Medicine – Dr. Kosar – Lecture 3 – Plural Diseases

Plural Effusion

Is accumulation of serous fluid within plural space. Accumulation of frank pus called empyema and of blood called haemothorax.

Plural fluid accumulates as a result of either increase hydrostatic pressure or decrease osmotic pressure (Transudate effusion), as seen in cardiac, liver or renal failure, or from increase microvascular pressure due to disease of the plural surface itself or any injury in the adjacent lung tissues (Exudate effusion).

The causes of majority of plural effusion can be identified through a thorough history, examination and relevant investigations.

Causes of plural effusion

I- Transudative effusion

When the protein content of the plural fluid is < 3g/l or 30mg/dl, it involve either increase hydrostatic pressure or reduce osmotic pressure (due to hypoalbuminaemia).

1- Left ventricular failure LVF, usually causes bilateral effusion but could be unilateral.
2- cirrhotic liver disease or CLD, mostly Rt sided effusion and associated with ascites.
3- Pulmonary embolism PE, only 10-20% are tranudate.
4- Nephrotic syndrome and renal failure, usually it is bilateral,
5- Hypothyroidism, occur usually with peritoneal and pericardial effusion, but could be an isolated finding.
6- peritoneal dialysis
7- constrictive pericarditis
8- Meig’s syndrome is unilateral effusion (often Rt sided), with ascites in women with ovarian or peritoneal tumour.
9- Malignancy; only 5% of the cases are transudate.

II - Exudative effusion

When the protein content of the fluid is > 3g/l or 30mg/dl, it involves an increase in capillary permeability and impaired plural fluid re-absorption.

Causes are;

1- Para pneumonic effusions, occurs in 40% of all bacterial pneumonia, it is commonest exudative effusion in young adults.
2- Malignancy primary or secondary; common type of effusion in > 65 years of age, and it is usually unilateral.
3- Pulmonary embolism PE, in 80-90% are exudative effusion.
4- Tuberculosis TB, typically unilateral, large in amount and lymphocytic effusion.
5- Empyema; when plural fluid PH less than 7.2
6- Mesothelioma, is a tumour of the plural surface.
7- other infections, (Viral, Parasitic and rickettsial).
8- Post MI (Dressler’s Syndrome).
9- Post, By pass operation CABG (coronary artery by-pass graft), usually it is Lt sided.
10- Auto immune and rheumatological diseases (RA, SLE, Scleroderma, and Sarcoidosis).
11- Chylo thorax, when chylomicron present or plural fluid Triglyceride level > 110mg/dl
12- Drug induced, it's very rare can be caused by (Methotrexate, Bromocriptine, amiodarone, phenytoin, and nitrofurantoin)
13- Rare causes (Cryptogenic organising pneumonia COP, yellow nail syndrome).

**Common causes of plural effusion**
1- Par pneumonia effusion
2- Cardiac failure
3- TB
4- Pulmonary infarctions
5- Malignancy, primary and secondary
6- Sub diaphragmatic disorder (Sub phrenic abscess)

**Clinical assessment**
Symptoms of pleurisy often precedes the development of an effusion especially in patients with underline pneumonia, PE, connective tissue diseases, shortness of breath SOB is the only symptom related to the effusion and it’s severity depends on the size of the effusion. Clinical signs include, decrease chest expansion, shifting of trachea to the opposite site of the effusion, stony dull percussion note and decrease breath sound and vocal resonance on auscultation.

**Investigations of plural effusion**
1- Radiological investigations
   1- CXR, the classical appearance of the plural effusion on erect PA CXR, is of a curved shadow at the lung base with blunting of chosto-phrenic angle.

Around 200 mls of fluid required to be apparent on CXR.
2- Ultra sound examination of chest, is more accurate than CXR to detect small amount of plural fluid and providing additional information regarding USS guided aspiration.
3- CT scan of the chest, will provide more information regarding the causes of effusion, and some times weather it is benign or malignant effusion.