Analysis of pleural aspirates

Pleural effusion is categorised into transudate (< 30 gm/dL) or exudate (≥ 30 gm/dL) based on the protein content. Exudative effusions are caused by a variety of inflammatory disorders and often require more extensive evaluations than transudate.

Light’s criteria may also be used in the assessment of pleural effusions. Based on the criteria, a pleural effusion is likely exudative if at least one of the following exists:

1. The ratio of pleural fluid protein to serum protein is > 0.5
2. The ratio of pleural fluid LDH and serum LDH is > 0.6
3. Pleural fluid LDH is > 200 u/L
4. Pleural fluid LDH is > 0.6 or two-thirds times the normal upper limit for serum.

The causes of pleural effusions are varied; fluid (effusion), blood (haemothorax), pus (pyothorax) and chyle (chylothorax). Pleural effusion is by far the most common and the common aetiologies based on whether the fluid is a transudate or exudate is shown in the table below:

Common causes of exudative effusion include:
1. Infection that can be viral or bacterial, including tuberculosis
2. Bronchial carcinoma or pulmonary metastases
3. Pleural pathology such as mesothelioma
4. Autoimmune condition, such as rheumatoid arthritis, systemic lupus erythromatosus
5. Pulmonary infarction from pulmonary embolism

Common causes of transudative effusion include:
1. Congestive cardiac failure
2. Liver cirrhosis
3. Nephrotic syndrome
4. Hypothyroidism
5. Low nutritional status (hypoalbuminaemia)

Pleural space abnormalities: how they appear on a chest radiograph or chest X-rays in commonly encountered conditions?

Pneumothorax
There is a rim hyperlucency that is seen in the upper zone. The edge of the lung may be visible, usually more obvious in larger pneumothoraces. There is also be loss of lung or vascular markings. Large or tension pneumothorax will cause mediastinal shift.

Pleural effusion
There is hypolucency (fluid) seen in the lower zone due to effect of gravity, unless loculated. The fluid can be due to transudate or exudative fluid, blood, pus or chyle. There upper border will usually be a concave meniscus.

Hydropneumothorax/haemopneumothorax or pyopneumothorax
The findings consist of hypolucency in the lower zone (fluid) with hyperlucency in the upper zone (air) with a straight border.

REFERENCES