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September 2022 Pulmonary Case of the Month: A Sanguinary Case

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History of Present Illness

A 55 years-old woman presented to pulmonary clinic with shortness of breath and chest pain for 4-6 weeks. No specific timing for her symptoms or triggers. The symptoms occurring occasionally at random times. Her dyspnea was not limiting her daily activities, though she has been asking her partners to help with chores more than before. Her chest pain was sharp localized to left posterior chest wall that seldom get worse with taking a deep breath. At worst it's mild. She also experienced dry cough that is occasional and not bothersome.

Past Medical History (PMH), Social History (SH), Family History (FH)

PMH

- Paraplegia secondary to gunshot wound to T11-12 in 2003; wheelchair-bound
- COVID 2021, incidentally diagnosed with no pulmonary symptoms
- Carpal tunnel syndrome, bilateral
- Acne
- GERD
- Splenectomy 2003 after uncontrolled bleeding from

splenic laceration following gunshot wound

- Tubal ligation 2005

SH

- Former tobacco use, 15 pack-years, quit 2007
- Drinks alcohol twice weekly
- No illicit drug use

FH

- Markedly positive for cancer in parents, siblings, aunt and uncles

Medications

- Baclofen 15mg TID
- Gabapentin 600mg QID
- Ketoconazole 2% cream every other day
- Omeprazole 40mg QD

Physical examination

- Heart rate 78, respiratory rate 14, SpO2 97% on room air, blood pressure 130/82, weight 70 kg, BMI 23.5
- Respiratory: Clear breath sounds bilaterally. No crackles or wheezing. No clubbing
- Cardiovascular: normal S1, S2; no murmurs

- Abdominal: Soft, nontender. Normoactive bowel sounds
- Extremities: No edema, warm.
- Skin: No rashes.
- Neuro: Mood appropriate. Alert and oriented x 3. Paraplegia, wheelchair-bound.

Which of the following ***should be done next?***

1. Pulmonary function testing
2. CBC
3. Chest x-ray
4. 1 and 3
5. All of the above

Correct!

5. All of the above

Chest X-ray, pulse oximetry, electrocardiography (EKG), pulmonary function testing, and a complete blood count (CBC) are all suggested as initial testing for dyspnea (1). Our patient's initial laboratory testing is given in Table 1.

Table 1. Initial Laboratory Testing.

- CBC, CMP, TSH and troponins are within normal limits
- Coccidiomycosis serology: negative
- SARS-COV2 PCR: negative
- EKG: normal

Her pulmonary function tests (PFTs) are given in Figure 1.

	PREDICTED		CONTROL		POST-DILATOR**	
	Pred	LLN	Actual	%Pred	Actual	%Chng
-- LUNG VOLUMES --						
TLC (N2) (L)	5.72	4.57	4.68	81		
SVC (L)	3.80	3.18	*3.17	*83		
RV (N2) (L)	2.04	1.63	*1.51	*74		
RV/TLC (N2) (%)	37.23	29.78	32.26	86		
FRC (N2) (L)	3.21	2.56	2.64	82		
-- SPIROMETRY --						
FVC (L)	3.80	3.18	*3.10	*81	*3.16	+2
FEV1 (L)	3.00	2.50	*2.23	*74	*2.33	+3
FEV1/FVC (%)	79.40	66.30	72.55	91	73.82	+1
PEF 25-75% (L/sec)	2.72	1.50	1.59	58	1.82	+14
PEF Max (L/sec)	7.17	5.38	*4.99	*69	5.48	+9
MVV (L/min)	105	88	107	101		
-- DIFFUSION --						
DLCO _{static} (ml/min/mmHg)	23.81	19.04	21.83	91		
DLCO _{correct} (ml/min/mmHg)	23.81	19.04				
VA (L)	5.72	4.77	4.91	85		
-- OXIMETRY --						
SaO ₂ (%)	Rest		Exercise			
	98	92				
Pulse						

Figure 1. Patient's pulmonary function testing. [Click here to view Figure 1 in a separate enlarged window.](#)

Which of the following is the ***best interpretation of the PFTs?***

1. Normal
2. Mild obstruction with reversibility by bronchodilators
3. Mild restriction
4. Mild obstruction and restriction
5. Moderate restriction

Correct!

3. Mild obstruction and restriction

The interpretation of the PFTs is not straightforward (2). The forced vital capacity (FVC) is normal but the forced expiratory volume in 1 second (FEV1) is slightly reduced. The FEV1 increases only 3% after a bronchodilator with a $\geq 12\%$ considered significant reversibility. The total lung capacity if barely normal but the residual volume (RV) is reduced consistent with a mild restriction. The PFTs were interpreted as consistent with mild obstruction and restriction.

The initial chest x-ray is shown in Figure 2.



Figure 2. Patient's initial chest x-ray. [Click here to view Figure 2 in a separate enlarged window.](#)

What is the ***best interpretation*** of the patient's initial chest x-ray?

1. Normal
2. Pulmonary mass in right lung
3. Pleural mass
4. Hyperinflation
5. Elevated right diaphragm

Correct!

3. Pleural mass

There is a pleural mass seen best on the lateral image (Figure 3).



Figure 3. Lateral chest x-ray from Figure 2 with the mass circled in red. [Click here to view Figure 3 in a separate enlarged window.](#)

What should be *done next*?

1. Closed pleural biopsy
2. CT guided biopsy
3. Pleuroscopy with pleural biopsy
4. SPECT scan
5. Thoracic CT scan

Correct!

5. Thoracic CT scan

A thoracic CT scan to better define the lesion is indicated. Representative images from the patient's thoracic CT scan are shown in Figure 4.

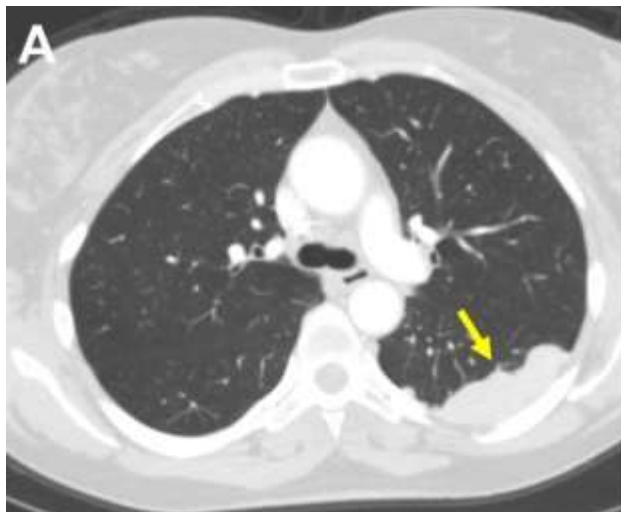


Figure 4. Representative images from patient's thoracic CT scan showing a left pleural mass (yellow arrows). [Click here to view Figure 4 in a separate enlarged window.](#)

What should be *done next*?

1. Closed pleural biopsy
2. CT guided biopsy
3. Pleuroscopy with pleural biopsy
4. SPECT/CT scan (single photon emission computed tomography/computed tomography) with 99 m technetium-labelled sulphur
5. Surgical resection of the pleural mass

Correct!

4. SPECT/CT scan (single photon emission computed tomography/computed tomography) with 99 m technetium-labelled sulphur

The homogenous nature of the mass, along with a history of splenectomy following severe trauma to the abdomen, raises suspicion for a rare pleural pathology, intrathoracic splenosis or pleural splenosis (3,4). Although PET scan is useful investigating pleural malignancies, technetium 99 scintigraphic studies- with demonstration of ectopic intrathoracic sulfur colloid uptake- are gold standard for diagnosis of pleural splenosis. Such uptake would indicate hematopoiesis. Our patient's SPECT/CT is shown in Figure 5.

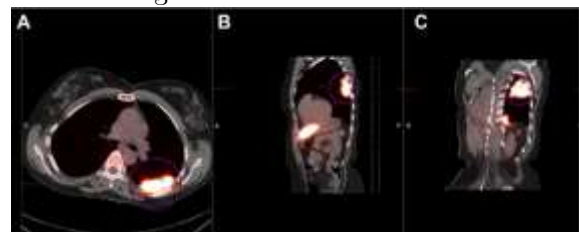


Figure 5. Patient's SPECT/CT scan (single photon emission computed tomography/computed tomography) with 99 m technetium-labelled sulphur. [Click here to view Figure 5 in a separate enlarged window.](#)

What is the *best next step*?

1. Interval CT scan follow up every 6 months
2. Interval NM SPECT follow up every 6 months

3. Pleural biopsy to confirm the diagnosis
4. Reassurance and clinical follow up
5. Surgical resection of pleural masses

Correct!

4. Reassurance and clinical follow up

Studies in asymptomatic patients showed an incidence of up to 50% of splenosis in patients following traumatic splenectomy (5-7). Symptoms include chest pain and hemoptysis. There have been several case reports of incidental discovery of splenosis upon resection (with varying degrees of symptoms' resolution); more and more studies are noting that a careful history of trauma or splenectomy along radiological features may reduce the need for invasive testing and surgery. Severe pain has been reported to improve with resection.

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