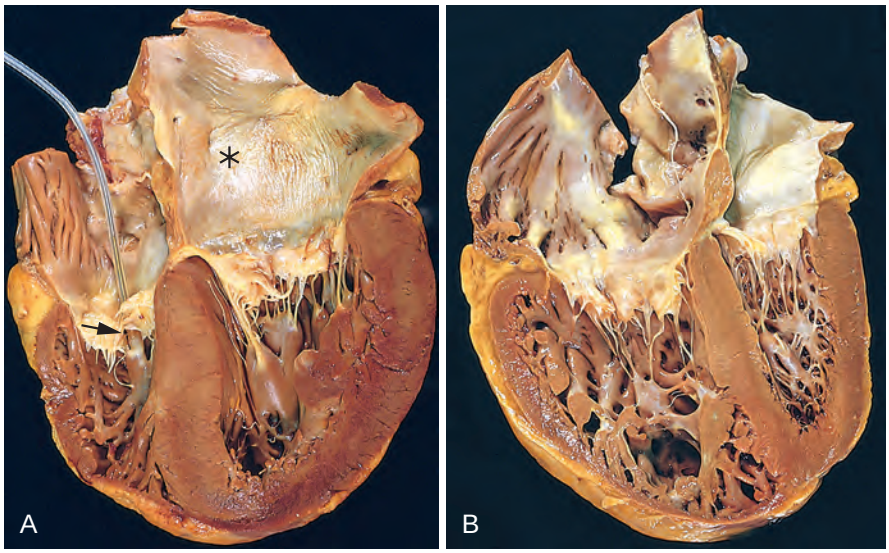

Figure 12-20 Hypertensive heart disease, systemic and pulmonary. **A,** Systemic (left-sided) hypertensive heart disease. There is marked concentric thickening of the left ventricular wall causing reduction in lumen size. The left ventricle and left atrium (*asterisk*) are on the *right* in this apical four-chamber view of the heart. A pacemaker is present in the right ventricle *(arrow)*. **B,** Pulmonary (right-sided) hypertensive heart disease (cor pulmonale). The right ventricle is markedly dilated and has a thickened free wall and hypertrophied trabeculae (apical four-chamber view of heart, right ventricle on *left*). The shape of the left ventricle (to the *right*) has been distorted by the enlarged right ventricle.

hypertension, or (4) experience progressive heart failure or SCD. Effective control of hypertension can prevent cardiac hypertrophy, or can lead to its regression; with normalization of the blood pressure, the associated risks of HHD are diminished.

Pulmonary (Right-Sided) Hypertensive Heart Disease (Cor Pulmonale)

Normally, because the pulmonary vasculature is the low pressure side of the circulation, the right ventricle has a thinner and more compliant wall than the left ventricle. Isolated pulmonary HHD, or *cor pulmonale*, stems from right ventricular pressure overload. Chronic cor pulmonale is characterized by right ventricular hypertrophy, dilation, and potentially right-sided failure. Typical causes of *chronic* cor pulmonale are disorders of the lungs, especially chronic parenchymal diseases such as emphysema, and primary pulmonary hypertension (Table 12-7; see also Chapter 15). *Acute* cor pulmonale can follow massive pulmonary embolism. Nevertheless, it should also be remembered that pulmonary hypertension *most commonly occurs as a complication of left-sided heart disease.*

Table 12-7 Disorders Predisposing to Cor Pulmonale

Diseases of the Pulmonary Parenchyma
Chronic obstructive pulmonary disease
Diffuse pulmonary interstitial fibrosis
Pneumoconioses
Cystic fibrosis
Bronchiectasis
Diseases of the Pulmonary Vessels
Recurrent pulmonary thromboembolism
Primary pulmonary hypertension
Extensive pulmonary arteritis (e.g., granulomatosis with polyangiitis)
Drug-, toxin-, or radiation-induced vascular obstruction
Extensive pulmonary tumor microembolism
Disorders Affecting Chest Movement
Kyphoscoliosis
Marked obesity (sleep apnea, pickwickian syndrome)
Neuromuscular diseases
Disorders Inducing Pulmonary Arterial Constriction
Metabolic acidosis
Hypoxemia
Chronic altitude sickness
Obstruction of major airways
Idiopathic alveolar hypoventilation

MORPHOLOGY

In acute cor pulmonale there is marked dilation of the right ventricle without hypertrophy. On cross-section the normal crescent shape of the right ventricle is transformed to a dilated ovoid. In chronic cor pulmonale the right ventricular wall thickens, sometimes up to 1.0 cm or more (Fig. 12-20*B*). More subtle right ventricular hypertrophy may take the form of thickening of the muscle bundles in the outflow tract, immediately below the pulmonary valve, or thickening of the moderator band, the muscle bundle that connects the ventricular septum to the anterior right ventricular papillary muscle. Sometimes, the hypertrophied right ventricle compresses the left ventricular chamber, or leads to regurgitation and fibrous thickening of the tricuspid valve.

KEY CONCEPTS

Hypertensive Heart Disease

- Hypertensive heart disease can affect either the left ventricle or the right ventricle; the latter is called *cor pulmonale*. Elevated pressures induce myocyte hypertrophy and interstitial fibrosis that increases wall thickness and myocardial stiffness.
- The chronic pressure overload of systemic hypertension causes left ventricular concentric hypertrophy, often associated with left atrial dilation due to impaired diastolic filling of the ventricle. Persistently elevated pressure overload can cause ventricular failure with dilation.
- Cor pulmonale results from pulmonary hypertension due to primary lung parenchymal or vascular disorders. There is commonly right ventricular and right atrial hypertrophy; right ventricular and atrial dilation can occur.