

Location: Office

Vital signs: BP: 120/70mmHg, HR: 90/min, regular: Temp: 37.8C(100F), RR: 18/min, Weight: 120 lbs: Height: 5'5"

CC: Fever, cough and right-sided chest pain for three months.

HPI: A 30-year-old, previously healthy white female presents to the office because of fever, dry cough and pain in the right lower chest. The pain is gradual in onset, 4-5/10 in intensity, sharp in nature, non-radiating, and increases with deep breathing. Her other symptoms include mild exertional dyspnea, irritability, decreased appetite and fatigue. She has unintentional weight loss of about 10 lbs over a period of two months. She denies any allergies, recent travel or sick contacts. She is not on any medication. She says that her mother has some joint disease. She denies smoking but occasionally drinks alcohol. Her menstrual cycles are always regular and last menstrual period was two weeks ago. She is sexually active with her boyfriend and uses OCPs for contraception. Her immunizations are up to date.

How do you approach this case?

Since the patient is stable based on the vital signs, order the following physical examination:

General

HEENT and Neck

Lungs

Heart

Abdomen

Extremities

CNS

Skin

The following are the examination findings:

The patient is anxious and sitting comfortably on the table. An erythematous rash is present over the face, more in the malar region. Decreased breath sounds and tactile fremitus, along with dullness to percussion are noted over the right lower lobe. No rhonchi or wheezing is noted. The rest of the exam is normal.

What is your clinical impression?

A 30-year-old, previously healthy, white female with symptoms of pleurisy found to have findings suggestive of pleural effusion and a malar rash. She also has a family history of some joint disease. All these findings should make you think about SLE as the number one diagnosis in this patient.

**Since the patient needs to be evaluated with pleural fluid analysis, shift her to ward by clicking on change location to ward.*

Orders:

Pulse oximetry, stat

CBC with diff, routine

BMP, routine

Chest X-ray PA, lateral views, routine

EKG 12 lead, routine

Serum ANA, routine

Urinalysis, routine

ESR, routine

Activity: Ambulation at will

Diet: Regular diet

Vitals: Vital signs every 4 hours.

**Call me when results are available*

Results of your tests:

Oxygen saturation is 94% on room air.

Labs:

Hb	10 g/dL
MCV	86 fl
WBC	10,000/cmm (Neutrophils: 62% Lymphocytes: 29%, Eosinophils: 3%, Monocytes: 6%, Basophiles: 0%)
Platelets	140,000/cmm
Blood glucose	118 mg/dL
Serum Na	135 mEq/L
Serum K	3.8 mEq/L
Chloride	110 mEq/L
Bicarbonate	18 mEq/L
BUN	16 mg/dL
Serum creatinine	1.0 mg/dL
Urine analysis	WNL (no hematuria, casts, protein, or infection)
Serum ANA	Positive at 1:320
Chest X-ray	Right-sided pleural effusion is seen.
EKG 12-lead	Normal sinus rhythm; normal EKG.

Review of orders:

Chest-x ray, decubitus films
PT/INR, routine
PTT, routine
Anti-Ds DNA, routine
Complement C3, serum, routine
Complement C4, serum, routine

**Call me when results are available*

Results:

Decubitus films show free flowing effusion without any loculation; there is a 1.5 cm layering.
PT/INR/PTT - Normal
Anti-Ds DNA is pending

Review of orders:

Thoracentesis, diagnostic
Informed consent
Pleural fluid analysis (Gram stain, AFB, C&S, Protein, glucose, LDH, cell count, cytology, pH)
Serum LDH, routine
Serum protein, routine
Perform physical exam after the thoracentesis.

Results:

Serum C3 and C4 are low
Anti-Ds DNA is positive.
Serum LDH: 90U/L
Serum protein:

Total protein 7 g/dL

Albumin 4.5 g/dL

Globulin 2.5 g/dL

Pleural fluid analysis:

Appearance	Slightly turbid
PH	7.6
LDH	240 U/L
Protein	10.5 g/dL
Glucose	46 mg/dL
Gram stain	Negative for organisms

(Calculate the ratios: PF LDH/Serum LDH-2.7, PF protein/Serum protein-1.5, which are characteristic of an exudate)

Orders review:

Rheumatology consult, stat (Reason: 30-year-old female with confirmed SLE. Please evaluate and treat)

Orders review:

Patient counseling
Prednisone, oral, continuous
Safe sex
Contraception counseling (avoid OCPs)
Regular exercise
No smoking
No alcohol
No illicit drugs
Medication compliance
Low fat, high fiber diet
Discharge to home

*Review after two weeks

Discussion:

The best clue for the presence of pleural effusion on chest-x ray is the blunting of the posterior costophrenic angle on lateral chest-x ray. So, if you see that finding on the chest-x ray, bilateral decubitus chest radiographs should be obtained to ascertain whether free pleural fluid is present. If the free fluid is present, layering will be seen. If the distance between the inside of the thoracic cavity and the outside of the lung is less than 1 cm, the pleural effusion is not clinically significant and it would be difficult to tap (risk outweighs benefits). If the distance is greater than 1 cm, a sample can be obtained for the diagnosis.

A diagnostic thoracentesis should be performed on nearly every patient with free pleural fluid that measures more than 1 cm on the decubitus films. However, in a patient with obvious congestive heart failure, the procedure can be withheld until the heart failure is treated. Before you tap, make sure the patient does not have coagulation abnormalities. The absolute contraindications for thoracocentesis include:

1. PT or PTT > twice normal
2. Platelet count < 25,000/cmm
3. Serum creatinine > 6 mg/dL

The pleural fluid can be an exudate or transudate. Exudative effusions result from increased capillary protein leak secondary to pleural and lung inflammation. Transudative effusions result from the imbalance between hydrostatic and oncotic pressures in the pleural space.

The important diagnostic criteria for separating pleural fluid into exudate or transudate are

measurement of serum and pleural fluid protein and LDH. At least one of the following three values should be present for an exudate. If none is present then it is almost always a transudate.

1. Pleural fluid protein/serum protein ratio > 0.5
2. Pleural fluid LDH/serum LDH ratio > 0.6
3. Pleural fluid LDH $> 2/3$ of the upper limit of normal serum LDH.

The determination of pH is important in parapneumonic effusions in which a value of less than 7.2 requires a chest tube aspiration to prevent empyema.

Pleural fluid ANA and rheumatoid factor can be obtained in undiagnosed/suspicious cases; but they are not routinely required in obvious cases. The elevated ANA titers in pleural fluid are neither specific nor sensitive for diagnosing lupus pleuritis. The diagnosis of lupus pleuritis is based primarily on the clinical picture and the serologic findings for lupus.

The most common clinically significant complication of thoracentesis is a pneumothorax. However, a routine chest-x ray after thoracentesis is not indicated. Careful physical examination is all that is required.

Common causes of transudative pleural effusions:

Congestive heart failure
Cirrhosis
Nephrotic syndrome
Peritoneal dialysis
Myxedema
Pulmonary emboli

Common causes of exudative pleural effusions:

Neoplastic diseases
Infectious diseases (pyogenic bacterial infections, tuberculosis, fungal infections, viral infections, parasitic infections)
Pulmonary embolism
Gastrointestinal disease such as esophageal perforation, pancreatic disease etc.
Collagen vascular diseases such as RA, SLE etc.
Recent surgery (postpericardiectomy or CABG)

*The effusions secondary to pulmonary embolism can be a transudate or an exudate.

Treatment:

The treatment of plural effusion requires the treatment of underlying cause. Large effusions may require therapeutic thoracentesis. Unlike rheumatoid pleuritis, the patients with lupus pleuritis very well respond to corticosteroids. The standard treatment includes oral prednisone 80 mg every other day, with rapid tapering once the symptoms are controlled. Many medications (hydralazine, procainamide, isoniazid, etc.) have been incriminated in producing drug-induced lupus erythematosus. If that is the case, the offending drug should be stopped.

Primary diagnosis:

Pleural effusion secondary to SLE