

Appendix 1. Standardised Diagnostic criteria for pleural effusions (North Bristol Pleural Investigation Study (08/H0102/11)).**Malignant**

- a/. Malignant pleural fluid cytology or biopsy
 - or
- b/. Histologically confirmed pulmonary/extra-thoracic malignancy with radiographic evidence of metastasis to ipsilateral pleura on CT.
 - or
- c/. Radiological changes meeting Leung's criteria [1] which have progressed in keeping with malignancy on interval CT scan in the correct clinical context.
 - or
- d/. Autopsy confirming pleural malignancy

Empyema

- Clinical presentation suggestive of sepsis/infection
And (one or more of the following)
- a/. Pleural fluid gram stain or culture positive
 - Or
 - b/. Frank pus on pleural aspiration

Complicated parapneumonic effusion (CPE)

- Clinical presentation suggestive of sepsis/infection (and follow up for at least 6 months inconsistent with pleural malignancy)
And (one or more of the following)
- a/. Pleural fluid pH ≤ 7.2
 - or
 - b/. Pleural fluid glucose ≤ 3.4 mmol/L
 - or
 - b/. Pleural fluid LDH > 1000 IU/L

Simple Parapneumonic effusion (SPE)

- Clinical presentation suggestive of sepsis/infection with appropriate chest radiology and pleural fluid which does not fulfil the criteria for empyema or CPE (above)
And
Resolution of effusion on CXR after antibiotics or clinical progression to pleural infection (see above)

Connective tissue disease (including RA)

- Systemic features or known diagnosis of connective tissue disease
And
chest radiology (including CT imaging) showing benign features (eg doesn't meet any of Leung's criteria) with at least 6 months follow-up and /or pleural biopsy negative for malignancy.

Pulmonary embolism

Evidence of PE on CTPA

And

No alternative explanation for pleural effusion on cross sectional imaging or pleural fluid analysis. (NB the CT shows no evidence of pleural thickening – which would suggest another cause)

BAPE or diffuse pleural thickening due to asbestos

History of asbestos exposure or evidence of pleural plaques on CT

And

a/. Stable or improving CT appearances with follow-up for at least 12 months.(The development of enfolded lung is allowed)

Or

b/. Negative thoracoscopy (benign pleural biopsy)

Congestive Cardiac Failure

a/.History and examination features of CCF

or

b/. Evidence of at least moderate LV systolic or diastolic failure or severe valvular disease on echo

Or

c/. Improvement of effusion and symptoms with diuretic therapy

CABG

- CABG in 3 months prior to development of pleural effusion in the absence of an alternative cause

Hepatic hydrothorax

- Known history or clinical presentation consistent with liver disease
- And
- Recurrent transudative pleural effusion
- And
- Negative cytology

Renal failure or hypoalbuminaemia

- Biochemical confirmation of renal failure or hypoalbuminaemia in the absence of clinical, radiological or pleural fluid analysis suspicious of an alternative cause.

TB pleuritis

- Culture or AAFB positive sputum, pleural fluid or pleural tissue

And

- Resolution of pleural effusion with anti TB therapy at 6 month follow-up.

Inflammatory pleuritis (Non-specific pleuritis)

Demonstration of non-specific inflammatory pleuritis on pleural biopsy

And

Presentation not in keeping with parapneumonic effusion (see above)

And

Follow-up for 12 months without progression that would suggest a malignant cause.

Undiagnosed

Exhaustive investigations including 12 months follow-up with interval CT scans has not demonstrated a diagnosis

Or

Patient unfit for further investigation and follow up

Or

Patient died without definitive diagnosis and no post mortem examination conducted

1. Leung, A.N., N.L. Muller, and R.R. Miller, *CT in differential diagnosis of diffuse pleural disease*. AJR Am J Roentgenol, 1990. **154**(3): p. 487-92.