SJHG Heartbeat

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AAA Update

Rupture of an abdominal aortic aneurysm (AAA) is a lethal complication of this relatively common pathology (5% of men > 50 years of age), and currently early surgery is the only preventative measure. Early diagnosis, prevention, and management are key elements of treatment. There is a lot of information about patient screening, diagnosis and treatment of AAAs. This *Heartbeat* will review information from the 2006 American College of Cardiology (ACC) and American Heart Association (AHA) guidelines on peripheral vascular disease, which includes aortic aneurysm, and outline a plan of action for detection and management based on these guidelines (algorithm in appendix).[1]

Introduction/Screening:

An aneurysm is a focal dilation of a blood vessel with respect to the original or adjacent artery. An abdominal aortic aneurysm is defined as an aortic diameter at least one and one-half times the diameter measured at the level of the renal arteries. The normal value at this level is approximately 2.0 cm (range 1.4 to 3.0 cm) in most individuals. In contrast an AAA is considered to be present when the minimum anterior-posterior diameter reaches 3.0 cm. Incidence is about 3 to 5 x higher in men than women, especially in those with a history of smoking. Risk factors for AAA include advancing age, family history (particularly first-degree relatives), male gender, and tobacco use. Recently a number of studies have shown that screening for aortic aneurysm disease in men is effective in terms of detection and decreasing mortality. The ACC/AHA guideline recommendations on *who should be screened* are outlined below. The data do not support AAA screening for men who have never smoked or for women.

Screening High-Risk Populations for Abdominal Aortic Aneurysms (AAA)

- Men 60 years of age or older who are either the siblings or offspring of patients with AAAs should undergo physical examination and ultrasound screening for detection of aortic aneurysms.

- Men who are 65 to 75 years of age who have ever smoked should undergo a physical examination and one-time ultrasound screening for detection of AAAs.

Most AAAs are asymptomatic and are discovered incidentally on routine physical exam or by radiology performed for unrelated indications. The United States Preventive Services Task Force recently reported the results of a meta-analysis supporting the concept of screening for AAA and of surgical repair for large AAAs (5.5 cm or more) in men aged 65 to 75 years who have ever smoked (inclusive of both current and former smokers).[2] Such screening leads to decreased AAA-specific mortality when abdominal ultrasonography is performed followed by appropriate patient management and intervention.

Abdominal ultrasonography is considered the screening modality of choice for AAAs because of its high sensitivity and specificity, as well as its safety and relatively low cost. Both abdominal CT and MRI are viable alternatives and appear to be highly accurate tests for AAAs, but they are more expensive than the abdominal ultrasonography. Patients who have an AAA should have an exam of their entire aorta to detect aneurysms in other locations (13% have aneurysms elsewhere).

Medical Management

Arterial aneurysms regardless of size are cardiovascular disease (CVD), pose the same risk as those with known coronary artery disease (CAD or peripheral arterial disease (PAD), and should be treated accordingly with appropriate risk reduction therapies. Blood pressure (BP) and fasting lipid values should be monitored and treated to appropriate goals (BP < 120/80 and LDL-C to < 100mg/dL). Patients with aneurysms or a family history should be advised to discontinue smoking and offered smoking cessation interventions. **Therapeutic lifestyle changes (TLC)—diet/exercise/smoking cessation**—should be part of every CVD primary or secondary prevention program.

It is the majority opinion of SJHG cardiologists that all patients with CAD should be on **ACE-inhibitor therapy**. Recent data showed that this therapy is associated with reduced risk of ruptured AAA unlike other antihypertensive agents—suggesting the effect may be independent of BP reduction—possibly a reduction in endothelial dysfunction.[3] I would support their usage in patients with AAA. The management of AAA is predicated on following the diameter of the aorta and recommending surgery or endovascular repair for certain sizes dependent on risk. I wouldn't prescribe ACE inhibitors instead of surgery for those with large aneurysms (> 5.5 cm) but would certainly place those whom are not surgical candidates on ACE inhibitor therapy. I would use the highest tolerated dose based on the HOPE trial results, which showed that higher doses are more beneficial for risk reduction than lower doses.[4]

Blood pressure control and smoking cessation are the most important elements of care. In our opinion, because most of these patients probably have co-existing CAD and endothelial dysfunction, it makes sense that **beta-blockers** and ACE-inhibitors would be the anti-hypertensive agents of choice. **Statins** should be the lipid-lowering agent of first-choice.

Surgical Intervention/Management

Pain is the most frequent complaint in patients with symptomatic AAAs and usually is located in the hypogastrium or the lower part of the back. Pain is typically steady, lasting for hours to days at a time, and has a gnawing quality. Expansion and impending rupture are heralded by the development of new or worsening pain, characteristically constant, severe, and located in the back or lower part of the abdomen, sometimes with radiation into the groin, buttocks, or legs. Rupture is associated with abrupt onset of back pain, abdominal pain, and tenderness. **In patients with the clinical triad of abdominal and/or back pain, a pulsatile abdominal mass, and hypotension, immediate surgical evaluation is indicated**, **regardless of size**. However, this pathognomonic triad occurs in only about one-third of cases.[5]

Elective Surgical Repair: When? Good data suggest that anyone with an aneurysm 5 to 5.5 cm probably has a rupture rate roughly = or > the risk of surgical repair. Several good studies suggest that for patients with aneurysms in the 4 to 5.5 cm range, watchful waiting is a very safe option. Two large studies, one in the United States and one in England, showed that in patients with aneurysms of 4 to 5.5 cm, randomized to either regular ultrasound follow-up or immediate surgery, there was no difference in mortality and there was a decreased need for surgery in the group that was followed with regular ultrasound surveillance (6 mo - 1x/yr minimum if > 5 cm). **Patients should be referred for elective surgery once their aneurysm has reached 5.5 cm.** According to ACC/AHA guidelines, intervention is not recommended for asymptomatic infrarenal or juxtarenal AAAs if they measure < 5.0 cm in men or < 4.5 cm in women.

Elective Surgical Repair: Open vs Endovascular? The guidelines suggest that open repair is indicated in patients who are good or average surgical candidates, with periodic long-term surveillance imaging performed. Endovascular repair is reasonable in patients at high risk of complications from open operations because of cardiopulmonary or other associated diseases and may be considered for patients at low or average surgical risk because of early survival advantage. In a review article of two recent randomized trials, which support these guidelines the authors suggest that, in good surgical candidates, no long-term survival advantage occurs for stent graft therapy.[6] Furthermore, stent graft therapy requires detailed surveillance because a high percentage of these patients develop postoperative complications (41% vs 9%) and costs were higher.

Some surgeons feel that a patient is a candidate for either procedure if their surgical risk is reasonable. If either approach is appropriate, the decision is dictated by their anatomy and their candidacy for endovascular repair, the patient's personal preference, and the preference of the surgeons to whom they are referred. All agree that if their surgical risk is high or prohibitive, it should be determined if they're candidates for endovascular repair (procedure of choice in higher risk patients).

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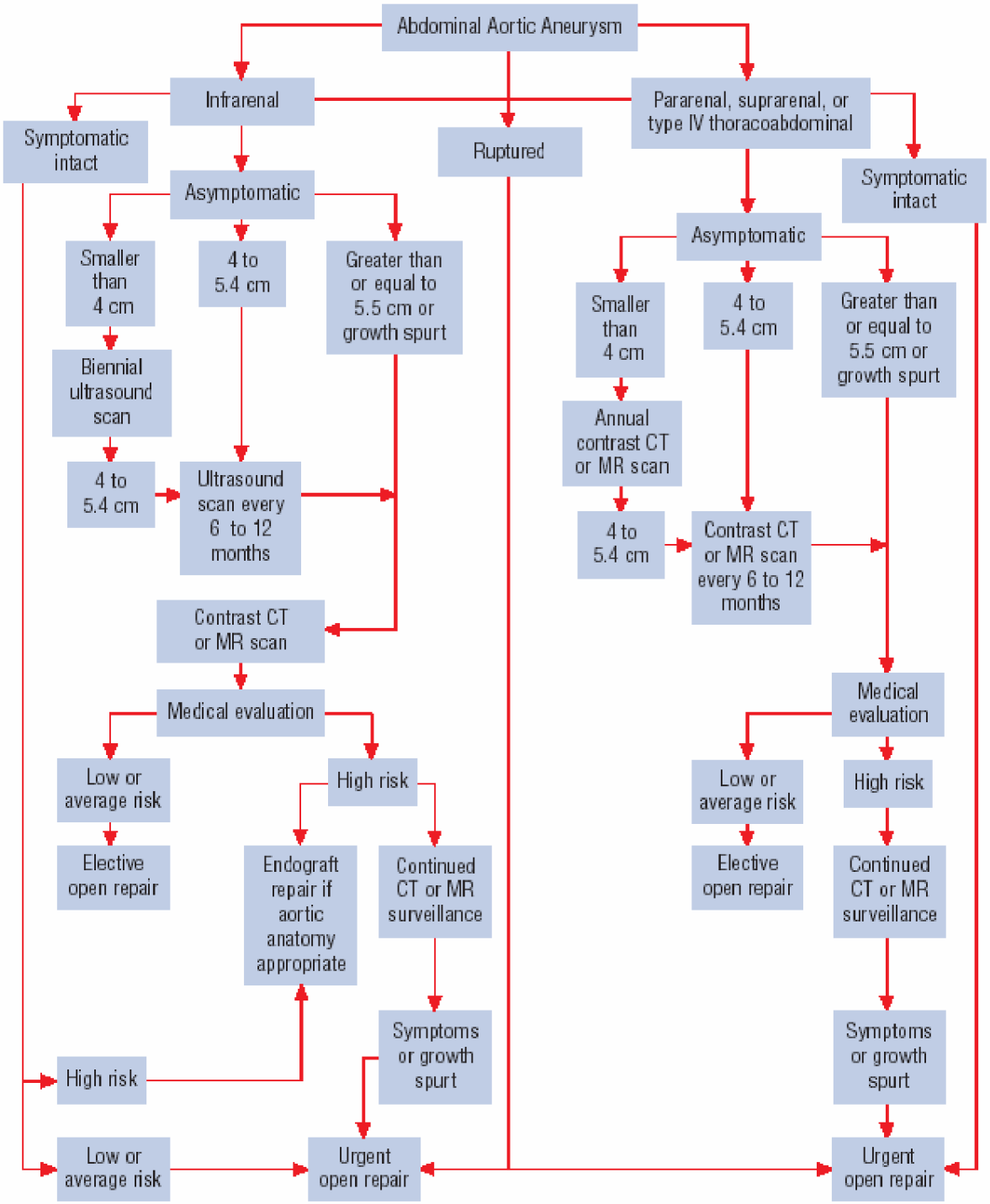
Figure 11. Management of Abdominal Aortic Aneurysms



CT = computed tomography; MR = magnetic resonance.