catheter-directed infusion of thrombolytic therapy or percutaneous thrombus extraction. Irreversible tissue necrosis, regardless of the cause, should be treated with emergent amputation rather than revascularization to reduce the risk of kidney failure (myoglobinuria), sepsis, and multiorgan failure.

Aortic Aneurysm

Abdominal aortic aneurysm (AAA) is a common vascular disease in older adults, affecting 4% to 8% of men and 0.5% to 1.5% of women older than 65 years of age. Thoracic aortic aneurysm is much less prevalent (0.4% to 0.5%). Besides age, the major risk factors for AAAs are cigarette smoking, hypertension, and a family history of aortic aneurysms. Atherosclerosis is responsible for most cases of AAA, but other causes include cystic medial necrosis (Marfan syndrome, Ehlers-Danlos syndrome), vasculitis with connective tissue disease (Takayasu's arteritis, giant-cell arteritis), chronic infection (syphilitic aortitis), and trauma. AAAs grow gradually, at an average rate of 1 to 4 mm/year. The risk of rupture is low until the diameter reaches 5 cm, and then it increases exponentially. The risk of aortic rupture is 1% per year for aneurysms between 3.5 and 4.9 cm in diameter and 5% per year for aneurysms larger than 5 cm.

Most patients with AAA are asymptomatic, but some develop vascular complications such as aneurysm expansion with compression of adjacent structures. Occasionally, mural thrombi form within the aneurysm and embolize, causing acute occlusion of distal arterial segments. Patients with iliac aneurysm may develop hydronephrosis or recurrent urinary tract infections from ureteral compression. Others develop neurologic symptoms from compression of sciatic or femoral nerves. The classic physical finding is a pulsatile, nontender mass below the umbilicus (distal to the origin of the renal arteries). In thin patients, normal aortic pulsations are often palpable but above the umbilicus. Hypotension and acute abdominal pain should prompt consideration of aneurysm rupture, which requires emergent operative repair. Duplex ultrasonography is an accurate and reliable diagnostic tool for abdominal aortic and iliac aneurysms. Routine screening for AAA with ultrasonography is recommended for all men between the ages of 65 and 75 years and for men older than 60 years of age with a family history of AAA among first-degree relatives. Such screening is of proven benefit in reducing mortality. CT and MR angiography allow visualization of the thoracic and abdominal aorta as well as the iliac arteries and its branches (Fig. 12-2).

Medical treatment for aortic aneurysm includes smoking cessation, tight BP control, and cholesterol reduction. β-Blockade reduces the rate of aortic root enlargement in patients with Marfan syndrome but has not proved beneficial in patients with AAA from other causes. Patients with large aneurysms or rapid aneurysm expansion regardless of size should undergo aneurysm repair (Table 12-2). Elective AAA repair carries a perioperative mortality rate of 2% to 6%. Furthermore, a large randomized study failed to demonstrate any benefit of surgery in patients with aneurysms 4.0 to 5.5 cm in diameter (level A evidence). For these reasons, patients with small aortic aneurysms should be treated medically with close monitoring of aneurysm size by periodic imaging studies every 6 to 12 months (see Table 12-2).

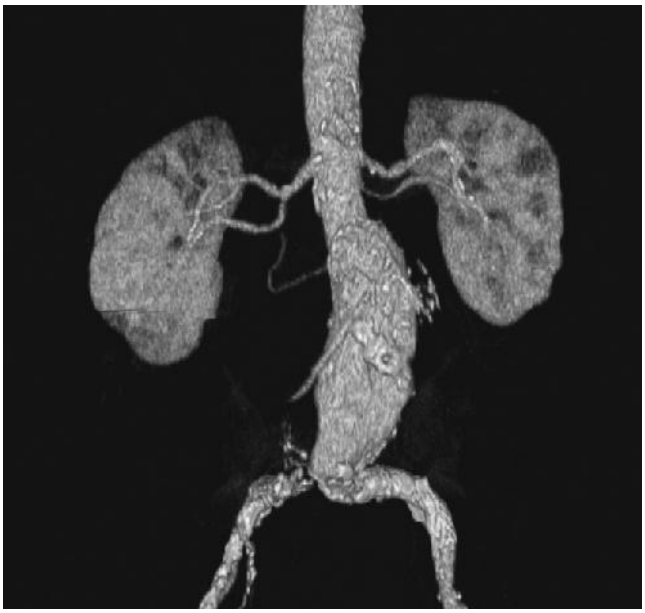

FIGURE 12-2 Computed tomographic angiogram of the distal abdominal aorta shows abdominal aortic aneurysm, 6.2 cm in largest diameter, with severe stenosis at the origin of the right common iliac artery. (Courtesy Bart Domatch, MD, Radiology Department, University of Texas Southwestern Medical Center, Dallas, Tex.)

TABLE 12-2 INDICATIONS FOR SURGICAL TREATMENT OF ARTERIAL ANEURYSMS

Symptoms from expansion of aneurysm or compression of adjacent structure
Rupture of aneurysm
Rapid aortic aneurysm expansion of ≥1 cm/yr
Large aneurysm
Ascending aorta >4.5 cm for patients with Marfan syndrome and >5.0 cm for all others
Aortic arch >5.5 cm
Descending thoracic aorta >5.0 cm
Abdominal aorta >5.5 cm
Iliac aneurysm >3 cm

Percutaneous endovascular aneurysm repair (EVAR) is an alternative to open surgical repair for treatment of AAA. EVAR offers a lower rate of perioperative death than surgical repair with equivalent long-term survival (level A evidence). However, EVAR should be reserved for patients who are able to return for follow-up visits and repeated imaging studies of the aneurysm site to ensure that the stent graft is free from endovascular leaks or displacement (level A evidence). EVAR has not been shown to improve mortality in patients with multiple comorbidities, who are considered to be unfit for surgery, when compared to conservative management. Therefore, it should be offered only to selected patients with symptoms from compression of adjacent organs or vascular complications.

Aortic Dissection

In aortic dissection, the intimal layer is torn from the aortic wall, resulting in the formation of a false lumen in parallel with the true lumen. Risk factors include hypertension, cocaine use, trauma, hereditary connective tissue disease (e.g., Marfan syndrome, Ehlers-Danlos syndrome), vasculitis (e.g., Takayasu's arteritis, giant-cell arteritis), Behçet's disease, bicuspid aortic valve, and