

# Pleural effusion

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Pleural effusion can be readily understood with reference to the physiological mechanisms governing the flux of pleural fluid given above. Pleural effusions are divided into exudates and transudates, depending on protein content (more [exudates] or less [transudates] than 30 g/L), and characterised further according to glucose content, pH and lactate dehydrogenase content. The following are the most common ways in which the pleural fluid balance is disturbed.

**Malignant pleural effusion** Pleural effusion is a common complication of cancer. This may be due to: lung cancer; pleural involvement with primary or secondary malignancy; mediastinal lymphatic involvement. Lung cancer There may be direct involvement of the parietal and/or visceral pleura, collapse of the lung parenchyma and spread to the mediastinal lymphatics, or a combination of these, causing pleural fluid accumulation. It is usually regarded as a feature that puts lung cancer beyond surgical cure.

**Pleural malignancy** The only primary malignancy of the pleura seen with any regularity is malignant mesothelioma. This is a consequence of asbestos exposure, with few exceptions. The peak of asbestos importation into the UK was from 1960 to 1975, with the incidence initially rising but more recently stabilising (2015–2017), with a fall in incidence projected in the future. Mesothelioma commonly presents with breathlessness because of pleural effusions, pain and systemic features of malignancy. Diffuse seeding of the parietal and visceral pleura is a common pattern any origin.

**Mediastinal lymphatic involvement** In many instances, particularly in breast cancer, there is no evident disease in the pleura. The disease is in the mediastinal lymphatics, which are obstructed, and this upsets the balance of physiological forces that control pleural fluid. Surgery for patients with malignant pleural effusion The surgeon has two roles: to make the diagnosis and to achieve effective palliation by draining the fluid and pleurodesis.

**Diagnosis** Pleural biopsy can be obtained by a range of techniques, with VATS being the most common. An unequivocally positive biopsy is useful, but a negative biopsy may be a sampling error.

**Summary box 60.3 Biopsy of the pleura**

**Pleural infection and empyema** Empyema is the end stage of pleural infection from any cause. It most commonly results from infection of the underlying lung, involving pneumonia or a lung abscess, but can occur as a complication of any thoracic operation. It is seen if a traumatic haemothorax becomes infected or in the course of management of pneumothorax or pleural effusions. It may be associated with pus under the diaphragm (Table 60.3 pathological diagnosis requires the presence of thick pus with a thick cortex of fibrin and coagulum over the lung. When empyema presents de novo it usually follows pneumonia, and three phases are described:

- 1 In the exudative phase, there is a protein-rich (>30 g/L) effusion. If this becomes infected with the organisms from the lung (typically *Streptococcus milleri* and *Haemophilus influenzae* in children), the scene is set for empyema. At this stage antibiotics may be all that is required. Aspiration or drainage to dryness in addition is preferred.
- 2 Over subsequent days, the fluid thickens to what is known as the fibrinopurulent phase. Drainage at this stage is prudent as antibiotics on their own are unlikely to be curative.
- 3 The organising phase causes the lung to be trapped by a thick peel or 'cortex' for which surgical

management may be required. Leon David Abrams , 1923–2012, cardiothoracic surgeon, the United Birmingham Hospitals, Birmingham, UK.

Cytological examination of the pleural /f\_l uid (low yield) Abrams' needle (low yield in malignancy) Computed tomography (CT)-guided needle biopsy of a suspicious area VATS biopsy Open surgical biopsy formation. Pulmonary infection Unresolved pneumonia, bronchiectasis, tuberculosis, fungal infections, lung abscess Aspiration of pleural effusion Any aetiology Trauma Penetrating injury, surgery, oesophageal perforation Extrapulmonary sources Subphrenic abscess Bone infections Osteomyelitis of ribs or vertebrae

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