

Pleural Effusions

Medicine Night Float Quick Clinical Teaching Cases

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Clinical Scenario:

40 yo female presents to the ED with pleuritic chest pain and SOB that began acutely 5 days ago and now have worsened. She has intermittent low-grade fever. She denies cough, orthopnea, or weight loss. She is on oral contraceptives. She denies h/o tobacco use. CXR shows a large left-sided pleural effusion.

What might you hear on physical exam?:

Evidence for pleural effusion including dullness to percussion (100% sensitivity in large effusions³), absence of fremitus, and diminished breath sounds on the left

What are the most common causes of pleural effusion?:

TABLE 1. LEADING CAUSES OF PLEURAL EFFUSION IN THE UNITED STATES, ACCORDING TO ANALYSIS OF PATIENTS SUBJECTED TO THORACENTESIS. *

CAUSE	ANNUAL INCIDENCE	TRANSUDATE	EXUDATE
Congestive heart failure	500,000	Yes	No
Pneumonia	300,000	No	Yes
Cancer	200,000	No	Yes
Pulmonary embolus	150,000	Sometimes	Sometimes
Viral disease	100,000	No	Yes
Coronary-artery bypass surgery	60,000	No	Yes
Cirrhosis with ascites	50,000	Yes	No

From Light. NEJM 2002.²

How could you determine the cause of the effusion in this patient?:

1. Obtain further history regarding past history or risk factors for any of the above listed common causes of pleural effusions
2. Perform further physical exam -
 - a. Evidence for CHF - positive abdominojugular test (positive LR 8.0), S3 gallop (positive LR 5.7), elevated jugular venous pressure (positive LR 3.9), crackles and LE edema are neither sensitive nor specific³
 - b. Evidence for malignancy - lymphadenopathy, abnormal breast exam
 - c. Evidence for DVT - asymmetric calf swelling (calf asymmetry >2 cm is abnormal and associated with positive LR 2.1), asymmetric thigh swelling (positive LR 2.5), Homans' sign (neither sensitive nor specific for DVT)³
3. Laboratory - WBC, Chem7 for renal function, LFTs for hepatic function, D-dimer

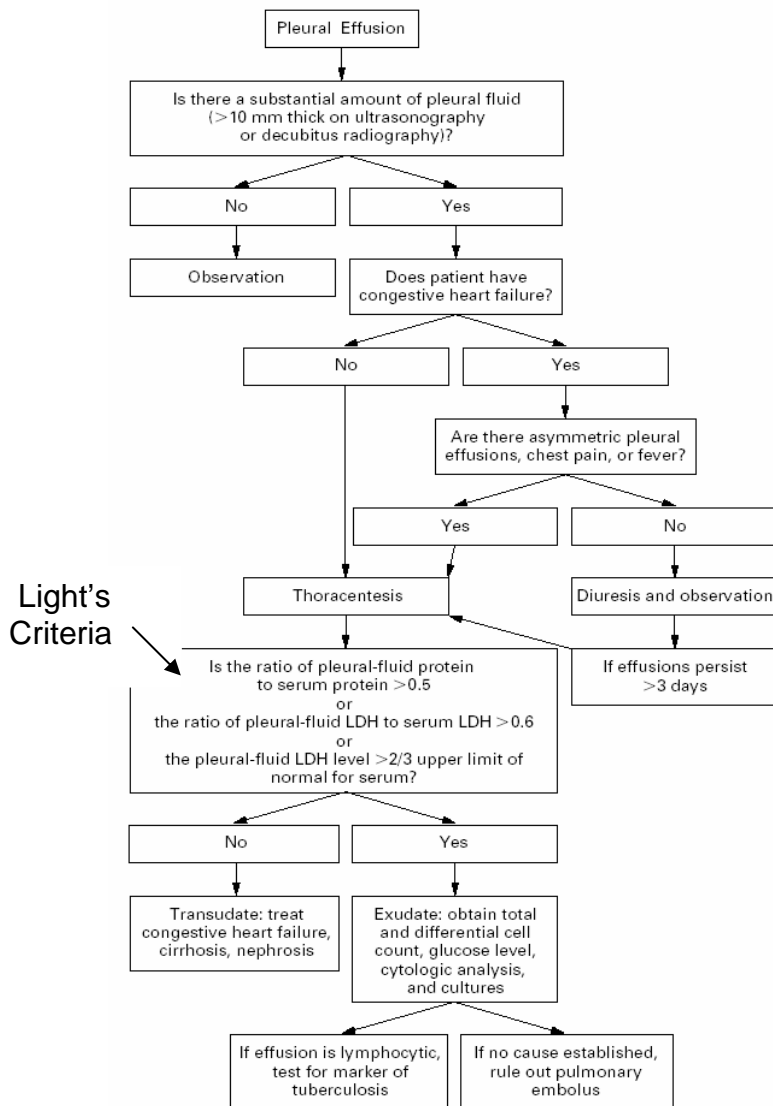
References:

1. Aleman C, Alegre J, Armandans L, et al. The value of chest roentgenography in the diagnosis of pneumothorax after thoracentesis. Am J Med. 1999; 107:340-3.
2. Light, RW. Pleural effusion. NEJM. 2002; 346:1971-7.
3. McGee, S. Evidence-based diagnosis. W.B. Saunders Company: Philadelphia. 2001.

Appendix:

Positive LR = positive likelihood ratio = sensitivity/1-specificity =
patients with disease who have the sign/patients without the disease who have the sign

When should you consider doing a thoracentesis?



Adapted from Light. NEJM. 2002.²

What tests should you send on the pleural fluid?:

Send pleural LDH & protein and serum LDH & protein at a minimum to help determine transudate vs. exudate.

If you anticipate that the fluid will be an exudate, also send:

a. gram stain and culture

b. cell count with differential

PMNs suggest an acute inflammatory process of the pleura caused by processes such as pneumonia, PE, or pancreatitis.

Lymphocytes suggest malignancy, tuberculosis, or post-CABG surgery.

c. glucose

Glucose <60mg/dL most commonly suggests parapneumonic or malignant effusion.

d. pH

A pH <7.20 indicates need for drainage in parapneumonic effusions and suggests a short life expectancy (<30 days) for person with malignancy.

If the fluid is grossly cloudy, send a triglyceride level. A level >110 mg/dL is consistent with a chylothorax.

In a patient with a symptomatic pleural effusion, how much fluid can I take off at one time?:

Few persons develop re-expansion pulmonary edema if 1.5L or less is removed².

Is a routine post-thoracentesis upright CXR necessary to assess for

pneumothorax?: At least one study¹ suggests that CXR post-procedure is not necessary unless air is obtained during thoracentesis; coughing, chest pain, or dyspnea develops; or tactile fremitus is lost over the superior aspect of the hemithorax on the involved side.

Clinical Scenario (continued):

Clinical suspicion was highest for PE given sudden onset of symptoms and use of oral contraceptives. CT angiogram confirmed PE on the left. Thoracentesis, performed because of fever, showed pleural LDH 416 units/L (ratio with serum LDH 3.1), pleural protein 3.0 mg/dL (ratio with serum protein 0.57). Fluid was exudate by Light's criteria. Cell count was 6200 WBC/microL with 67% PMNs consistent with inflammation. Culture and gram stain were negative. Patient's oral contraceptives were d/c'ed and she was treated with anticoagulation for her PE.

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