PLEURAL EFFUSION

ABDULLAH ALHARBI

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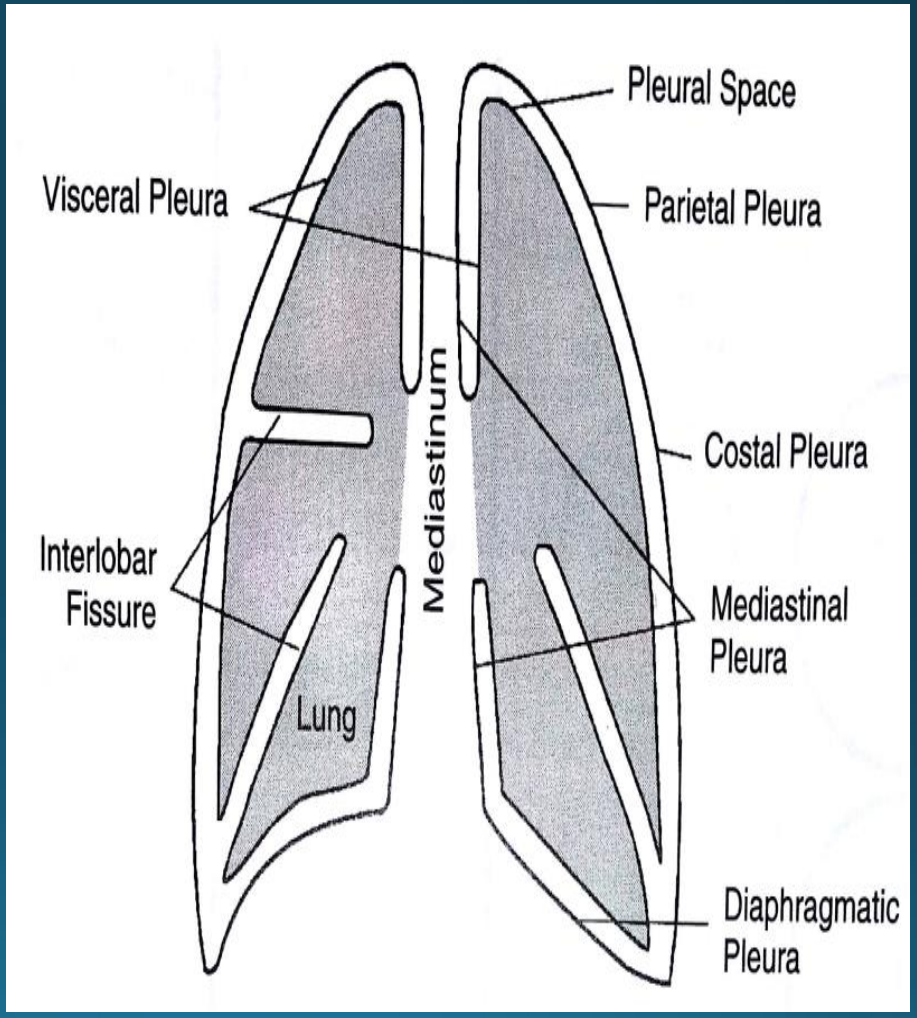
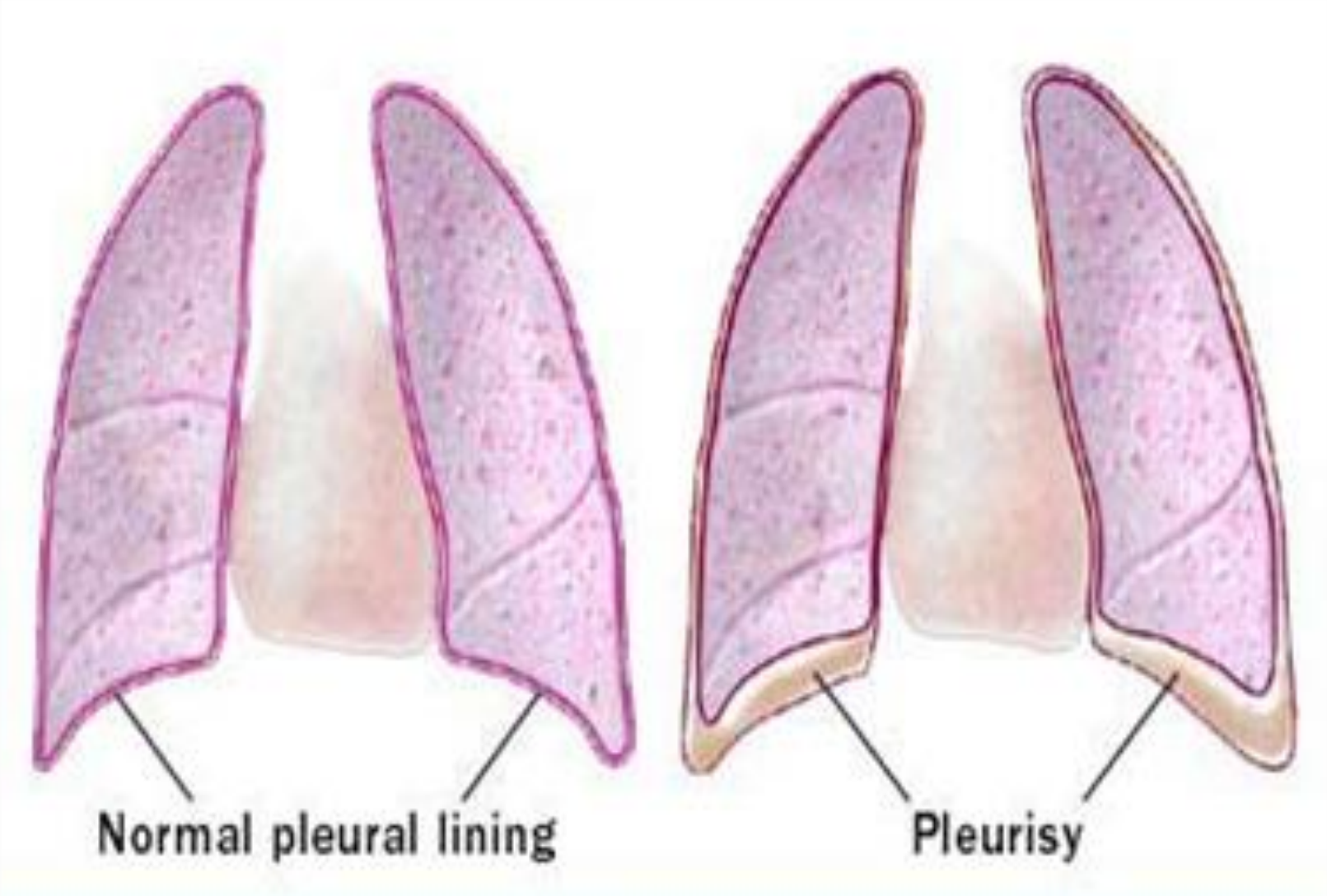
Introduction

- Excessive accumulation of pleural fluid.
- Imbalance between production and clearance.
- is not specific disease but is a reflection of underlying pathology.
- Pathology can be in lung, pleura or systemic.

Pleural anatomy

- Contains amount of pleural fluid ~17 to 34 ml




Normal pleural lining
Pleurisy

CLINICAL FEATURES

SYMPTOMS:

- Symptoms depend on the size of effusion and nature of underlying process.
- Inflammatory process present with pleuritic chest pain.
- When effusion is large pt present with dyspnea.
- Small or moderate size effusion with otherwise normal lung does not have dyspnea.
- When patient has an inflammatory nature or is infected fever is commonly present.

Systematics symptom's

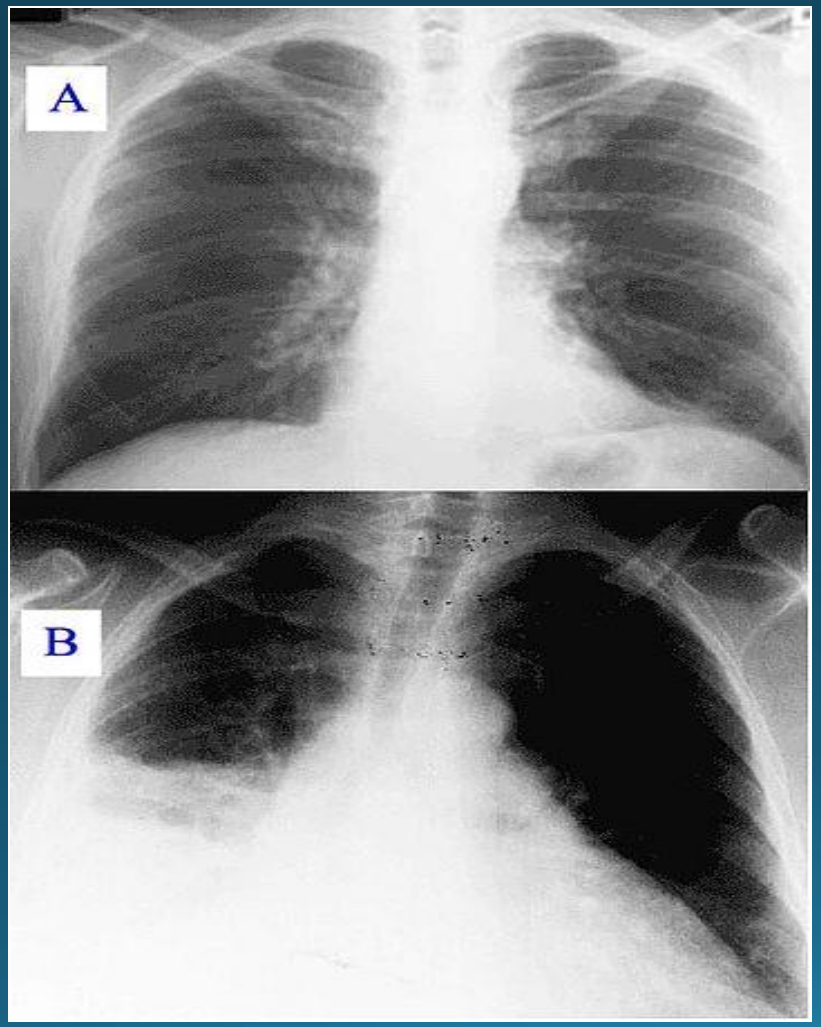
- cardiac, renal or liver
- wt. loss, and a h/o smoking (malignant pleural effusion)
- Trauma may result in hemothorax or chylothorax.
- Connective tissue disease
- Pleural TB
- Drugs

CLINICAL FEATURES

- Dullness to percussion.
- decreased tactile fremitus
  - Asymmetric chest expansion
  - Decreased breath sounds
  - Tracheal shift away from the affected side

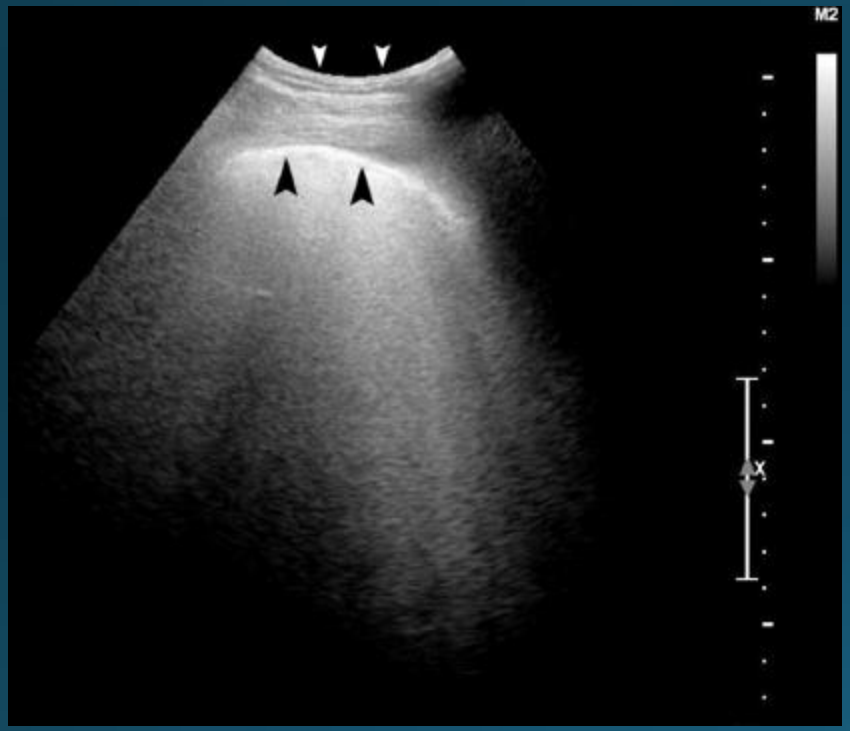
INVESTIGATIONS: Imaging Studies

- Chest X-ray



Thoracic ultrasound

- This helps in detecting even the small amount of fluid.
- US is helpful in cases of loculated PE for confirmation of the diagnosis and for making a site for aspiration.
- Helps in differentiating fluid filled and solid lesions.
- Also helps in detecting subpulmonic effusion from sub diaphragmatic collection.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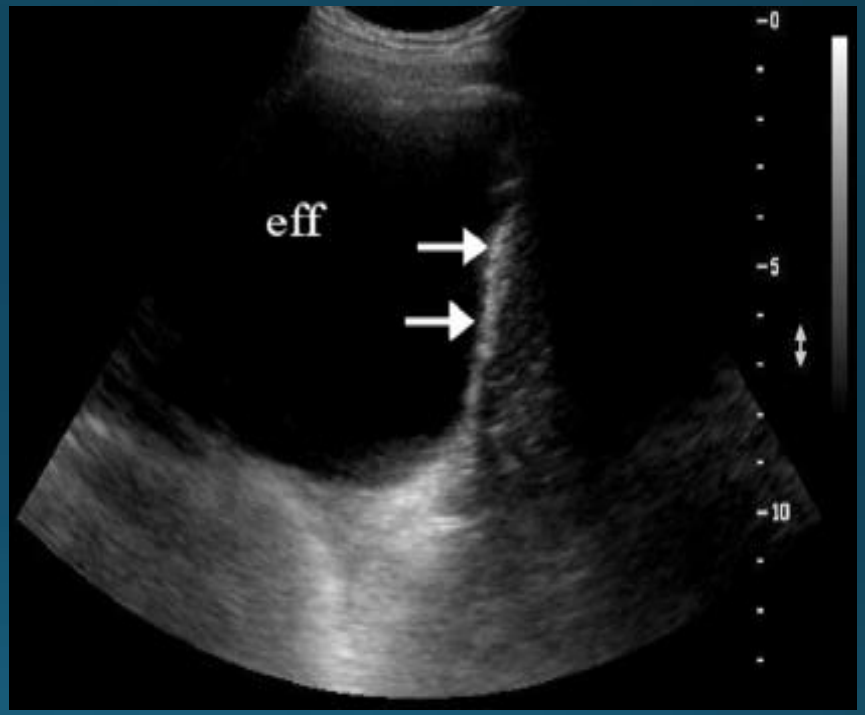
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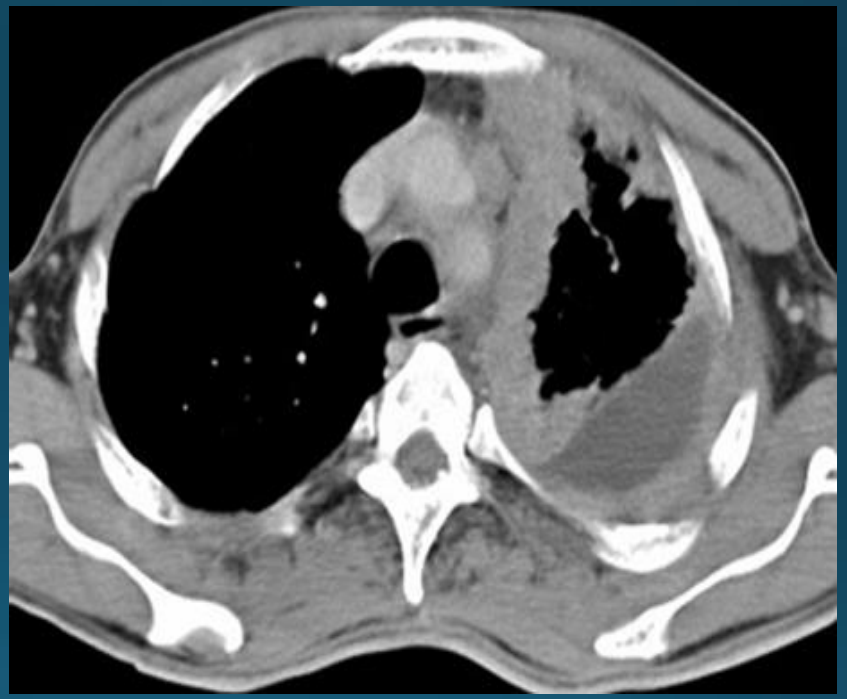
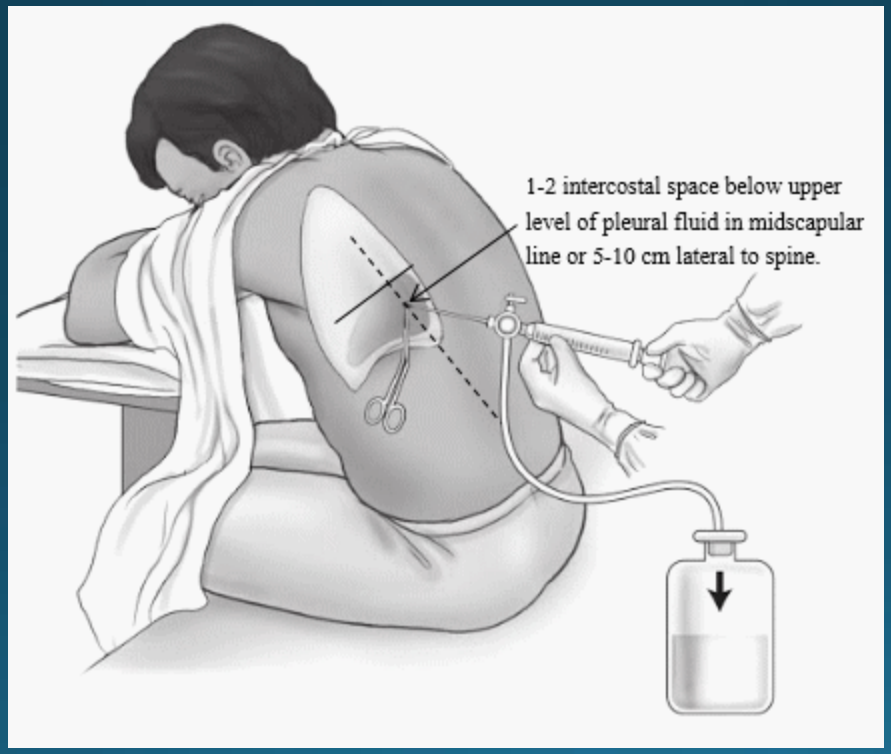
CT thorax

- Differentiates loculated empyema from lung abscess. And lung masses and other pathogy



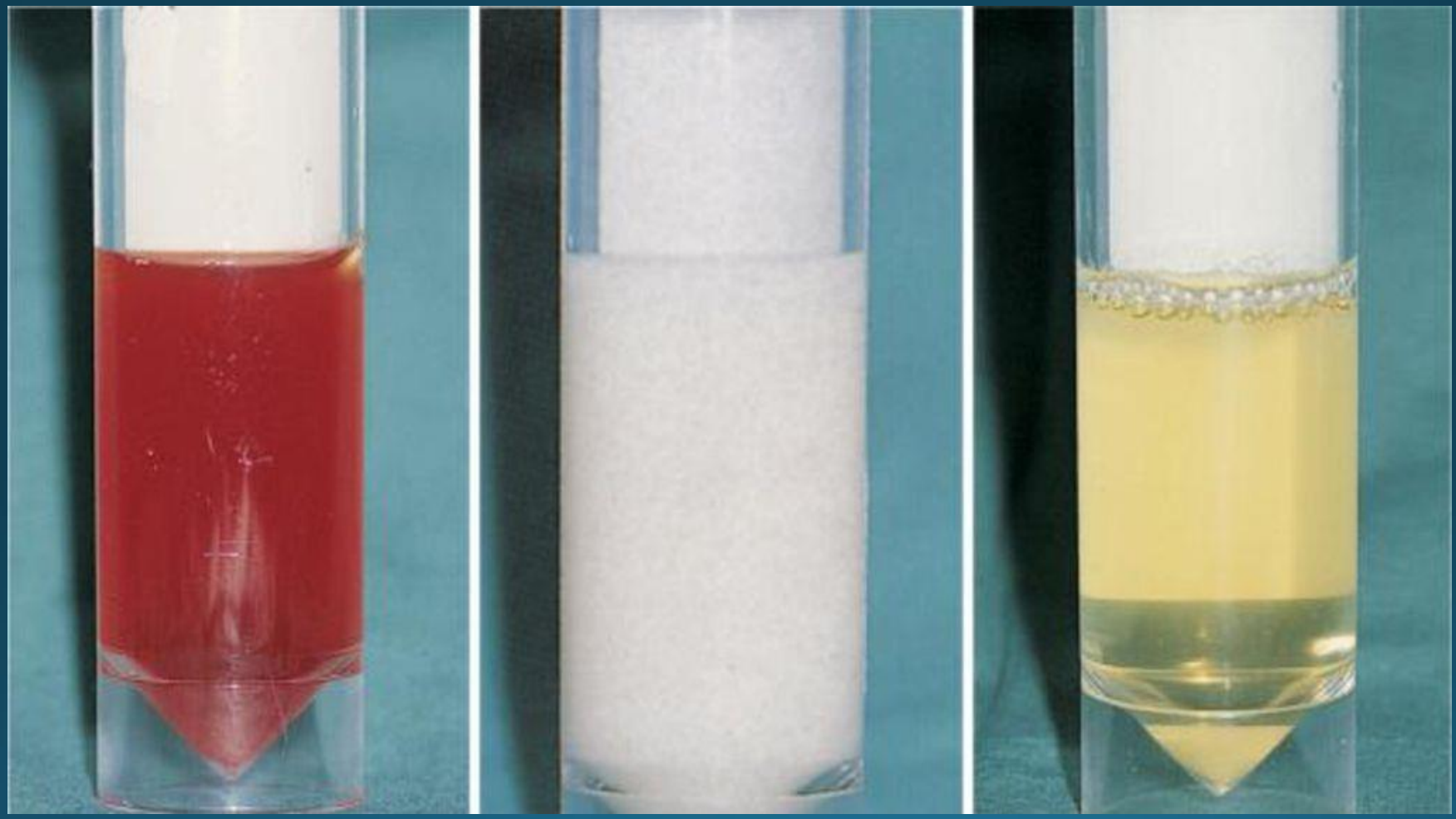
- Diagnosis

Thoracocentesis



Pleural Fluid Evaluation
5 Cs

- Color
- Cytology
- Culture
- Cell count
- Chemistry



Cell count

- Lymphocytic (> 50%)
  - CA (30-35%)
  - TB (15-20%)
  - Sarcoidosis
- PMNs
  - Empyema
  - Parapneumonic
  - Rheumatoid
  - Pulmonary infarction
- PMN or Lymphocytic
  - PE
  - Conn tissue disease
  - Post-cardiac injury
- Eosinophilic (> 10%)
  - Trauma
  - PTX
  - CA
  - Asbestos, parasites
  - Pneumonia
- RBC > 100,000/mm
  - CA
  - Trauma
  - Pulmonary infarction

Exudate Vs Transudate

- Light's criteria for exudative :
  - Pleural fluid protein divided by serum protein> 0.5
  - Pleural fluid LDH divided by serum LDH >0.6
  - Pleural fluid LDH more than 2/3rd the upper limit of normal serum LDH

Transudative vs Exudative

- Transudative
  - CHF
  - Nephrotic syndrome
  - Hypoalbuminemia
  - Hepatic hydrothorax
  - Atelectasis
  - Hypothyrodism
- Exudative
  - Pneumonia
  - Malignancy
  - PE
  - Inflammatory (pancreatitis, ARDS, uremic pleurisy etc
  - Connective tissue disease

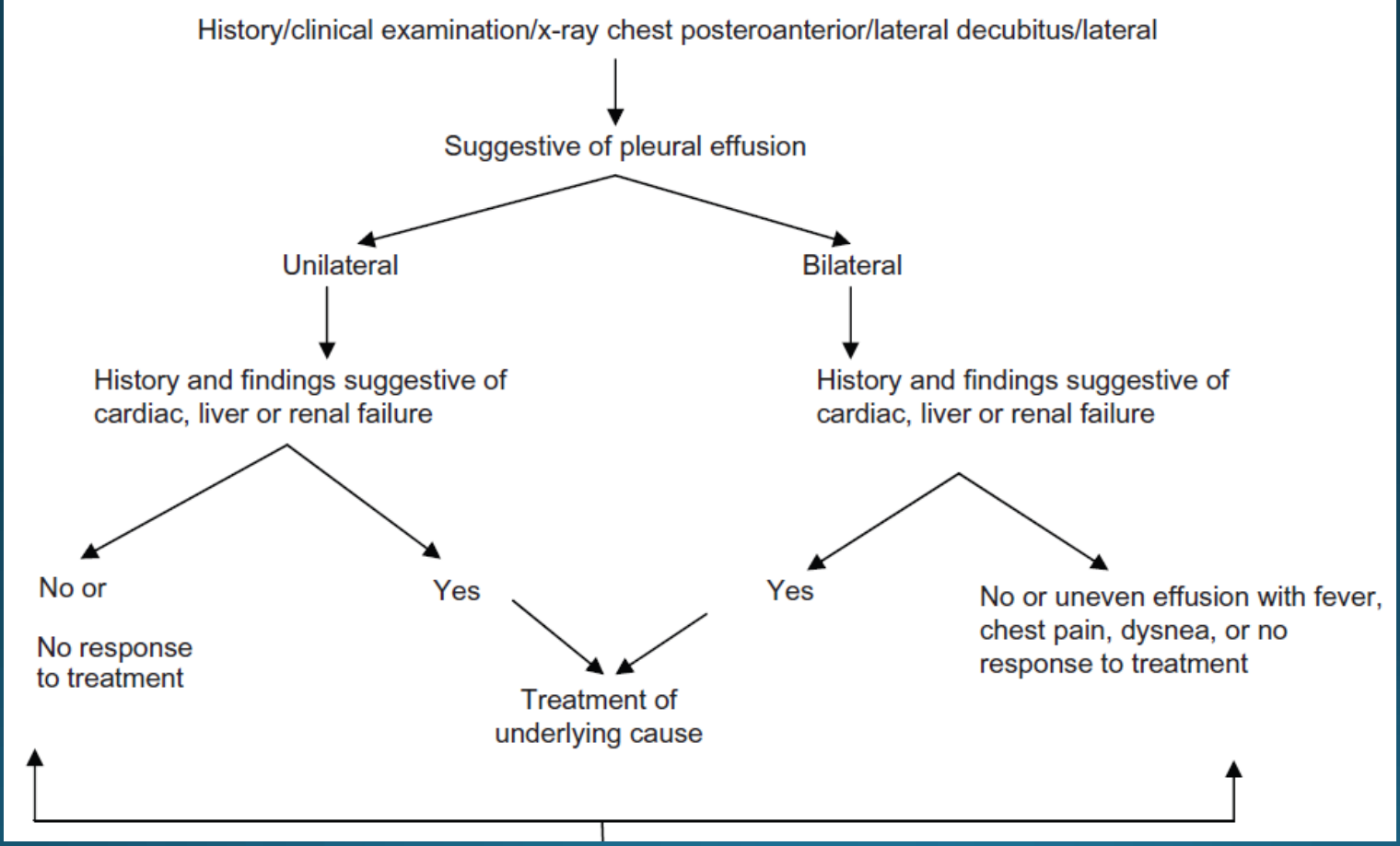
TREATMENT

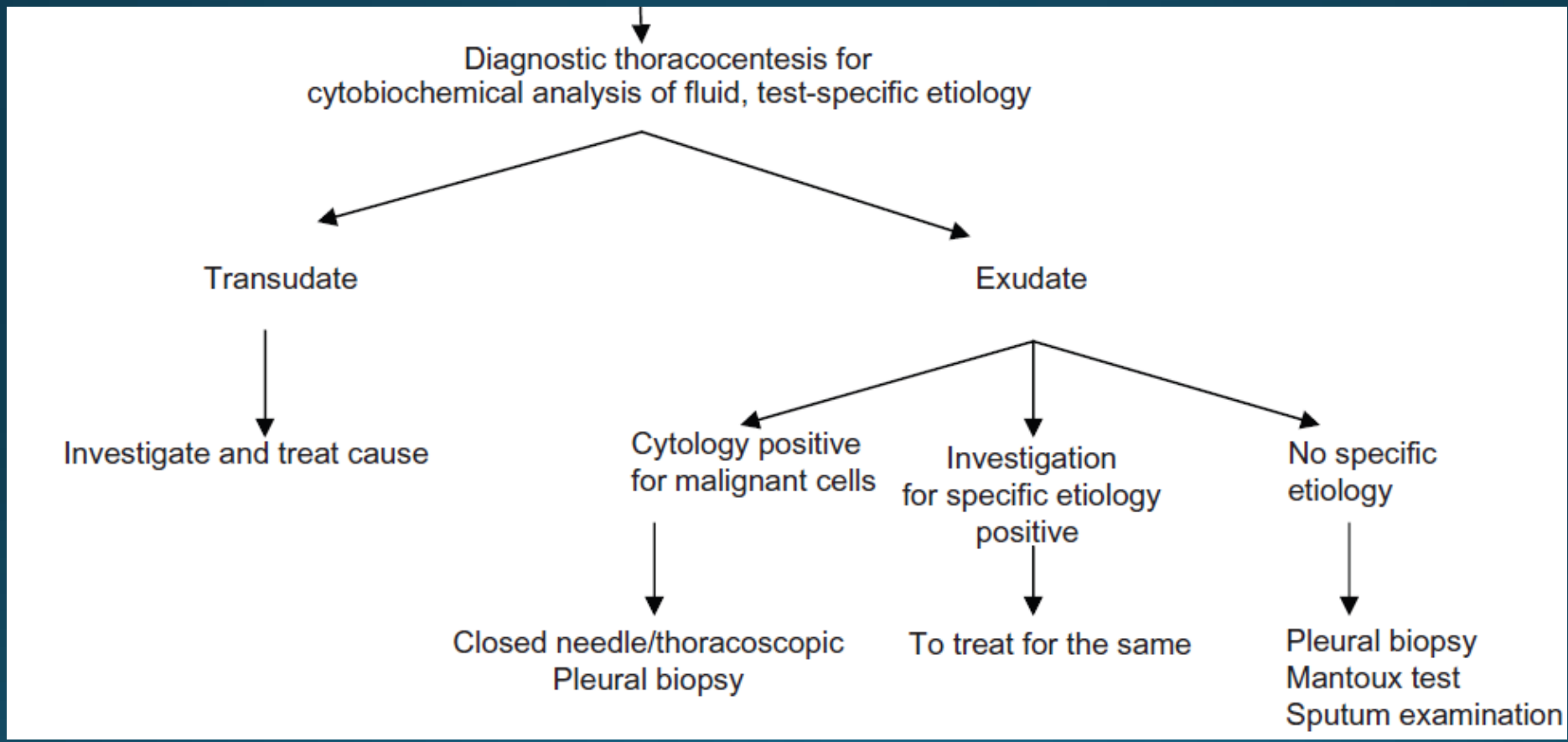
- Depend on the nature of underlying cause.
- Drainage of fluid, pleurodesis and surgical management are the therapeutic options for pleural effusion.

Characteristic	Uncomplicated parapneumonic effusion	Complicated parapneumonic effusion	Empyema
Appearance	Slightly turbid	Cloudy	Pus
Biochemistry values			
pH	>7.30	<7.20	NA
Glucose level, mg/dL	>60	<40	
Ratio of pleural fluid to serum glucose	>0.5	<0.5	NA
Lactate dehydrogenase level, U/L	<700	>1000	NA
Polymorphonuclear leukocyte count, cells/μL	<15,000	>25,000	NA
Microbiologic test result	Negative	May be positive	May be positive

NOTE. NA, not applicable.

Approach to a case




Diagnostic thoracocentesis for
cytobiochemical analysis of fluid, test-specific etiology
Transudate
Exudate
Investigate and treat cause
Cytology positive
for malignant cells
Investigation
for specific etiology
positive
No specific
etiology
Closed needle/thoracoscopic
Pleural biopsy
To treat for the same
Pleural biopsy
Mantoux test
Sputum examination

- A 42-year-old lady patient presented with a progressive dyspnea, chest pain, coughing. She had no fever. She was suffering from depressive syndrome for a long time. She was hospitalized about 3 months before for an episode of acute pancreatitis which resolved rapidly. The physical examination revealed that the patient was thin, tachypneic (20 breaths per minute), tachycardic, and there were features of a right-sided pleural effusion; the abdominal examination was unremarkable. There was no oedema.
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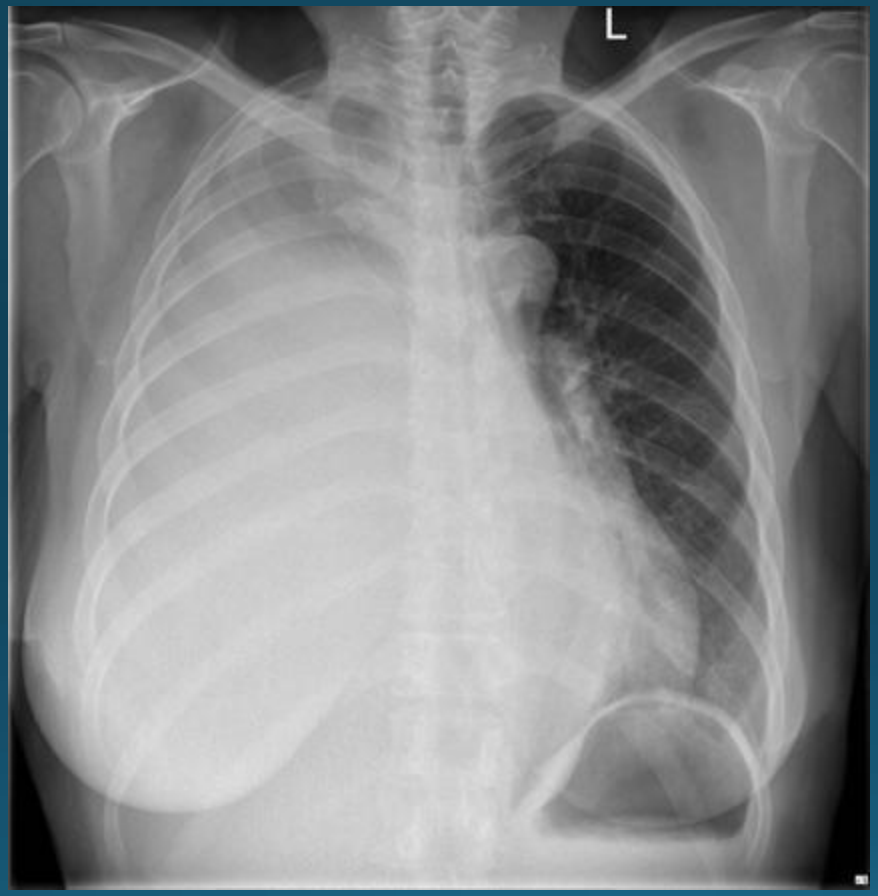
- Serum LDH 410
- Serum protein 4

- Pleural LDH 711
- Pleural protein 7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