



Abdominal aortic aneurysm

An accident waiting
to happen?

BY SUSAN O'LEARY

This article was originally printed in the September/October 2003 issue of CMA Today, published by the American Association of Medical Assistants, Chicago, IL.

Abdominal aortic aneurysm (AAA) is often called a "silent killer" because it has no obvious symptoms. Yet, when symptoms of an AAA occur, such as low back pain, it can be too late for effective treatment.

How does an AAA develop?

An aneurysm is an enlargement in an artery. An AAA is an aneurysm in the abdominal aorta, the large artery carrying blood from the heart to the rest of the body. Most often, an AAA occurs just below the renal arteries (the vessels that take blood to the kidneys) and just above the iliac arteries (the vessels that take blood to the legs).

The diameter of a normal aorta below the renal arteries measures about 2.3 cm (1 inch) in men and 1.9 cm (3/4 inch) in women. An aorta is considered aneurysmal when it grows more than 50% greater than its normal size.¹

An AAA usually develops slowly and gradually. The process may take several years and is often undetected due to an AAA's characteristic lack of symptoms.

Who is at risk?

The enlargement of an abdominal aortic aneurysm results from a weakening in the aortic wall, which may have a variety of causes. Although researchers have not identified a direct cause of weakening aortic walls, several risk factors can lead to the formation of an AAA. These include the following:

- atherosclerosis, or hardening of the arteries
- cigarette smoking
- high blood pressure
- genetics
- infection or trauma

“No one really knows how an AAA forms,” says Gregg Londrey, MD, Virginia Surgical Associates, Richmond, Va. “We blame atherosclerosis, but many people have atherosclerosis and don’t have aneurysms. Certainly, genetics is involved. Yet, a specific gene

has not been identified. Still, the most important risk factors are atherosclerosis and family history.”

Abdominal aortic aneurysms can affect anyone, but they are found most frequently in Caucasian men and are uncommon in people of African American, Asian or Hispanic descent. Abdominal aortic aneurysms are most often seen in men 40 to 70 years old.² According to one study, the incidence of AAA has increased threefold over the past 40 years.³ This increase may be due to the aging of the general population.³

What are the risk factors?

The biggest danger to the patient with an abdominal aortic aneurysm is aneurysm rupture. Rupture is life-threatening, because it results in excessive internal bleeding. Rupture leads to death in more than 85% of patients,⁴ and is the 10th leading cause of death in the United States.⁵ Approximately 1 in every 250 people over the age of 50 will die of a ruptured AAA.³ With early diagnosis and timely intervention, death from aneurysm rupture is preventable.

Yet, not every AAA will continue to enlarge and eventually rupture. Rupture of an AAA depends on its size. The risk that a small aneurysm (less than 5 cms, or 2 inches) will rupture is low.² With small, asymptomatic AAAs, the physician may continue to observe the aneurysm growth with imaging studies approximately every 6 months.

“It is not uncommon to follow a small aneurysm every 6–12 months,” says Londrey. “They can stay the same size for a long time. Yet, the younger the patient, the more persuasive the argument is to fix it.”

If surgical repair is performed before the aorta ruptures, the outcome is usually favorable. The rupture rate of

AAAs that measure less than 5 cm ranges from 0% to 1% per year, to as high as 6% per year.⁶

The larger an aneurysm grows, the greater the chance it will rupture. Most physicians recommend treatment of an AAA at 5 cms or larger.³ Rupture risk for AAAs measuring 6.5 cm and 7.5 cm is 9% and 12.5% per year.⁶

Aortic dissection occurs when blood leaks from an artery with a torn wall. A dissected aneurysm is at even greater risk of rupture.

Whether an aneurysm is large or small, once it is diagnosed, the patient would benefit from changing negative lifestyle habits to positive habits—stopping smoking, increasing exercise, controlling blood pressure and eating healthy foods.

What are the symptoms?

Thomas Terramani, MD, Vascular Surgery Fellow, Department of Surgery, Division of Vascular Surgery, Emory University School of Medicine, Atlanta, Ga, reports that 75% of patients with abdominal aortic aneurysm have no symptoms.⁵ However, some patients present with symptoms that include chronic pain in the lower back or abdomen, or an abnormal pulsating feeling in the abdomen.

More severe symptoms usually indicate the AAA has ruptured. Symptoms of rupture can include the following:

- sudden, severe back or groin pain
- severe abdominal ache
- paleness
- rapid pulse
- dry mouth and skin and excessive thirst
- anxiety

- nausea and vomiting
- lightheadedness or fainting
- excessive sweating or clammy skin

“Patients always want to know how they’ll know if their AAA ruptures,” says Londrey. Most AAAs that have not ruptured and are not leaking, he says, are also not symptomatic.

“The size of the aneurysm determines the urgency of the situation,” says Londrey. “If you see a 7 cm aneurysm on a patient report, that information needs to be moved along very quickly.”

How is AAA diagnosed?

Because most patients with an abdominal aortic aneurysm do not have symptoms, AAAs are usually found on a routine examination or an examination for another medical problem.

Since aneurysms can run in families, reviewing the patient’s medical history before the examination is key. During the physical examination, the physician may palpate the abdomen and ask the patient if they’ve experienced low back pain or tenderness in the stomach area below the ribs. The physician may also detect an AAA by listening to the abdominal area with a stethoscope. If an AAA is present, the physician may hear a murmur over the aorta—a “whooshing” sound, called a bruit.⁷ The AAA may also be felt as a mass that pulsates with each heartbeat.

Physical examination alone is not enough to determine the presence of an AAA, so the physician will order other diagnostic tests. Commonly used imaging techniques to determine an AAA include computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound.

According to Terramani, ultrasound is an excellent screening tool for

accurate evaluation and measurement of an AAA. Computed tomography also provides accurate measurements and can give a three-dimensional image of the AAA. Terramani says that although MRI may be more costly and not as accessible to the patient as CT, it avoids exposing the patient to radiation and contrast dyes that can be toxic to the kidneys.

Less frequently, the physician may order arteriography before surgery to repair an AAA to determine if the patient has any blockages in the arteries. Finally, a complete blood count (CBC) may indicate blood loss if an AAA is leaking or has ruptured.

What are the treatment options?

The physician and patient must consider several factors when deciding how best to treat the abdominal aortic aneurysm. Generally, the physician and patient must weigh the risk of surgery against the chance that the abdominal aortic aneurysm will burst. At this stage, it is crucial for the patient to receive as much information as possible about treatment options.

A physician may repair an AAA through traditional open surgery, or by using a new technique called endovascular stent graft placement. In either case, the goal is to safely route blood past the AAA, which causes it to shrink over a period of time.

Traditional open surgery

Until a few years ago, physicians used only traditional open surgery to repair an abdominal aortic aneurysm. In this procedure, which requires general anesthesia, the surgeon opens the abdomen with an incision from the patient’s breastbone to the pubic area.

Once the surgeon finds the AAA, he replaces the defective section of the

aorta with a polyester cloth graft. The graft replaces the aneurysmal or enlarged aorta and allows the blood to continue to flow into the arteries in the legs. Once the graft is in place, the abdominal wall is closed and the incision is secured with sutures or staples. The patient may be in the hospital for 7 to 10 days and face a recovery period of 4 to 6 weeks.

In open surgery, the AAA is permanently eliminated, because it is entirely replaced by a prosthetic aortic graft, and the risk of AAA recurrence or rupture no longer exists. In addition, long-term followup is not necessary. However, open surgery is risky for elderly patients and those suffering from other medical problems, such as pulmonary disease, heart disease, high blood pressure, or diabetes.

Endovascular stent graft placement

In September 1999, the Food and Drug Administration approved 2 stent graft devices, which are grafts held in place by stents, for endovascular repair. With the endovascular procedure, opening the abdomen is not required. The repair is made from inside the aorta.

In this procedure, the surgeon inserts a catheter through a groin artery into the abdominal aorta while viewing the procedure on a monitor. At the tip of the catheter are a deflated balloon and a tightly wrapped polyester cloth graft. The surgeon secures the graft in place by inflating the balloon. Once the graft is in place, the surgeon deflates the balloon and removes it and the catheter. Hooks, pins, or stents anchor the graft to the inside of the artery.

Endovascular stent graft placement has advantages over open surgery. The procedure is less invasive

and less painful, results in less blood loss, and requires only local or epidural anesthesia. The patient's hospital stay is only 1 to 3 days, and recovery is expected within 1 to 2 weeks.

"The endograft procedure is most suited for patients who can least tolerate an open surgery," says Londrey.

Therefore, patients with severe chronic obstructive pulmonary disease, such as emphysema and heart disease could benefit most from the procedure.

Also, gastrointestinal complications, common after open surgery, are reduced because the abdominal cavity is not opened. According to Terramani, if long-term results of clinical trials of the endovascular repair procedure remain favorable, it may become the treatment of choice for many patients with an abdominal aortic aneurysm.

However, the downside of the endovascular repair must be considered. The most common problem is *endoleak*, or blood leaking from the repair. This complication was present in 19.5% of patients at 1 month post-procedure, and 14.4% at 1 year.⁵ Also, the endograft procedure requires frequent followup to ensure that the graft does not leak, migrate, or rupture. Patients are required to undergo imaging studies every 6 months to a year, for the rest of their lives.

CMA's can be helpful to these patients by tracking their progress postsurgery and reminding them to make appointments for their periodic imaging studies, says Joyce Hardee, CMA-A, of Virginia Surgical Associates in Richmond, Va.

Which procedure is best?

Although endovascular repair has been praised for its less invasive nature, Terramani says it is not for everyone. Patients must understand the advan-

tages and disadvantages of each procedure before making an informed decision with their physician.

"Stent graft repair is not the magic bullet that treats all aneurysms," says Terramani. "Many patients don't hear about endograft failure, graft migration, occlusion, and endoleaks. At least 20% of patients who have had an endograft have to return for subsequent procedures to fix a problem."

Londrey agrees. "If a patient is a candidate for both procedures, the younger and healthier they are, the more I would talk to them about having the open repair," he says. "Endograft repair doesn't come with a lifetime guarantee that the graft will remain in place. If the patient's anatomy changes, the endograft can move, and blood can flow back into an aneurysm. That's why it's necessary to follow an endograft."

In addition, says Terramani, "The patient has to have the right anatomy."

"Many women cannot have the endograft repair because their aortas are smaller," notes Hardee.

Patients who elect to have the stent graft repair also must be willing to participate in lifetime followup.

"Patients who have open surgery are not required to follow up with their doctor as much as those who have had the endovascular procedure," says Terramani. "After traditional surgery, the patient may have postsurgical imaging studies at 6 months and again at a year, but then they're done. Patients who have the endograft repair can expect to have at least annual imaging studies for the rest of their lives.

"The endograft procedure is still evolving," says Terramani. "The open surgery may be more costly up front and is a greater stressor to the body, but right now, it's a proven remedy for AAA."

Having an abdominal aortic aneurysm can be serious, but does not necessarily mean certain death. By having a thorough understanding of how AAAs form, how they grow and what procedures are used to treat them, CMA's can help patients who develop an AAA learn more about their disease and make good decisions about their treatment options. ▀

References

1. Guidant Corporation. What is an abdominal aortic aneurysm? Available at: <http://www.guidant.com/webapp/emarketing/compass/comp.jsp?lev1=aaa&lev2=what>. Accessed July 8, 2003.
2. MEDLINEplus Health Information. Abdominal aortic aneurysm. Available at: <http://www.nlm.nih.gov/medlineplus/ency/article/000162.htm>. Accessed April 2, 2003.
3. Society of Interventional Radiology. Stent graft repair of abdominal aortic aneurysms. Available at: <http://www.sirweb.org/patPub/abdominalAorticAneurysms.shtml>. Accessed April 2, 2003.
4. Endovascular Center. Abdominal aortic aneurysm. Available at: <http://www.endovascularone.com/aaa.htm>. Accessed July 7, 2003.
5. Terramani TT, Najibi S, Lumsden AB, and Lin PH. New approaches to abdominal aortic aneurysm. *Emerg Med* [serial online]. 2002;22-28.
6. Brown LC, Powell JT. Risk factors for aneurysm rupture in patients kept under ultrasound surveillance. The UK Small Aneurysm Trial Participants. *Ann Surg*. September 1999;230:289-97.
7. Yahoo! Health. Abdominal aortic aneurysm. Available at: <http://health.yahoo.com/health/encyclopedia/000162/0.html>. Accessed July 9, 2003.

Susan O'Leary is a writer who specializes in medical and health care topics. Her work includes patient education materials, newsletter articles, and website content for hospitals and health care systems across the country.