Lymphocytic Interstitial Pneumonitis This rare form of ILD occurs in adults, some of whom have an autoimmune disease or dysproteinemia. It has been reported in patients with Sjögren syndrome and HIV infection.

Lymphomatoid Granulomatosis • *CLINICAL MANIFESTATIONS* Pulmonary lymphomatoid granulomatosis generally presents predominantly in men between the ages of 30 and 50, although patients can be affected at any age. The effects of race and geography on disease incidence are not known, although a higher diagnosis rate is reported in Western countries. Although it may affect virtually any organ, it is most frequently characterized by pulmonary (>90%), skin, and central nervous system involvement. The most common presenting symptoms and signs include cough, fever, rash/nodules, malaise, weight loss, neurologic abnormalities, dyspnea, and chest pain.

HISTOLOGIC FINDINGS This multisystem disorder of unknown etiology is an angiocentric malignant (T cell) lymphoma characterized by a polymorphic lymphoid infiltrate, an angiitis, and granulomatosis.

TREATMENT The clinical course of lymphomatoid granulomatosis ranges from remission without treatment to death from malignant lymphoma within 2 years. The choice of a treatment strategy should be based upon the presence of symptoms, history of using an inciting medication, extent of extrapulmonary involvement, and careful assessment of the histopathologic grade of the lesion. Referral to a hematology oncology specialist for consultation is recommended.

BRONCHOCENTRIC GRANULOMATOSIS

Clinical Manifestations Rather than a specific clinical entity, bronchocentric granulomatosis (BG) is a descriptive histologic term that is applied to an uncommon and nonspecific pathologic response to a variety of airway injuries. There is evidence that BG is caused by a hypersensitivity reaction to *Aspergillus* or other fungi in patients with asthma. About one-half of the patients described have had chronic asthma with severe wheezing and peripheral blood eosinophilia. In patients with asthma, BG probably represents one pathologic manifestation of allergic bronchopulmonary aspergillosis or another allergic mycosis. In patients without asthma, BG has been associated with RA and a variety of infections, including tuberculosis, echinococcosis, histoplasmosis, coccidioidomycosis, and nocardiosis. The chest roentgenogram reveals irregularly shaped nodular or mass lesions with ill-defined margins, which are usually unilateral and solitary, with upper lobe predominance.

Histologic Findings Bronchocentric granulomatosis is characterized by peribronchial and peribronchiolar necrotizing granulomatous inflammation. Destruction of airway walls and adjacent parenchyma leads to granulomatous replacement of mucosa and submucosa by palisading, epithelioid, and multinucleated histiocytes. Bronchocentric granulomatosis does not typically involve the pulmonary arteries.

Treatment Glucocorticoids are the treatment of choice, often with an excellent outcome, although recurrences may occur as therapy is tapered or stopped.

GLOBAL CONSIDERATIONS

Limited epidemiologic data exist describing the prevalence or incidence of ILD in the general population. With a few exceptions, e.g., sarcoidosis and certain occupational and environmental exposures, there appear to be no significant differences in the prevalence or incidence of ILD among various populations. For sarcoidosis, there are important environmental, racial, and genetic differences (Chap. 390).

316 Disorders of the Pleura

Richard W. Light

PLEURAL EFFUSION

The pleural space lies between the lung and the chest wall and normally contains a very thin layer of fluid, which serves as a coupling system. A pleural effusion is present when there is an excess quantity of fluid in the pleural space.

Etiology Pleural fluid accumulates when pleural fluid formation exceeds pleural fluid absorption. Normally, fluid enters the pleural space from the capillaries in the parietal pleura and is removed via the lymphatics in the parietal pleura. Fluid also can enter the pleural space from the interstitial spaces of the lung via the visceral pleura or from the peritoneal cavity via small holes in the diaphragm. The lymphatics have the capacity to absorb 20 times more fluid than is formed normally. Accordingly, a pleural effusion may develop when there is excess pleural fluid formation (from the interstitial spaces of the lung, the parietal pleura, or the peritoneal cavity) or when there is decreased fluid removal by the lymphatics.

Diagnostic Approach Patients suspected of having a pleural effusion should undergo chest imaging to diagnose its extent. Chest ultrasound has replaced the lateral decubitus x-ray in the evaluation of suspected pleural effusions and as a guide to thoracentesis. When a patient is found to have a pleural effusion, an effort should be made to determine the cause (Fig. 316-1). The first step is to determine whether the effusion is a transudate or an exudate. A *transudative pleural effusion* occurs when *systemic factors* that influence the formation and absorption of pleural fluid are altered. The leading causes of transudative pleural effusions in the United States are left ventricular failure and cirrhosis. An *exudative pleural effusion* occurs when *local factors* that influence the formation and absorption of pleural fluid are altered. The leading causes of exudative pleural effusions are bacterial pneumonia, malignancy, viral infection, and pulmonary embolism. The primary reason for making this differentiation is that additional diagnostic procedures are indicated with exudative effusions to define the cause of the local disease.

Transudative and exudative pleural effusions are distinguished by measuring the lactate dehydrogenase (LDH) and protein levels in the pleural fluid. Exudative pleural effusions meet at least one of the following criteria, whereas transudative pleural effusions meet none:

1. Pleural fluid protein/serum protein >0.5
2. Pleural fluid LDH/serum LDH >0.6
3. Pleural fluid LDH more than two-thirds the normal upper limit for serum

These criteria misidentify ~25% of transudates as exudates. If one or more of the exudative criteria are met and the patient is clinically thought to have a condition producing a transudative effusion, the difference between the protein levels in the serum and the pleural fluid should be measured. If this gradient is >31 g/L (3.1 g/dL), the exudative categorization by these criteria can be ignored because almost all such patients have a transudative pleural effusion.

If a patient has an exudative pleural effusion, the following tests on the pleural fluid should be obtained: description of the appearance of the fluid, glucose level, differential cell count, microbiologic studies, and cytology.

Effusion Due to Heart Failure The most common cause of pleural effusion is left ventricular failure. The effusion occurs because the increased amounts of fluid in the lung interstitial spaces exit in part across the visceral pleura; this overwhelms the capacity of the lymphatics in the parietal pleura to remove fluid. In patients with heart failure,