

two pleural cavities laterally, the diaphragm inferiorly, and the thoracic inlet superiorly. The mediastinal space can be divided into three compartments: anterior, middle, and posterior. The localization of mediastinal masses in one of these compartments assists in the differential diagnosis (Fig. 20-1).

The anterior mediastinal compartment is anterior to the pericardium and includes lymphatic tissue, the thymus, and the great veins. Lesions most commonly found in the anterior mediastinum are thymomas, germ cell tumors, lymphomas, intrathoracic thyroid tissue, and parathyroid lesions. Thymomas comprise 20% of mediastinal neoplasms in adults, and they are the most common anterior mediastinal primary neoplasm in adults. Symptoms due to myasthenia gravis may affect one third of patients with thymomas. Middle mediastinal lesions include tracheal masses, bronchogenic and pericardial cysts, enlarged lymph nodes, and proximal aortic disease (i.e., aneurysm or dissection). Posterior mediastinal masses include neurogenic tumors and cysts, meningocele, lymphoma, aneurysm of the descending aorta, and esophageal disorders such as diverticula and neoplasms.

Patients with systemic lymphoma often have involvement of the mediastinum, and 5% to 10% of patients with lymphoma have primary mediastinal lesions at clinical presentation. Mediastinal cysts can arise in the pericardium, bronchi, esophagus or stomach, thymus, and thoracic duct, and although benign, they can produce compressive symptoms. Lung cancer can manifest with mediastinal adenopathy, a sign of advanced stage (see E-Fig. 20-3).

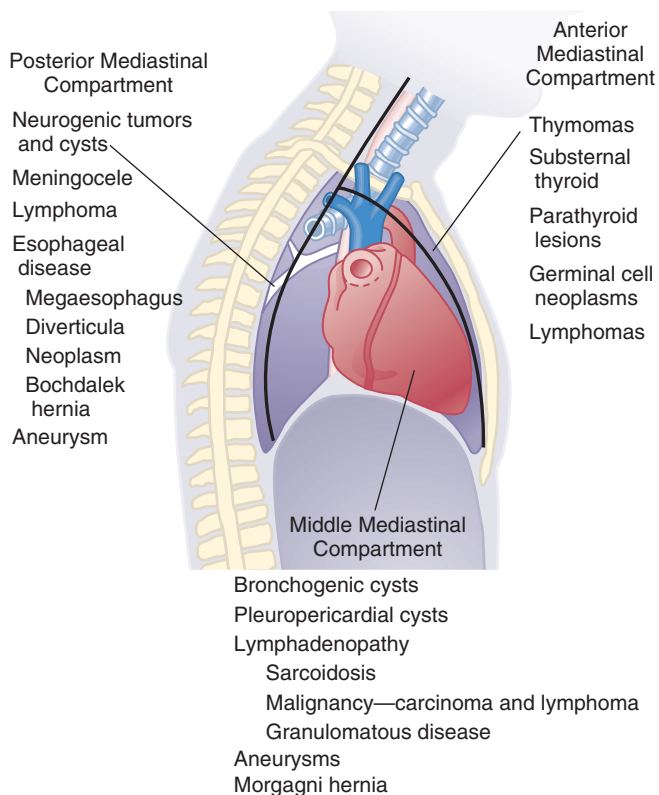


FIGURE 20-1 Masses of the mediastinum and their anatomic locations.

Treatment of a mediastinal mass depends on the underlying pathology. Many require surgical resection, irradiation, chemotherapy, or careful monitoring over time.

Mediastinitis

Inflammation of the mediastinal structures can be acute or chronic. Acute mediastinitis is a rapidly progressive condition due to infection, and it most commonly complicates cardiothoracic surgical procedures or occurs as a result of trauma. Chest imaging studies may show a widening of the mediastinum, pneumothorax, or hydrothorax. Treatment requires antibiotics, pleural drainage, and mediastinal evacuation.

Chronic mediastinitis (i.e., fibrosing mediastinitis) is a progressive illness that results from fungal or granulomatous infections, neoplasms, radiotherapy, or occasionally drugs such as methysergide; it may be idiopathic. Patients usually remain asymptomatic until vascular, respiratory, or neurologic structures are affected; tracheobronchial narrowing is the most common manifestation. Diagnosis and treatment often require surgical intervention, although no treatment is highly successful.

CHEST WALL DISEASE

The chest wall is composed of the bony structures of the rib cage, the articulations between the ribs and the vertebrae, the diaphragm, and other respiratory muscles. Normal function of this ventilatory pump is needed to bring oxygen from the atmosphere into the body. A wide variety of chest wall and neuromuscular disorders can result in dysfunction of the ventilatory pump. These disorders typically result in a restrictive dysfunction characterized by a reduction in total lung capacity and vital capacity with a normal residual volume. Hypoventilation may ensue, resulting in hypercapnia, atelectasis, and hypoxemia.

Skeletal Disease

Kyphoscoliosis and ankylosing spondylitis are disorders that involve the spine and its articulations. Pectus excavatum involves the sternum, flail chest affects the ribs, and obesity adds to the soft tissue mass of the chest wall. These disorders primarily affect the respiratory system by stiffening its tissues. Of these disorders, kyphoscoliosis produces the most severe restrictive impairment, and ankylosing spondylitis and pectus excavatum cause little respiratory compromise.

Kyphoscoliosis refers to a group of disorders characterized by excessive spinal curvature in the lateral plane (i.e., scoliosis) and sagittal plane (i.e., kyphosis). The degree of curvature can be assessed by measuring the Cobb angle (Fig. 20-2). Greater degrees of spinal curvature are associated with greater restriction and an increased risk of respiratory failure (E-Fig. 20-5).

Kyphoscoliosis may be idiopathic, caused by neuromuscular disease, or associated with congenital vertebral malformations. Idiopathic kyphoscoliosis is the most common form, usually manifesting in late childhood or early adolescence and affecting females more than males (ratio of 4 : 1). It is thought to be a multigene condition with an autosomal or sex-linked inheritance pattern and variable phenotypic expression. A defect in the chromatin-remodeling gene (*CHD7*) has been associated with idiopathic kyphoscoliosis.