Pleural effusion by Dr. Margaret Gleeson & Dr. Senan Glynn, Midland Regional Hospital, Mullingar

Irish Thoracic Society

Definition:

The accumulation of fluid in between the parietal and visceral pleura

- Exudative, fibropurluent and organizing phase

Exudative	Transudative
Infection – Parapneumonic, TB, empyema	Left ventricular failure
Malignancy – Secondary, Mesothelioma	Liver cirrhosis
Connective Tissue – RA, SLE	Nephrotic syndrome
Pancreatitis	Hypoalbuminaemia
Pulmonary embolism/infarction	Hypothyroid
Chylothorax/pseudo	Constrictive pericarditis
Yellow nail syndrome	Malignancy
Oesophageal rupture	Meigs syndrome
Dressler's syndrome	
Drugs – MTX, Nitrofurantoin, Amiodarone, Phenytoin	

Transudative effusion:

- If strongly suggestive treat underlying cause and observe
- Consider sampling only:
  - If atypical features 0r failure to respond
- Light's criteria misidentify transudative as exudative, especially if sampled after/on diuretic therapy

Malignant effusion:

Causes:

- Lung,, Breast, Lymphoma, Mesothelioma, GU, GI

Management:

- Depends on symptom burden, tumour type, patient choice, treatment response, lung re-expansion, Conservative management
- Recurrent thoracocentesis
  - Ideally in cases of short life expectancy
- Indwelling "PLEUREX" catheter
  - No better than talc for dyspnoea
  - Preferred in those with 'trapped lung'
- Pleurodesis
  - Slurry via intercostal drain
  - Poudrage with thoracoscopy

Investigations:

History and examination

Imaging:

- CXR
  - Homogenous opacity
  - Meniscal line
  - Does not respect the normal lung anatomical borders
  - 200ml detected on posterior-lateral film
  - 50ml detected on lateral film
- US Thorax
  - Detects the smallest volume of pleural fluid (5ml)
  - Simple: Anechoic
  - Complex: Septated, echogenic
- CT Thorax with contrast
  - Detect pleural enhancement, thickening or nodularity
- MRI Thorax

Pleural fluid sampling:

- pH, glucose
- LDH, protein
- Cytology
  - Cell count differential
  - Sensitivity for malignant diagnosis is 60%
- Microbiology
  - MC&S sensitivity 40%
    - Blood culture medium increase yield by 21%
  - Acid Fast Bacilli sensitivity 20%
  - Adenosine deaminase
    - High sensitivity in lymphocytic fluid
  - 40% will remain culture negative
- Amylase
- Cholesterol/Triglycerides
- Rheumatoid factor
- Haematocrit
  - >50% of serum HCT suggests active pleural bleeding
- Urea, albumin

Pleural biopsy

- VATS vs surgical

Light's criteria:

IF

Pleural Fluid: Serum PROTEIN >0.5

AND/OR

Pleural Fluid: Serum LDH >0.6

AND/OR

Pleural LDH >2/3 upper limit of normal for serum

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Exudative effusion

Empyema:

Community acquired	Hospital acquired:
• Strep milleri group • Strep pnemoniae • Staphyloococci • Anaerobes	• MRSA • Staphylococci • Enterobacteriaceae • Enterococcus

Indicators:

- Pus
- Positive culture
- Complicated with pH <7.2

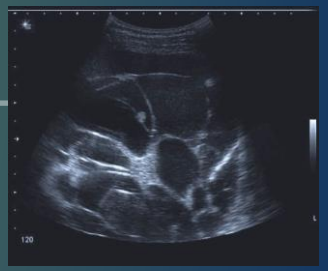
Treatment goals:

- DVT prophylaxis
- Nutrition
- Pleural space drainage
  - Consider early surgical referral
- Antibiotics
  - Guided by positive cultures and local sensitivities

Loculated effusion:

MIST 2 trial - tPA plus DNase

- Benefits:
  - Improved drainage and radiological response
  - Reduced hospital stay
  - Reduced rate of surgical conversion
- Protocol:
  - tPA (Alteplase) 10mg BD x 3/7
  - DNase 5mg BD x 3/7
- Complications:
  - Pain
  - Infection
  - Bleeding
  - Drug reaction



Chylothorax:

- Thoracic duct damage with chyle leakage
- Congenital, idiopathic, traumatic
- Fluid triglycerides >100mg/dl confirms diagnosis
- In undisturbed samples the supernatant is clear
- Management:
  - Dietary modification
  - Pleurodesis
  - Thoracic duct ligation