Abdominal Aortic Aneurysm

An aneurysm is a bulge in a blood vessel caused by a weakness in the blood vessel wall. As blood passes through the weakened blood vessel, the blood pressure causes it to bulge outwards like a balloon.

Exactly what causes the blood vessel wall to weaken is unclear, though hardening of the arteries, smoking and high blood pressure are thought to increase the risk of an aneurysm.

Aneurysms can occur anywhere in the body, but the two most common places for them to form are in the abdominal aorta and the brain.

This topic is about abdominal aortic aneurysms.

The abdominal aorta

The abdominal aorta is the largest blood vessel in the body. It is roughly the width of a garden hose. It transports oxygen-rich blood away from the heart to the rest of the body.

It runs in a straight line down from the heart, through the chest and abdomen before branching off into a network of smaller blood vessels.

In most cases, an abdominal aortic aneurysm causes no noticeable symptoms and does not pose a serious threat to health.

However, there's a risk that a larger aneurysm could burst open (rupture). A ruptured abdominal aortic aneurysm can cause massive internal bleeding, which is usually fatal. Four out of five people with a ruptured aortic aneurysm will die as a result.

The most common symptom of a ruptured aortic aneurysm is sudden and severe pain in the abdomen.

If you suspect that you or someone else has had a ruptured aneurysm, call the hospital immediately and ask for an ambulance.

Treatment

The aim of treatment is to prevent the aneurysm from rupturing. This is usually done with surgery to replace the weakened section of the blood vessel with a piece of synthetic tubing.

However, preventative surgery carries a small risk of causing serious complications. It's usually only recommended if it's thought that the risk of a rupture is high enough to justify the risk of surgery.

The size of the aneurysm is often used to measure the risk of it rupturing. Preventative surgery is often recommended for an abdominal aortic aneurysm that's larger than 5.5cm.

A number of non-surgical treatments can also be used to reduce the risk of an aneurysm rupturing. They include a type of medication known as a statin, or quitting smoking if you smoke.

Screening

In India, we do not have any screening yet. However, we can arrange this for you.

You can ask your doctor to refer you for screening if you or they feel that you have an increased risk of having an aortic aneurysm. For example, this might be the case if you're over 65 and are a heavy smoker.

Who is affected?

Abdominal aortic aneurysms are most common in men aged over 65, with around in 1 in 25 men being affected.

Prevention

The best way to prevent getting an aneurysm, or reduce the risk of an aneurysm growing bigger and possibly rupturing, is to avoid any activities that could damage your blood vessels, such as:

- smoking
- eating a high-fat diet
- not exercising regularly
- being overweight or obese

Read more about preventing aneurysms.

Symptoms of an abdominal aortic aneurysm

In most cases, an unruptured abdominal aortic aneurysm will cause no symptoms, unless it becomes particularly large.

Symptoms of an unruptured abdominal aortic aneurysm may include:

- a vibrating feeling in your abdomen, usually near your belly button, that's usually only noticeable when you touch it
- persistent back pain
- persistent abdominal pain

Ruptured aortic aneurysm

If your aortic aneurysm ruptures, you'll feel a sudden and severe pain in the middle or side of your abdomen. In men, the pain can also radiate down into the scrotum.

Other symptoms include:

- dizziness

- sweaty and clammy skin
- rapid heartbeat (tachycardia)
- shortness of breath
- feeling faint
- loss of consciousness

Medical emergency

A ruptured aortic aneurysm is a medical emergency. If you suspect that you or someone in your care has had a ruptured aneurysm, call the hospital immediately and ask for an ambulance.

Causes of an abdominal aortic aneurysm

Atherosclerosis

Atherosclerosis is a thickening of the walls of the arteries.

The aorta is the largest blood vessel in the body. It transports oxygen-rich blood away from the heart to the rest of the body.

The aorta is a hollow tube, about the width of a hosepipe. The wall of the aorta is made up of elastic fibres.

An aortic aneurysm occurs when part of the aortic wall becomes weakened.

The large amount of blood that passes through the aorta puts pressure on the weak spot in the wall, causing it to bulge outwards to form an aneurysm.

Risk factors for an aortic aneurysm

It's not known exactly what causes the aortic wall to weaken. However, several factors, many of which are related, have been linked to an increased risk of developing an abdominal aortic aneurysm. These are described below.

Smoking

Probably the most important risk factor for aortic aneurysm is smoking. Research has found that smokers are seven times more likely to develop an aortic aneurysm than people who have never smoked.

The amount that you smoke increases the risk. People who regularly smoke more than 20 cigarettes a day may have more than 10 times the risk of non-smokers.

The risk may increase because smoking can cause hardening and narrowing of the arteries (atherosclerosis), and there may be harmful substances in tobacco smoke that could damage the walls of the aorta.

Atherosclerosis

Atherosclerosis is a potentially serious condition where arteries become clogged up by fatty substances, such as cholesterol. This leads to the arteries becoming narrowed and hardened.

Smoking, eating a high-fat diet and high blood pressure all increase your risk of developing atherosclerosis.

High blood pressure

As well as contributing to atherosclerosis, high blood pressure can place increased pressure on the wall of the aorta.

Age and sex

The older you are, the more likely you are to develop an abdominal aortic aneurysm.

One study found that people aged over 75 are seven times more likely to be diagnosed with an aortic aneurysm than people under 55 years old.

Aortic aneurysms are also more common in men than women. Men are five times more likely to be diagnosed with an abdominal aortic aneurysm than women.

Family history

Having a family history of aortic aneurysms means that you have an increased risk of developing one.

One study found that people who had a brother or sister with an aortic aneurysm were eight times more likely to develop one than people whose siblings were unaffected.

This suggests that certain genes you inherit from your parents may make you more vulnerable to developing an aortic aneurysm. However, no specific genes have been identified yet.

Diagnosing an abdominal aortic aneurysm

Abdominal aortic aneurysms are often diagnosed during a routine physical examination when a doctor notices the distinctive vibrating sensation in the abdomen.

A diagnosis can be confirmed using an ultrasound scan. Ultrasounds can also determine the size of the aneurysm, which is an important factor in deciding on a course of treatment.

Treating an abdominal aortic aneurysm

There are two main types of treatment for an aneurysm:

- **preventative treatment**, where an aneurysm is treated to prevent it from rupturing
- **emergency treatment**, where an aneurysm is repaired after it ruptures

The main preventative treatment is surgery. As with any type of surgery, it carries a risk of complications, some of which are serious.

Therefore, preventative surgery is usually only recommended if it's thought that the risk of a rupture is high enough to justify the risk of surgery.

Preventative treatment for abdominal aortic aneurysm

If you're diagnosed with an abdominal aortic aneurysm, a risk assessment will be carried out to determine the likelihood of the aneurysm rupturing.

The assessment is usually based on:

- your age
- the size of the aneurysm
- how quickly the aneurysm is growing
- whether a parent, brother, sister, aunt or uncle has had a ruptured aneurysm
- whether you have high levels of a chemical called MMP-9 in your blood – high levels of MMP-9 can be caused by extensive weakening of the aortic wall

Usually, the recommended treatment options are:

- active observation if the aneurysm is less than 5cm (see below for more details)
- preventative surgery if the aneurysm is 5–5.5cm (2–2.2 inches) and you have one of the risk factors mentioned above
- surgery if the aneurysm is larger than 5.5cm regardless of whether or not you have any associated risk factors

Active observation

Active observation means that you won't have surgery immediately, but you'll be given regular check-ups so that your aneurysm can be carefully monitored. This usually involves having an ultrasound scan every three or six months.

Lifestyle changes to lower your risk of a rupture will usually be recommended.

If you smoke, the most important change you can make is to stop smoking. People who smoke usually have faster-growing aneurysms than non-smokers. The larger the aneurysm, the higher the risk of it rupturing.

Read more about stopping smoking and nicotine replacement therapies (NRTs) that can make it easier to stop smoking.

Other changes you can make include:

- eating a healthy, balanced diet and reducing the amount of fat in your diet
- losing weight if you're overweight
- taking regular exercise

If you have another health condition that's thought to be related to your aneurysm, such as high blood pressure, you may be given medication to treat that condition.

For example:

- angiotensin-converting enzyme (ACE) inhibitors are a type of medication used in the treatment of high blood pressure
- statins are a type of medication used to treat high cholesterol

Surgery

The most commonly used surgical treatment for an abdominal aortic aneurysm is grafting. This involves removing the affected section of the aorta and replacing it with a piece of synthetic tubing known as a graft.

There are two ways that grafting can be done:

- **open surgery** – a large incision is made in your abdomen to expose the aorta and insert the graft
- **endovascular surgery** – this involves sticking a thin tube, called a catheter, into one of the arteries in your legs and then guiding it to the aorta. The graft is then moved through the catheter and used to reinforce the aorta wall

Open or endovascular?

In most cases, your surgical team would usually recommend you have endovascular surgery. It has better outcomes than open surgery for preventing death from a ruptured aneurysm (or other complications).

For example, research has found that around 1 in 20 people died in the first 30 days after open surgery compared to 1 in 50 people who had endovascular surgery.

The long-term outcomes are usually better too. The same research found that 12 months after surgery, 1 in 15 people who had open surgery died due to complications related to their aneurysm. Among those who had endovascular surgery, 1 in 25 died from complications.

Another advantage is that endovascular surgery doesn't involve making a large cut into your abdomen, so it has a much quicker recovery time than open surgery.

However, endovascular surgery has its own disadvantages.

The same research found that risks such as the graft splitting or becoming infected were much higher than in open surgery.

Just under half of people who received endovascular surgery experience complications compared with only 1 in 10 people who received open surgery.

If you develop complications, you may need further surgery to correct them.

Your surgical team will be able to make recommendations, but the ultimate decision is yours.

There may be circumstances in which you're not a suitable candidate for endovascular surgery and open surgery would need to be used. For example, you may have unusually narrow blood vessels or an aneurysm in a position that makes endovascular surgery too difficult.

Emergency treatment

Emergency treatment for a ruptured aortic aneurysm is based on the same principle as preventative treatment. Grafts are used to repair the ruptured aneurysm.

Due to the urgent nature of a ruptured aneurysm, the decision to perform open or endovascular surgery may be determined by the expertise and experience of the surgeons available.

Additional medication and treatments may also be used to prevent blood loss and organ damage. For example, Nimodipine may be recommended. This medication is used to prevent ruptured blood vessels going into spasm and causing further blood loss.

Preventing an abdominal aortic aneurysm

Preventing and reducing high cholesterol

Too much cholesterol in the body causes coronary diseases such as angina, heart attack and stroke.

Reducing your risk of atherosclerosis will help to prevent an abdominal aortic aneurysm occurring.

Diet

One of the leading causes of atherosclerosis is eating a diet that's high in fat.

High-fat foods can cause a build-up of fatty plaques in your arteries. This is because fatty foods contain cholesterol. There are two main types of cholesterol:

- **Low-density lipoprotein (LDL)** – this is mostly made up of fat, plus a small amount of protein. This type of cholesterol can block your arteries, so it's often referred to as bad cholesterol.
- **High-density lipoprotein (HDL)** – this is mostly made up of protein, plus a small amount of fat. This type of cholesterol can reduce any blockage in your arteries, so it's often referred to as good cholesterol.

There are also two types of fat: saturated and unsaturated. Avoid food containing saturated fats because these will increase the levels of bad cholesterol in your blood.

Foods high in saturated fat include:

- meat
- fatty cuts of meat
- butter

- ghee (a type of butter often used in Indian cooking)
- lard
- cream
- hard cheese
- cakes and biscuits
- foods that contain coconut or palm oil

However, eating a small amount of unsaturated fat will increase the level of good cholesterol and reduce any blockage.

Foods that are high in unsaturated fat include:

- oily fish
- avocados
- nuts and seeds
- sunflower, rapeseed and olive oil

Smoking

Smoking is a major risk factor for aneurysms because it causes atherosclerosis and raises your blood pressure. There may also be harmful substances in tobacco smoke that could damage the walls of the arteries.

It is known that smokers are seven times more likely than non-smokers to develop an aortic aneurysm.

High blood pressure

High blood pressure can often be reduced by eating a healthy diet, cutting down on alcohol, maintaining a healthy weight and doing regular exercise.

Diet

The advice on diet above also applies if you have high blood pressure. In addition, cut down on the amount of salt in your food and eat plenty of fruit and vegetables.

Salt raises your blood pressure. The more salt you eat, the higher your blood pressure. Aim to eat less than less than 6g of salt a day – about a teaspoonful.

Eating a low-fat diet that includes lots of fibre (such as wholegrain rice, bread and pasta) and plenty of fruit and vegetables has been proven to help lower blood pressure. Fruit and vegetables are full of vitamins, minerals and fibre to keep your body in good condition. Aim to eat five portions of fruit and vegetables every day. Find out more about getting your 5 a day.

Alcohol

Regularly drinking more alcohol than is recommended will raise your blood pressure over time. Drinking within the recommended limits is the best way to reduce your risk of developing high blood pressure.

iKindness recommends:

- men shouldn't regularly drink more than 3–4 units a day
- women shouldn't regularly drink more than 2–3 units a day

Find out how many units are in your favourite drink, track your drinking over time and get tips to help you cut down on alcohol.

Alcohol is also high in calories, which will make you gain weight. This will also increase your blood pressure. Find out how many calories are in popular drinks.

Weight

Being overweight forces your heart to work harder to pump blood around your body, which can raise your blood pressure. Use the BMI healthy weight calculator to find out if you need to lose weight.

If you need to shed some weight, it's worth remembering that losing just a few pounds will make a big difference to your blood pressure and overall health. Get tips on losing weight safely.

Exercise

Being active and doing regular exercise lowers blood pressure by keeping your heart and blood vessels in good condition. Regular exercise can also help you lose weight, which will also help lower your blood pressure.

Adults should do at least 150 minutes (two hours and 30 minutes) of moderate-intensity aerobic activity every week. Examples of moderate intensity activity include cycling or fast walking. For it to count, the activity should make you feel warm and slightly out of breath. Someone who is overweight may only have to walk up a slope to get this feeling.

Physical activity can include anything from sport to walking and gardening.