Pleural Effusions

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KEYWORDS

• Pleura • Pleural effusion • Empyema • Parapneumonic effusion
• Malignant pleural effusion

Approximately 1.5 million people develop a pleural effusion in the United States each year.[1] There are many different causes of pleural effusions (**Box 1**). When a patient is seen who has a pleural effusion, efforts should be made to find the cause of the effusion so that appropriate treatment can be instituted. In this article an approach to the diagnosis of pleural effusions is suggested and the diagnosis and management of the most common causes of pleural effusion are discussed.

SEPARATION OF EXUDATES FROM TRANSUDATES

One of the main reasons to do a thoracentesis in a patient with an undiagnosed pleural effusion is to determine whether the patient has a transudative or an exudative pleural effusion. The reason to make this differentiation is that the existence of a transudative pleural effusion indicates that systemic factors such as heart failure or cirrhosis are responsible for the effusion, whereas the existence of an exudative effusion indicates that local factors are responsible for the effusion. If the patient has a transudative effusion, the systemic abnormality can be treated and no attention need be diverted to the pleura. Alternatively, if an exudative effusion is present investigations need to be directed toward the pleura to find out the cause of the local problem.

For the past several decades, the principal manner by which transudates and exudates are identified is with the Light criteria.[2] According to the Light criteria, an exudative effusion is present if one or more of the following conditions are met: (1) pleural fluid protein/serum protein level greater than 0.5, (2) pleural fluid lactic acid dehydrogenase (LDH)/serum LDH level greater than 0.6, or (3) pleural fluid LDH level greater than two-thirds the upper normal limit for serum LDH.

The primary problem with the Light criteria is that they identify 15% to 20% of transudative effusions as exudative effusions. This situation is particularly likely if the patient has been receiving diuretics before the thoracentesis.[3] If the patient has CHF or cirrhosis but the pleural fluid meets exudative criteria by a small amount, then the difference between the serum protein and the pleural fluid protein should

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Box 1
Differential diagnoses of pleural effusion

1. Transudative pleural effusions
   a. Congestive heart failure (CHF)
   b. Cirrhosis
   c. Nephrotic syndrome
   d. Superior vena caval obstruction
   e. Fontan procedure
   f. Urinothorax
   g. Peritoneal dialysis
   h. Glomerulonephritis
   i. Myxedema
   j. Cerebrospinal fluid leak to pleura
   k. Hypoalbuminemia
2. Exudative pleural effusions
   a. Neoplastic diseases
      i. Metastatic disease
      ii. Mesothelioma
      iii. Body cavity lymphoma
      iv. Pyothorax-associated lymphoma
   b. Infectious diseases
      i. Bacterial infections
      ii. Tuberculosis
      iii. Fungal infections
      iv. Parasitic infections
      v. Viral infections
   c. Pulmonary embolization
   d. Gastrointestinal disease
      i. Pancreatic disease
      ii. Subphrenic abscess
      iii. Intrahepatic abscess
      iv. Intrasplenic abscess
      v. Esophageal perforation
      vi. Postabdominal surgery
      vii. Diaphragmatic hernia
      viii. Endoscopic variceal sclerosis
      ix. Postliver transplant
   e. Heart diseases
      i. Postcoronary artery bypass graft (post-CABG) surgery
      ii. Postcardiac injury (Dressler) syndrome