

AORTIC ANEURYSMS
ENDOVASCULAR REPAIR USING
FENESTRATED & BRANCHED
ENDOGRAFTS



My Drift

Title: Aortic Aneurysms

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A friend and reader of my articles requested that I write about Aortic Aneurysms and the new treatment available using multiple fenestrated stents and branched endografts. This person thinks that this treatment saved his/her life. I have agreed to keep this person's detailed personal information confidential. This person also thinks that my excellent documentaries, that are read by people all around the United States and a few other countries, can save lives.

I hope so!!

Some Shocking Facts

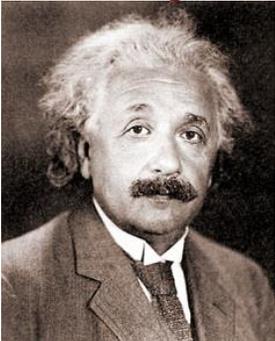
Each year more than 200,000 people in the U.S. are diagnosed with abdominal aortic aneurysms. Because many do not experience symptoms, it's estimated that more than one million people in the U.S. are living with an undiagnosed abdominal aortic aneurysm.

Screening studies show that abdominal aortic aneurysms occur in about 10 percent of men and 6 percent of women over the age of 65.

Fortunately, about 95 percent of these aneurysms can be successfully treated if detected prior to rupture. Finding and treating an aortic aneurysm before the aneurysm ruptures is vital for patient survival.

More than 15,000 people a year die from ruptured aneurysms, with the incidence of aortic aneurysms tripling in the United States in the past 30 years, attributed to an aging population. Abdominal aortic aneurysms are the third leading cause of sudden death in men over age 60.

Famous People Who Died of Aortic Aneurysm (Raptured Aortic or Aortic Dissection)



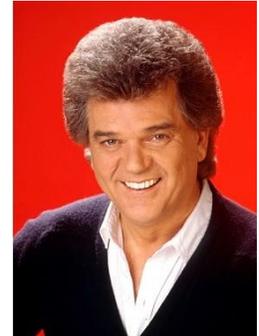
Albert Einstein
(Theoretical Physicist)



Lucille Ball
(I Love Lucy)



George C. Scott
(Movie Actor)



Conway Twitty
(Country Music Singer)



John Ritter
(Sitcom Comic Actor)



Flo Hyman
(Olympic Volleyball)



Alan Thicke
(Growing Pains)



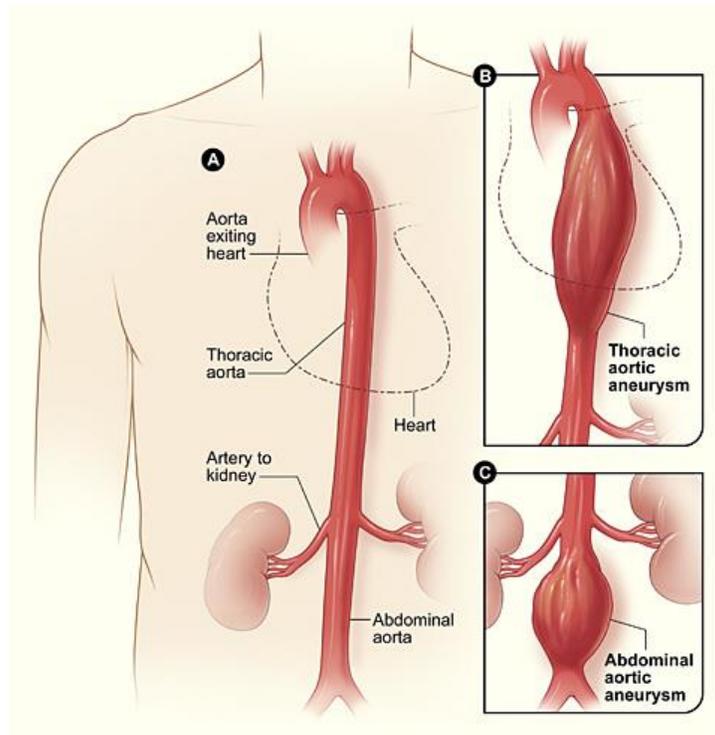
Marilyn Chambers
(Porn Movie Star)

So, what is an Aortic Aneurysm?

Aneurysms are a ballooning and weakening of the arterial wall and can occur in almost any artery in the body. If an aneurysm grows large enough it may lead to rupture, internal bleeding, shock, and death.

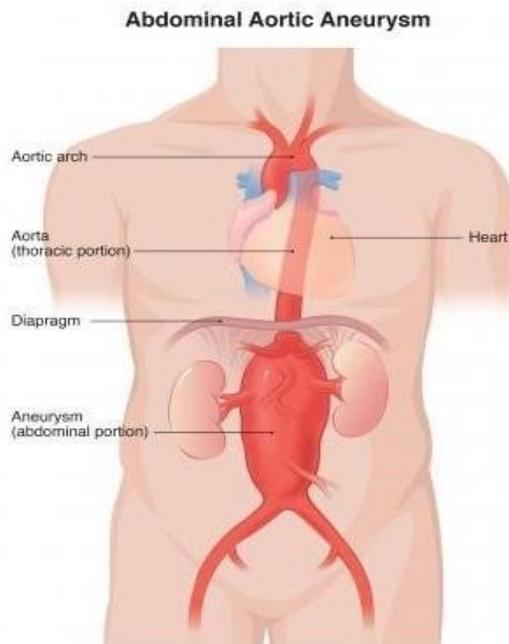
Common types of aneurysms

Aortic aneurysms occur in the aorta, which delivers blood throughout the body from the heart to your organs. Thoracic aneurysms occur in the section of the aorta located in the chest, while abdominal aneurysms can occur in any section of the abdomen, including the intestines and kidneys.



Normal Aortic

This article will be mostly about abdominal aneurysms and the new treatment available.

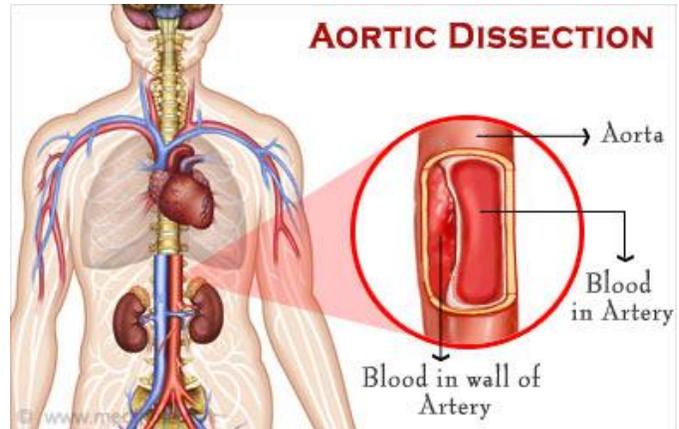


The majority of aortic aneurysms are abdominal aortic aneurysms. While small abdominal aortic aneurysms rarely rupture, they can grow very large without causing symptoms.

The typical size of an abdominal aorta is 2 to 3 centimeters (about 1 inch): about the size of a quarter. An enlarged abdominal aorta is typically greater than 3 centimeters. All patients with an enlarged aorta who do not meet surgical criteria need regular surveillance and monitoring. This may include testing by CT scan or ultrasound imaging.

Aortic Dissection

An aortic dissection begins when a tear forms in the innermost lining of the aortic wall. When the tear occurs, blood leaks into the aortic wall, causing separation of its layers. This leads to intense pressure in the aortic wall and a high risk of rupture. Aortic dissections may also limit the flow to several important organs including the heart, brain, liver, kidneys, intestines, spinal cord, and legs. Aortic dissection is a life-threatening emergency and is frequently fatal.



At this time, no one knows for sure how aneurysms develop or progress. People who have aortic aneurysms are at higher risk of aortic dissection based on the size, the patient's medical condition, and heredity. This weakens the aorta and may cause it to rupture.

Risk Factors

Risk factors for an aortic aneurysm may include:

- Age
- Gender
- Smoking
- High blood pressure
- Connective tissue disorders
- A family history of aortic aneurysms

Symptoms

Aneurysms are often called a “silent killer,” because patients often have no symptoms until the aneurysm bursts. Nearly 75 percent of all patients with a ruptured aneurysm die from the condition, which makes screening crucial for people at greatest risk.

Abdominal aortic aneurysms are usually caused by atherosclerosis (hardened arteries), but infection or injury can also cause them. Abdominal aortic aneurysms often don't have any symptoms. If an individual does have symptoms, they can include

- Throbbing or deep pain in your back or side
- Pain in the buttocks, groin, or legs
- A pulsating feeling near the navel

Diagnosis

Abdominal aortic aneurysms are often found during an examination for another reason. For example, during a routine exam, your doctor may feel a pulsating bulge in your abdomen, though it's unlikely your doctor will be able to hear signs of an aneurysm through a stethoscope. Aortic aneurysms are also often found during routine medical tests, such as a chest X-ray or ultrasound of the heart or abdomen, sometimes ordered for a different reason.

To diagnose an abdominal aortic aneurysm, doctors will review your medical and family history and conduct a **physical examination**. If your doctor suspects that you have an aortic aneurysm, specialized tests can confirm it. These tests might include:

Abdominal ultrasound. This test is most commonly used to diagnose abdominal aortic aneurysms. During this painless exam, you lie on your back on an examination table and a small amount of warm gel is applied to your abdomen. The gel helps eliminate the formation of air pockets between your body and the instrument the technician uses to see your aorta, called a transducer. The technician presses the transducer against your skin over your abdomen, moving from one area to another. The transducer sends images to a computer screen that the technician monitors to check for a potential aneurysm.

Computerized tomography (CT) scan. This painless test can provide your doctor with clear images of your aorta, and it can detect the size and shape of an aneurysm. During a CT scan, you lie on a table inside a doughnut-shaped machine. CT scanning generates X-rays to produce cross-sectional images of your body. Doctors may inject a dye into your blood vessels that helps your arteries to be more visible on the CT pictures (CT angiography).

Magnetic resonance imaging (MRI). An MRI is a painless imaging test that may be used to diagnose an aneurysm and determine its size and location. In this test, you lie on a movable table that slides into a tunnel. An MRI uses a magnetic field and pulses of radio wave energy to make pictures of your body. Doctors may inject a dye into your blood vessels to help your blood vessels to be more visible on images (magnetic resonance angiography).

Regular screening for people at risk of abdominal aortic aneurysms. The U.S. Preventive Services Task Force recommends that men ages 65 to 75 who have ever smoked should have a one-time screening for abdominal aortic aneurysms using abdominal ultrasound. Men ages 60 and older with a family history of abdominal aortic aneurysms should consider regular screening for the condition.

There isn't enough evidence to determine whether women ages 65 to 75 who have ever smoked cigarettes or have a family history of abdominal aortic aneurysms would benefit from abdominal aortic aneurysm screening. Ask your doctor if you need to have an ultrasound screening based on your risk factors. Women who have never smoked generally don't need to be screened for the condition.

Treatment for Aortic Aneurysm

The goal of treatment is to prevent your aneurysm from rupturing. Generally, your treatment options are medical monitoring or surgery. Your doctor's decision depends on the size of the aortic aneurysm and how fast it's growing.

Medical monitoring

If your abdominal aortic aneurysm is small and you're not experiencing symptoms, your doctor may recommend medical monitoring, which includes regular appointments to make sure your aneurysm isn't growing, and management of other medical conditions that could worsen your aneurysm. Your doctor will also ask you about any signs or symptoms you may be experiencing that could be related to the aneurysm.

It's likely your doctor will order regular imaging tests to check on the size of your aneurysm. Expect to have an abdominal ultrasound at least six months after your aneurysm is diagnosed and at regular follow-up exams after the first imaging test. The frequency of your imaging tests depends on the size of the aneurysm, whether the aneurysm is growing and how fast it's growing.

Surgery

If you have an abdominal aortic aneurysm, surgery is generally recommended if your aneurysm is about 1.9 to 2.2 inches (about 5 to 5.5 centimeters) or larger. Doctors may also recommend surgery if the aneurysm is growing quickly. In addition, your doctor may recommend treatment if you're experiencing symptoms such as stomach pain or you have a leaking, tender or painful aneurysm.

Surgery options may include:

Open abdominal surgery. Open abdominal surgery to repair an abdominal aortic aneurysm involves removing the damaged section of the aorta and replacing it with a synthetic tube (graft), which is sewn into place.

This procedure requires open abdominal surgery, and it will generally take you a month or more to fully recover.

Endovascular surgery. Endovascular surgery is a less invasive procedure used more frequently today to repair an aneurysm. Doctors attach a synthetic graft to the end of a thin tube (catheter) that's inserted through an artery in your leg and threaded up into your aorta. The graft — a woven tube covered by a metal mesh support — is placed at the site of the aneurysm and expanded. The graft is fastened in place with the metal mesh that frequently has small hooks or pins. The graft reinforces the weakened section of the aorta to prevent rupture of the aneurysm.

Recovery time is generally much shorter with this procedure than with open abdominal surgery, but endovascular surgery can't be done in about 30 percent of people with an aneurysm. Discuss with your doctor whether you're a candidate for this procedure. After endovascular surgery, you'll need to have regular follow-up imaging tests to ensure that the graft isn't leaking. Long-term survival rates are similar for both endovascular surgery and open surgery.

The options for treatment of your aneurysm will depend on a variety of factors, including location and size of the aneurysm, your age, and other existing conditions that may increase your risk of surgery or endovascular repair. Your doctor will discuss with you the most appropriate treatment for you.

**THERE IS NOW (SINCE 2014) A NEW TREATMENT OPTION
IT IS CALLED A FENESTRATED STENT ENDOGRAFT**

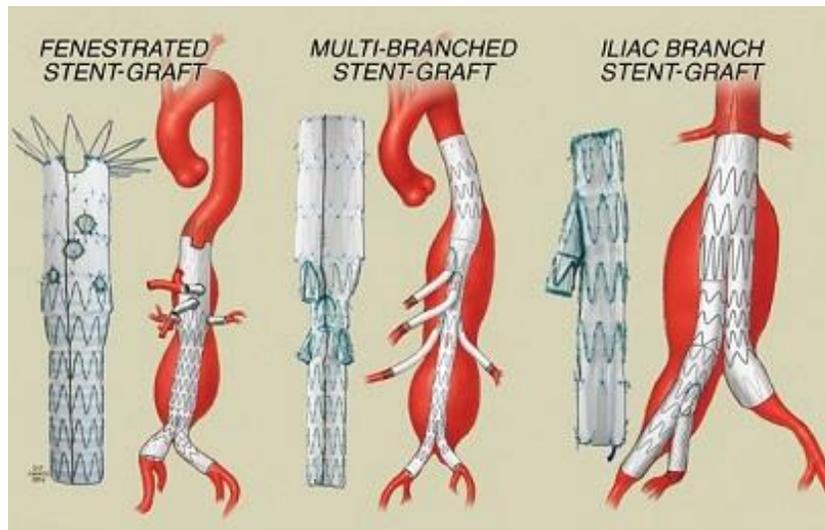
The Fenestrated Stent Endograft is a relatively new minimally-invasive option for people with abdominal aortic aneurysms who don't qualify for traditional endovascular aneurysm repair (EVAR). Traditional EVAR works when aneurysms are located far enough from the renal (kidney) arteries, which branch off the aorta, that the stent can be securely attached to the aorta.

But for about 10 percent of patients with an abdominal aortic aneurysm, the aneurysm is too close to the arteries that branch off to the kidneys for traditional EVAR to work. The location of this aneurysm is complicated to treat and often requires open surgery to repair the weakened wall.

Until recently, the only option these patients had was major abdominal surgery or no surgery at all. The no surgery option usually resulted in death.

The unique feature of fenestrated endografts is that they can cover branch arteries of the aorta (such as the renal arteries) because the graft has fenestrations, or holes, that

correspond to the position of the branching arteries within the aorta to allow for blood to flow through the graft into the branch vessel.



The fenestrated endograft is inserted into the femoral artery via an incision in the groin percutaneously, or through the skin. It is then guided through the blood vessel to the aneurysm.

The fenestration holes are then positioned over the openings of the branch vessels such as the renal arteries so that the blood flow continues to these vital vessels while the graft is secured in place.

Once the fenestrated endograft is implanted inside the aneurysm, blood can now flow through the diseased area without putting pressure on the aneurysm, as well as allow blood to flow to other branch vessel organs such as the kidneys.

Fenestrated stent endografts offer a number of benefits over open surgery, including shorter hospital stays, fewer complications and risks, and faster recovery times.

THERE ARE CURRENTLY ONLY 13 HOSPITALS IN THE U.S. THAT OFFER THIS TYPE OF TREATMENT (NONE ARE IN HAWAII)

Here is a partial list of the hospitals:

- Johns Hopkins Hospital
- Cleveland Clinic
- Abbott Northwest Hospital
- Mayo Clinic
- UNC Medical Center
- Barnes-Jewish Hospital
- Emory Healthcare
- Stanford Medical Center

Summary

(The following paragraphs take you through a typical fenestrated stent endograft procedure. There will be differences depending on the hospital and your vascular surgeon)

1 What is an Abdominal Aortic Aneurysm?

The main artery (aorta) in your tummy (abdomen) has stretched and weakened causing it to bulge. This bulge is called an aneurysm. Aneurysms are most commonly a result of the accumulation of fatty deposits on the vessel wall but can also be related to trauma or they can be hereditary.

2 Why have you been offered this operation?

Over time, the pressure of blood can cause the aneurysm to grow and expand. If it grows beyond 5.5cm in diameter it may need treatment to prevent it from bursting.

3 What does the operation involve?

Your doctor has decided that your aneurysm may be suitable to be treated by keyhole (endovascular) surgery. This is a relatively new method of treatment which is a less invasive and a less disruptive operation. The long-term outcomes of this surgery are not yet known. Fenestrated grafts were introduced into clinical practice in 2014. Fenestrated stents allow patients to have surgery even if they are unsuitable for standard endovascular aneurysm repair (EVAR) and are considered very high risk for open repair. The design of these stents preserves the blood supply to organs including the kidneys and bowels. Each stent graft is tailor-made for an individual patient. The operation is carried out through two small incisions (cuts) in the groins. A stent graft, which is a woven polyester tube covered by a tubular metal framework, is placed inside the aneurysm. It is put into place using guide wires and inflation balloons. Once in place, the stent graft excludes the aneurysm (the bulge) and provides a new pathway for blood to flow through, thereby reducing the risk of rupture.

4 What are the risks?

Your consultant or vascular surgeon will have discussed the operation fully with you, including the risks involved in this type of surgery. These include:

Blood clots leading to circulatory problems. Sometimes a blood clot can become dislodged during the procedure. This can lead to the disruption of the circulation to the legs which may require further surgery. In some cases, you may be left with leg/buttock pain on walking. This may improve over a period of months but may be permanent. During the course of your elective aneurysm repair, the blood supply to

your kidneys and bowel may fall below normal levels. This is because the arteries supplying blood to the kidneys and bowel lie very close to the aneurysm. For most patients, this is a temporary event, causing no long-term problems. Very rarely, however, the fall in blood supply may be sufficient enough to require you to need post-operative dialysis (to support your kidneys) or further surgery (which could include removal of a segment of bowel). Please be assured that these are very rare problems following elective aneurysm surgery and your surgical and nursing team will do everything possible to avoid this from happening.

Wound infection. All operations carry a small risk of infection. The antibiotics you are given during your operation prevent most infections. Unfortunately, there are some infections (such as Methicillin-resistant Staphylococcus aureus (MRSA)) that affect patients in hospitals and these can be very difficult to treat with antibiotics. Very occasionally these infections can involve the plastic graft that is put into the artery to repair it.

Leakage around the graft (Endoleak). Occasionally, the stent graft may slip from its position, allowing blood flow around the stent graft and into the aneurysm. Some of these leaks will seal spontaneously. Others may require further treatment.

Sexual dysfunction. Some patients experience reduced sensations, men may experience absent ejaculation or poor erection following this procedure.

Conversion to open repair. Rarely, there can be technical difficulties which may require that your surgery is converted to an open repair. This the traditional way of repairing aneurysms and would involve a cut across the abdomen to repair the aneurysm.

5 Before your operation

You will be asked to attend a hospital clinic for a pre-admission assessment about two weeks before your operation, to have the tests required to ensure that you are fit for your surgery. These tests will include blood tests, X-rays, and an ECG. It will also be necessary to take some swabs (using a cotton bud) from your nose and skin to identify any existing MRSA (staph) infection before your operation.

In order to reduce the risk of MRSA, all patients, regardless of their MRSA status, will be given an antibacterial nasal cream and a shower gel to wash with. This appointment could take up to half a day. Please bring all your current medications with you. You may also be asked to attend the hospital for an anesthetic assessment.

6 Coming into hospital

You will receive a letter telling you which hospital and which ward you will be admitted to. Please bring with you all the medicines you are currently taking. You will usually be admitted to the ward the day before your operation. On admission, one of the nurses will check your personal details and give you an identity wristband. The surgeon who will be performing the operation and the anesthetist will visit you. IF YOU ARE ON ASPIRIN DO NOT STOP TAKING YOUR USUAL DOSE.

7 What should I bring in with me?

You should bring:

- **All your usual medication**
- **Nightwear and slippers**
- **Toiletries**
- **Towel**
- **A small amount of money.**

Whatever you bring into hospital with you is your responsibility and the trust accepts no responsibility for any items lost or broken during your stay.

8 No Smoking Policy

Smoking is not allowed in any hospital building. There are smoking shelters for patients and visitors outside the hospital and staff will be able to direct you to the nearest one.

9 Mobile phones

The use of mobile phones is restricted in some areas. Please check with the nurse in charge before you use your phone.

10 Ward visiting times

Please check with the ward you are admitted to about visiting times.

11 The operation

You will be prepared and escorted to the anesthetic room where you will be given your anesthetic and then into operating room. While you are asleep tubes will be inserted:

- **into your bladder to drain your urine**
- **into your neck for blood pressure measurements and administration of fluids**

12 After the operation

You may be nursed in one of the high dependency areas for a short while before returning to the ward. You will be given all the fluids that you need via a drip, until you are able to take fluids by mouth again. The nurses and doctors will try to keep you free from pain by giving painkillers either by injection or by a machine which you are able to control yourself by pressing a button. Once you are able to drink, painkillers will be given by mouth. Once your condition is stable, you will return to the ward. In the following days and as you improve, the various tubes will be removed. The physiotherapist will visit you before and after your operation. They will help you with breathing exercises to prevent you developing a chest infection. They will also assist with your mobility.

13 Going home

Wounds.

Your stitches or staples will either dissolve or be removed, usually 10 to 14 days after your operation. If you still have stitches when you go home, your ward nurse will arrange for a district nurse to remove them at home. It is quite normal to have some bruising. If you have increasing redness, swelling or discharge from the wound, you should contact your doctor for advice.

Discomfort.

It is quite normal to experience discomfort and itching around your wound site as part of the healing process. You will usually be given a supply of painkillers to take home with you. If this is not effective, then contact your doctor.

Diet.

After you are discharged, you should be able to eat normally, but lightly for the first week or two. There is no reason why you should not enjoy a moderate intake of alcohol, unless it affects any medication you are taking.

Bathing.

Once your wound is dry you can bathe or shower as normal.

Driving.

You will be safe to drive when you can perform an emergency stop without causing you any pain. This will normally be at least four weeks after your surgery but if in doubt check with your doctor.

Exercise.

Getting back to your normal lifestyle will be a gradual process. If you feel tired, then rest. Your strength will return and you will eventually make a full recovery from the operation, but it may take 3 to 6 months.

Sex.

You may resume sexual activity when your wounds are fully healed. This usually takes about four to six weeks. If you have any concerns, please contact your doctor.

Work.

If you work, you should be able to return to work within about one to three months of your operation. The time you need away from work will depend on the job you do. If you need a sick note, please ask for one before you go home.

14 Outpatients follow up

This procedure requires lifelong follow up. Initially, you will be given an outpatient appointment for 1 month after you are discharged. It will then be necessary to see you at 3, 6 and 12 monthly intervals. These appointments will involve an ultrasound scan at your clinic visit. You will then be monitored annually, when in addition to the scan you will have blood tests, an x-ray, and a CT scan. If at any time after discharge, you are concerned about any symptom or problem you should contact your doctor.

15 Important information

As with Cardiac Surgery, information about adverse outcomes following Vascular Surgical operations (e.g. deaths/major complications) are submitted to a national database in order to ensure that hospitals are providing safe and effective care and that we (as a Unit) are accountable to our patients and also comply with National Quality Standards.

If you undergo an operation to repair your aortic aneurysm, the hospital would normally submit data relating to your operation to this database. Any data submitted about your operation is maintained in a secure computerized database.

Bottomline

If you have an abdominal aortic aneurysm and your vascular doctor is recommending open abdominal surgery, you might want to look into this new fenestrated stent endograft treatment option. There are a lot of abdominal aortic aneurysm patients and some vascular doctors who are not aware of this new advanced treatment.

People 65 and over should get a simple abdominal aortic aneurysm exam as part of a yearly physical. A good doctor can feel it easily providing it is part of the physical and the doctor is checking to make sure you don't have an abdominal aortic aneurysm.

Please let me know if this article saves your life.

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