma exacerbation with solumedrol, duonebs, and BIPAP.
- After portable CXR revealed PTX, decision to place 12 Fr. chest tube was made.



Intervention

- Chest tube pulled back 3cm
- Small residual right apical pneumothorax



Patient Disposition

- SOB and resp distress improved
- Chest tube to wall suction
- BiPAP discontinued
- SpO2 improved to 99-100% on NRB
- Admit to medicine
- Consult pulmonology
 - Secondary PTX - cause likely ruptured bleb

Case Discussion

- Did nebs and BiPAP make the PTX worse?
 - PTX is known to be a complication of BiPAP
 - It may have
- Do wheezes often occur in PTX?
 - Commonly: decreased or absent breath sounds
 - Wheezes can occur however, especially with secondary PTX and h/o underlying lung disease like COPD or asthma
- Why did they not needle decompression given suspected tension PTX?
 - No hemodynamic compromise
- Large bore chest tube vs pigtail?
 - Small bore pigtails are being used increasingly more often
 - Limited data, but some literature to suggest pigtail not inferior to large bore and less painful
- How often are PTX missed on CXR?
 - 30% missed on SUPINE chest films

References:

- <https://acsearch.acr.org/list>
- <https://acsearch.acr.org/docs/69451/Narrative/>
- <https://bestpractice-bmj-com.ezproxy.rowan.edu/topics/en-us/504/treatment-algorithm#patientGroup-0-0>
- <https://radiopaedia.org/articles/pneumothorax?lang=us>
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