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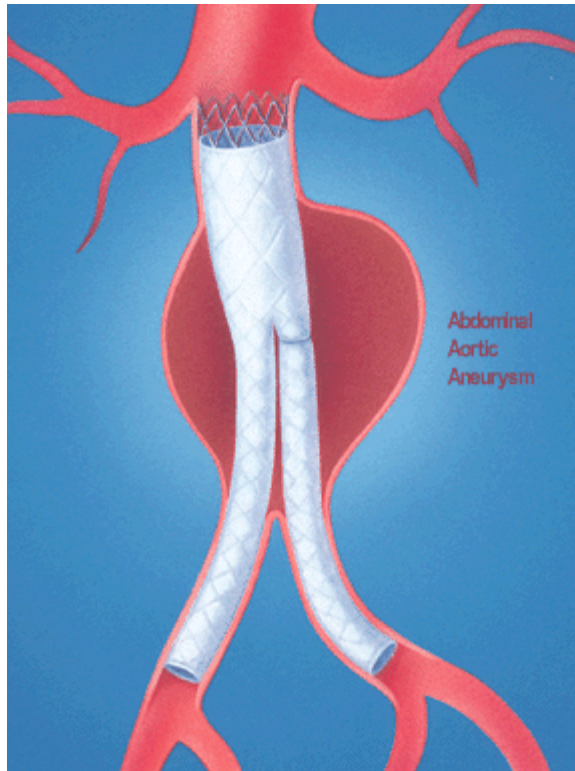
**Abdominal Aortic Aneurysm**

**What is an abdominal aortic aneurysm (AAA)?**

An aneurysm is a widening or ballooning of an artery, usually due to a weak area in the wall of the artery. Aneurysms can be caused by trauma to the artery wall, certain diseases and infections, or a congenital (present at birth) defect. An abdominal aortic aneurysm (AAA) is an aneurysm in the abdominal portion of the aorta, the largest blood vessel in the body.

The aorta leads from the heart through the chest and diaphragm to the lower abdomen. It then divides, forming the major arteries to the legs. Through its branch blood vessels, the aorta supplies blood to the entire body. In an AAA, The aorta slowly and progressively widens (dilates) and may balloon to four or five times its normal size. As it dilates, the aortic wall thins out and becomes weakened.

Aneurysms can clot, dissect (a small tear in the lining of the artery) or rupture (breaking open of the AAA causing profuse bleeding). If an AAA ruptures, the only chance of saving the patient is immediate emergency surgery to replace the ruptured aorta with either a bypass graft (a portion of blood vessel taken from another place in your body) or synthetic material. The illustration below shows an AAA repaired with a synthetic stent-graft.



### **What causes AAA?**

All arteries are made up of three layers - the intima (inner wall), the media (middle wall) and the adventitia (outer wall). Damage to the middle layer (the media) causes an AAA.

The most common cause of abdominal aortic aneurysm is atherosclerosis (hardening of the arteries). In the abdominal aorta, this disease process may lead to a weakening of the artery wall. High blood pressure may accelerate the development of AAA. In addition, there may be hereditary factors involved leading to a weakened aortic wall, as aneurysms tend to run in families. There is a strong association between AAA and cigarette smoking. Smokers die from ruptured aneurysms four times more often than nonsmokers. Aneurysms in smokers expand and weaken faster than do those in nonsmokers. Aneurysms may also result from tears in the artery wall (dissection of the aorta) and from infections of the vessel wall (mycotic aneurysm).

AAAs in children are usually caused by blunt trauma or a condition known as Marfan's syndrome.

### **Who is at Risk?**

AAA is most common in white men over 40, but can occur in anyone. AAA

occurs less frequently in white women and African Americans of both sexes. In children, abdominal aortic aneurysm can result from blunt abdominal injury or from Marfan's syndrome.

### **What are the Risks of AAA?**

AAAs are dangerous because often, people do not know that they have them until a medical emergency occurs. The AAA can dissect, which means that a tear develops in the lining of the artery. An AAA that dissects is at greater risk of rupture. This is a medical emergency where the aneurysm breaks open, resulting in profuse bleeding. Ruptured aneurysm occurs in approximately 5 out of 10,000 people. Survival rates after rupture are poor, so it is important to detect AAA prior to rupture.

### **Symptoms of Abdominal Aortic Aneurysm**

Abdominal aortic aneurysms usually produce no symptoms, especially when the size of the aneurysm is small. As the aneurysm grows, there may be mild abdominal discomfort, back pain, or groin pain. Some patients may feel a pulsatile (beating) mass in the abdomen. As the aneurysm starts to rupture, there is sudden, very severe abdominal or back pain. Immediate medical attention is critical to survival!

### **Diagnosis of Abdominal Aortic Aneurysm**

The AAA can often be felt as an abdominal mass that pulses with each heartbeat. This is typically discovered during a routine physical exam. In larger individuals, the AAA may not be felt even when it is quite large. Abdominal ultrasound is an easy accurate way to detect and follow abdominal aortic aneurysms. Using high frequency sound waves, the aneurysm size can be precisely measured. Since the risk of rupture is related to the size and rate of expansion of the aneurysm, periodic abdominal ultrasound examinations are routinely used to follow the aneurysm. Abdominal CT scans or MRI exams can also be helpful. Abdominal x-rays can show calcification in the abdominal aorta. The shape of this calcification can suggest that an aneurysm is present leading to more definitive studies such as ultrasound to make the diagnosis. If you are over 40 and have a family history of AAA, you should talk with your doctor about an ultrasound (an ultrasound is a safe, painless, non-invasive procedure) .

### **Treatment of Abdominal Aortic Aneurysm**

The size of the AAA is related to the risk of rupture. Larger AAAs (5-6 cm) pose a substantial risk of rupture, and are generally repaired surgically (unless the patient has factors that would make the operation too risky). The surgery is done under general anesthesia. The surgeon opens the abdomen, isolates the aneurysm and opens it. A woven tube graft is then sewn in and the aneurysm wall is sewn over the graft. Elective repair is quite successful with a hospital stay

of less than 10 days and recovery period of 6 to 8 weeks.

Some doctors disagree on how to treat smaller AAAs, as they pose a smaller risk of rupture. Many vascular surgeons recommend "watchful waiting" for smaller AAAs. This involves periodic followup with ultrasound scans. Some AAAs grow very slowly and remain stable over a long period of time. A rapidly growing AAA is a warning sign that needs to be addressed immediately.

Emergency repair of a leaking or ruptured AAA is quite another matter. These emergency operations are associated with a high rate of death and complications. For this reason, it is important to make the diagnosis early, to follow the aneurysm carefully with periodic ultrasound examinations, and to operate electively when the aneurysm reaches an appropriate size. Successful surgery for AAA usually results in full recovery. Abdominal aneurysms generally do not recur, and people with AAA are not particularly at risk from aneurysms in other locations. Because the underlying cause of AAA is usually hardening of the arteries, lifestyle changes to minimize the progression of the disease are indicated. These include avoidance of tobacco products, control of cholesterol, treatment of high blood pressure, avoidance of stress, treatment of diabetes and regular exercise.

### **Catheter Based Treatment for Abdominal Aortic Aneurysm**

A catheter based treatment for AAA is being developed to help avoid elective surgery for the repair of AAA. This new method, still in it's experimental phase, is available only at selected medical centers. This method involves inserting a catheter (tube) through a groin artery into the abdominal aorta. The catheter enables the delivery of a stent graft which is expanded using a removable balloon catheter. This process effectively bridges the aneurysm and removes the danger of rupture. This procedure is available only for nonemergency repair. Your doctor will help you determine if this procedure is right for you.

### **What are the Risks of Surgical Repair?**

Risks are related to several factors, including the experience of the hospital and surgeon and the health of the patient. Patients with a history of heart disease have increased risk, because the leading cause of death associated with surgery is a post-procedure heart attack. If you have coronary artery disease, discuss this with your physician prior to surgery. He/She will probably want to do a thorough evaluation.

### **What Can I Do To Improve My Condition?**

Give up smoking. Control your blood pressure. Adopt a mild exercise program. There are currently no drugs that have been proven to reduce the growth of AAAs, although propranolol shows some promise in early animal studies.

Avoid blunt trauma to the abdomen.

If you have any questions about this condition, please ask us.