CONDITION

Thoracic aortic aneurysm

A thoracic aortic aneurysm is an abnormal widening of the aorta within the chest.

WHAT IT IS
Abnormal widening of the aorta within the chest

BODY SYSTEM
Heart and circulation

MAIN SYMPTOMS
Often none, chest or back pain, cough, hoarseness

WHAT CAUSES IT
Inherited and acquired weakening of the aortic wall

HOW IT IS DIAGNOSED
Echocardiography, CT angiography, or magnetic resonance angiography

MAIN TREATMENT
Monitoring, blood pressure control, or surgical repair

CAN IT BE CURED?
Sometimes - surgery replaces the weakened section

IS IT AN EMERGENCY?
Sometimes - sudden severe chest or back pain

LONG-TERM OUTLOOK
Often stable with monitoring; rupture or dissection can be fatal

Overview

A thoracic aortic aneurysm is an abnormal widening, or bulge, in part of the aorta inside the chest. The aorta is the body's largest artery. It carries blood from the heart to the rest of the body.

The aneurysm may affect the section closest to the heart, called the aortic root or ascending aorta. It may also involve the aortic arch or the descending aorta farther down the chest.

Most thoracic aortic aneurysms grow slowly and cause no symptoms. They are often found during a heart scan or chest scan done for another reason. The main concern is that the weakened part of the aorta could tear or rupture. These complications are uncommon in smaller, stable aneurysms but can be life-threatening.

The level of risk is not based on diameter alone. Location, growth rate, family history, genetic

conditions, body size, heart valve anatomy, and other health issues can all matter. Regular imaging helps track these changes and guides decisions about treatment.

Symptoms

Most people with a thoracic aortic aneurysm have no symptoms. An aneurysm can be present for years before it is discovered.

When symptoms occur, they may result from the enlarged aorta pressing on nearby structures. Possible symptoms include:

These symptoms have many possible causes and do not necessarily mean you have an aneurysm. New or ongoing symptoms should still be assessed, especially if you already have a diagnosed aneurysm.

Sudden, severe chest or back pain is different from a mild or persistent ache. It may be a sign of an aortic dissection, in which the inner layer of the aorta tears, or a rupture. This needs emergency care.

- Persistent pain or discomfort in the chest, upper back, neck, or jaw
- Shortness of breath, cough, or difficulty swallowing
- A hoarse voice
- A feeling of pulsing or pressure in the chest

Causes and risk factors

A thoracic aortic aneurysm develops when part of the aortic wall loses strength. Sometimes there is more than one contributing factor.

Age-related changes and long-term high blood pressure can place extra strain on the aorta. Smoking and hardening of the arteries may also contribute, particularly to aneurysms in the descending aorta.

Some people are born with conditions that affect the structure of the aortic wall. These include Marfan syndrome, Loeys-Dietz syndrome, and vascular Ehlers-Danlos syndrome. A family may also have inherited thoracic aortic disease without an obvious named syndrome.

A bicuspid aortic valve is another risk factor. This means the valve between the heart and aorta has two flaps instead of the usual three. It can be associated with enlargement of the aortic root or ascending aorta.

Other possible causes or risk factors include:

Having one risk factor does not mean that an aneurysm will develop. Some people have no clear cause.

- A close relative with a thoracic aortic aneurysm or aortic dissection
- Previous aortic dissection
- Inflammation of the aorta, called aortitis
- Certain infections, although this is rare
- Major chest injury
- Previous surgery involving the aorta or aortic valve

Diagnosis

A thoracic aortic aneurysm is confirmed with imaging that shows the size and shape of the aorta.

An echocardiogram uses sound waves to produce pictures of the heart. It can show the aortic root and part of the ascending aorta, as well as the aortic valve. However, it cannot always show the entire thoracic aorta.

CT angiography uses X-rays and contrast dye to create detailed images of the aorta. Magnetic resonance angiography, or MRA, uses a magnetic field and usually avoids ionising radiation. The choice depends on the part of the aorta being examined, the urgency, and factors such as kidney function or previous reactions to contrast dye.

Measurements are compared with earlier scans to see whether the aneurysm is growing. Using a consistent imaging method can make these comparisons more reliable.

Assessment may also include blood pressure checks and an examination of the heart and circulation. Genetic counselling or testing may be considered when an inherited cause is suspected. Close relatives may be offered aortic imaging, particularly when there is a family history or a known genetic condition.

Treatment and management

Treatment aims to reduce stress on the aorta, watch for growth, and repair the aneurysm before the risk of a serious complication becomes too high.

A smaller aneurysm that is not growing quickly may be managed with regular scans. The timing

of follow-up imaging is based on its size, location, cause, and previous growth. Keeping these appointments is important because growth usually does not cause symptoms.

Blood pressure treatment reduces strain on the aortic wall. Medicines may include beta blockers like metoprolol or propranolol , angiotensin receptor blockers, or other blood pressure medicines. The right choice is individual and may be influenced by other heart conditions or an inherited aortic disorder.

Other management may include stopping smoking and treating high cholesterol or related artery disease. Avoiding stimulant drugs such as cocaine is especially important because they can cause sudden rises in blood pressure.

Surgery may be recommended if an aneurysm becomes large, grows rapidly, causes symptoms, or carries increased risk because of its location or cause. There is no single size threshold that applies to everyone.

Open surgery replaces the weakened part of the aorta with a synthetic tube called a graft. If the aortic valve is affected, it may be repaired or replaced at the same operation.

Some aneurysms in the descending thoracic aorta can be treated with thoracic endovascular aortic repair, or TEVAR. A stent graft is guided through an artery, usually from the groin, and placed inside the aorta. Whether this is suitable depends on the aneurysm's location and the surrounding blood vessels.

Repair treats the most dangerous section but does not always remove the underlying tendency to develop aortic enlargement. Imaging follow-up remains important after either open or endovascular treatment.

Complications

An aortic dissection happens when blood enters a tear in the inner wall of the aorta and separates its layers. It can reduce blood flow to the heart, brain, kidneys, spinal cord, or limbs.

A rupture is a break through the full thickness of the aortic wall, causing internal bleeding. Both dissection and rupture are medical emergencies.

An aneurysm near the heart may stretch the aortic valve so that it does not close properly. This allows blood to leak backward into the heart, known as aortic regurgitation. Over time, severe leakage can contribute to heart failure.

Large aneurysms can also press on the airway, oesophagus, or nearby nerves. Less commonly, blood clots can form within an aneurysm and affect circulation elsewhere.

Prevention

Not every thoracic aortic aneurysm can be prevented. Inherited changes, a bicuspid aortic valve, and some inflammatory conditions are not caused by lifestyle.

You may be able to lower added stress on the aorta by:

Exercise is usually part of maintaining heart health, but very heavy lifting and intense straining can cause sharp increases in blood pressure. If you have an aneurysm, seek individual guidance about safe activity rather than stopping all exercise.

If thoracic aortic disease runs in your family, genetic assessment and imaging can identify relatives who need monitoring. This does not prevent an inherited condition, but it may allow changes to be found earlier.

- Keeping blood pressure within the target set for you
- Not smoking and seeking support to stop if needed
- Taking prescribed cardiovascular medicines consistently
- Avoiding cocaine and other non-medical stimulant drugs
- Attending recommended scans and follow-up visits

Living with it and what to expect

Many thoracic aortic aneurysms remain stable for months or years. Others gradually enlarge, and a smaller number grow more quickly. Scans are the only reliable way to know which course an aneurysm is taking.

Living with an aneurysm can cause worry, particularly around exercise, travel, or waiting for scan results. A clear follow-up plan can help. It should explain how often imaging is needed, which symptoms need attention, and whether there are limits on lifting or other activities.

Most day-to-day activities can often continue when an aneurysm is stable. Activity advice may be more cautious for larger aneurysms, rapidly growing aneurysms, or inherited aortic conditions.

Pregnancy increases the workload on the heart and aorta. Anyone with a known aneurysm or inherited aortic condition who may become pregnant should have specialist advice before pregnancy when possible. Monitoring and delivery planning are based on the part and size of the aorta affected.

After repair, recovery time differs between open surgery and TEVAR. Long-term scans are still

needed to check the graft and the remaining aorta. New enlargement can occur in a different section, especially when there is an inherited cause.

When to get medical help

Call emergency services immediately for:

Do not drive yourself if an aortic emergency may be occurring.

Arrange prompt medical assessment for new persistent chest or back discomfort, new hoarseness, trouble swallowing, unexplained shortness of breath, or a change in your usual symptoms.

Routine follow-up is appropriate when you feel well and are attending planned scans and blood pressure reviews. Contact your healthcare service if you miss a scan, cannot take your medicine, or are unsure about activity, pregnancy, or family screening.

- Sudden, severe chest, upper back, neck, jaw, or abdominal pain
- Pain described as tearing or ripping, especially if it moves
- Sudden fainting, severe breathlessness, weakness, or confusion
- New trouble speaking, facial drooping, or weakness on one side
- Sudden loss of feeling, severe pain, or coldness in a limb

Common questions

How serious is a thoracic aortic aneurysm?

It can be serious because a large or rapidly growing aneurysm may dissect or rupture. However, many aneurysms are found before this happens and can be monitored or repaired. Your risk is shaped by the aneurysm's size, location, growth, and underlying cause.

Can a thoracic aortic aneurysm shrink?

Most do not return to a normal size without repair. Good blood pressure control may reduce strain and help slow growth, but it does not usually remove the enlargement. Small differences between scans can sometimes reflect how the measurements were taken.

What size aneurysm needs surgery?

There is no single answer for everyone. Surgery is considered using the diameter, growth rate, symptoms, aortic location, body size, valve anatomy, family history, and any genetic condition. Some inherited conditions lead to repair at a smaller diameter.

Can I exercise with a thoracic aortic aneurysm?

Many people can do moderate aerobic activity, such as walking, if their condition is stable. Heavy lifting, breath-holding, and intense straining may need limits because they raise blood pressure quickly. Activity advice should match your aneurysm and overall health.

Is a thoracic aortic aneurysm hereditary?

Sometimes. It may occur with a named genetic syndrome, a bicuspid aortic valve, or an inherited tendency that affects several relatives. If a close relative has had a thoracic aneurysm or dissection, family imaging or genetic counselling may be appropriate.

Can surgery permanently fix it?

Surgery can replace or reinforce the affected section and greatly reduce the danger from that aneurysm. It does not always cure the underlying weakness throughout the aorta. Lifelong imaging may therefore be needed, even after a successful repair.

Sources

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