Does This Patient Have a Pleural Effusion?

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Etiology

Excess of fluid entering the pleural cavity either through the lung interstitium or the peritoneal cavity, beyond the capacity of lymphatic drainage

Gross Divison

Pleural Fluid (PF)

- PF protein/serum >0.5
- PF LDH/serum >0.6
- PF LDH >2/3 serum normal upper limit
  - ❖Serum - PF protein > 3.1 g/dL

Transudate – systemic factors

- LV failure
- Cirrhosis

Exudate – local factors

- Bacterial Pneumonia
- Malignancy
- Viral Infection
- PE

LV Failure

- Diagnostic Thoracocentesis indicated:
  - Effusion not bilateral
  - Patient is febrile
  - Presence of pleuritic pain
- Diuretics otherwise
- NT-proBNP>1500 pg/ml diagnostic

Hepatic Hydrothorax

- Movement of fluid through holes in the diaphragm
- Usually rt. Sided, produces dyspnea
- ~5% of patients with cirrhosis and ascites

Parapneumonic Effusion

- Common causes
  - Bacterial pneumonia
  - Lung abscess
  - Bronchiectasis
- A therapeutic Thoracocentesis is indicated if free fluid separates pleural borders by 10 mm.
- Resistant effusion necessitates a more invasive approach.

Malignancy

- Manifested by Dyspnea
- 75% attributed to
  - Lung carcinoma
  - Breast carcinoma
  - Lymphoma
- Diagnosis by Cytology or Thoracoscopy
- Treated symptomatically

PE

- Most commonly exudate
- Diagnosis is established by spiral CT or pulmonary arteriography
- Treatment: same as PE
- Might increase after anticoagulation due to Hemothorax, Recurrent embolus or infection

“Does this patient Have a Pleural Effusion?”

Goal : To systematically review the evidence regarding the accuracy of the physical examination in assesing the probability of pleural effusion

Stated Otherwise..

- Which of the following technique is highly indicative of pleural effusion (compared to imaging modality)?
  - Conventional percussion
  - Auscultatory percussion
  - Breath sounds
  - Chest expansion
  - Tactile vocal fremitus
  - Vocal resonance
  - Crackles
  - Pleural friction rub

Auscultatory Percussion

- Patient sitting upright for 5 min.
- The diaphragm of the Stethoscope should be placed on the posterior chest wall, 3cm below the rib cage, midscapular line
- Percussion should be applied in at least 3 vertical line, dullness indicates normally ventilated lung

Inclusion Criteria

- Use of appropriate reference standard
- Application of same diagnostic criteria
- Inclusion of patients with and without pleural effusion
- Primary data available

Data Extraction

- Five studies (out of 310) met inclusion criteria (N=934).
- Information was extracted by the three authors independently.
- For each study sen., spe., Positive and Negative Likelihood ratios and diagnostic OR were calculated

Results

- High positive LR:
  - Conventional Percussion (8.7; CI 2.2-33.8)
  - Asymmetric chest expansion (8.1; CI 5.2-12.7)
- Lowest Negative LR:
  - Absence of reduced tactile fremitus (0.21; CI 0.12-0.37)

Bottom line

- In population at high risk, dullness to percussion makes pleural effusion much more likely. A chest radiograph should be obtained.
- In population at low risk, the absence of tactile vocal fremitus makes pleural effusion less likely. A chest radiograph may not be needed.

Limitations

- Radiograph interpretation is subjective.
- Population heterogeneity
- Examiners ranging in clinical skills
- Body habitus heterogeneity
- Size of effusion heterogeneity
- Publication bias

Clinical Case

- 57-year-old w… tory of Asthma, HTN, disl… ith 2 day Dyspne… to pleural effusio… remitus and du… rcussion bilateral…

What is the most accurate physical maneuver for determining if this patient has a pleural effusion?

Case Continued

- The presence of dullness to convention percussion increases (LR 8.7) the probability of pleural effusion to 64%.
- The patient proceed to a chest radiograph, which confirmed cardiomegaly, intersitial edema and bilateral pleural effusions.