PROCEDURE

Aortic aneurysm repair - endovascular

Endovascular aortic aneurysm repair places a stent graft inside the aorta to reduce the risk of rupture.

PURPOSE
Prevent rupture by reinforcing the weakened aorta

PROCEDURE TYPE
Therapeutic, minimally invasive catheter-based repair

WHERE IT IS DONE
Operating theatre or hybrid interventional suite

ANAESTHESIA
General, or local with moderate sedation

HOW LONG IT TAKES
Usually 1 to 3 hours

PREPARATION
Fasting, blood tests, imaging, and medicine review

RECOVERY
Usually 1 to 3 days; no driving until medically cleared

MAIN RISKS
Endoleak, bleeding, kidney injury, graft blockage or movement

RESULTS
Initial result immediately; follow-up imaging checks the graft

Overview

Endovascular aortic aneurysm repair treats a weakened, enlarged area of the aorta, the main artery carrying blood from your heart to your body.

A vascular specialist guides a fabric-covered metal tube, called a stent graft , through an artery, usually from the groin. The graft opens inside the aorta so blood flows through it instead of pressing directly against the weakened wall. The aneurysm is not removed; it is sealed off to reduce the risk of rupture.

Abdominal repair is often called EVAR . Repair in the chest is called TEVAR , or thoracic endovascular aortic repair. Complex aneurysms may need grafts with openings or branches for major arteries.

Endovascular repair usually has smaller incisions and a shorter initial recovery than open surgery. However, long-term imaging is required because leaks or graft changes can develop later.

Why the procedure is performed

Repair may be recommended when the risk of rupture is greater than the risks of treatment. Your team considers the aneurysm's size, location, shape, growth, symptoms, and your overall health.

Endovascular repair may be offered when the aneurysm:

The decision is not based on size alone. There must be suitable healthy artery where the graft can seal, and the arteries used to insert it must be accessible.

- Has reached a size where repair is advised
- Is growing quickly
- Is causing symptoms
- Has ruptured or may be close to rupturing
- Can be treated more safely this way than with open surgery

Who should and should not have it

You may be a candidate if repair is needed and your anatomy is suitable for a stent graft. It can be particularly useful when heart, lung, or other conditions make open surgery riskier.

It may not be appropriate if there is no safe place for the graft to attach, access arteries are too narrow or diseased, or important branches of the aorta cannot be protected.

Elective repair may be delayed because of active infection, uncontrolled illness, or a blood-clotting problem. Pregnancy may affect timing because X-rays are used.

Kidney disease or a previous contrast-dye reaction does not always prevent treatment. The team may reduce or change the contrast, provide preventive care, or recommend another approach. During a rupture, the need to stop bleeding may outweigh concerns that would delay elective repair.

How to prepare

Follow your treating facility's instructions, as preparation depends on the aneurysm, graft, anaesthesia, and your health.

You will usually have detailed CT imaging to plan the graft. Blood tests may check kidney function, blood count, and clotting. Heart or lung tests may also be required.

Tell the team about all medicines, supplements, allergies, kidney problems, and previous reactions to contrast dye or anaesthesia. Blood thinners and some diabetes medicines need special instructions. Do not stop prescribed medicine unless your team tells you to.

Follow the facility's exact fasting instructions. Arrange for someone to take you home, and bring a current medicine list and any requested medical device or advance-care information.

What happens during the procedure

Your heart rate, blood pressure, breathing, and oxygen level are monitored. You may receive general anaesthesia or local anaesthetic with sedation. A urinary catheter or additional monitoring lines may be used.

The specialist makes small cuts or needle punctures in one or both groins. Using moving X-ray images, called fluoroscopy, the team guides wires and the folded graft through the arteries into the aorta. Contrast dye makes the blood vessels visible.

The graft is positioned across the aneurysm and expanded. Some repairs use connected sections or branches to maintain blood flow to major arteries.

The team checks blood flow and whether the aneurysm is sealed. The tubes are removed, and the groin arteries are closed with stitches, closure devices, or a small surgical repair. You then move to a recovery or higher-monitoring unit.

Recovery and what to expect afterward

Pain: Groin soreness, bruising, back discomfort, and tiredness are common and usually improve over several days. Tell the hospital team if pain is severe or increasing.

Eating: You can usually drink and eat once awake and not feeling sick. Fluids may be encouraged when safe for you.

Activity: Staff may help you walk within the first day. Avoid heavy lifting and strenuous activity until the puncture sites heal and your team says it is safe.

Driving: You cannot drive yourself home. Do not drive while taking medicines that cause drowsiness, while movement is painful, or until you can safely make an emergency stop. Follow

your team's restriction.

Returning to work: Light work may be possible within one or two weeks after an uncomplicated repair. Recovery may take longer after complex or emergency repair or for physically demanding work.

Risks and possible complications

An endoleak occurs when blood continues to flow into or around the aneurysm sac. Some can be monitored; others need another procedure.

Other risks include:

TEVAR may affect blood flow to the brain or spinal cord, causing stroke or leg weakness. Serious complications and death are possible, especially after rupture. Risk depends on the aneurysm's location, urgency, anatomy, and your health.

- Bleeding, bruising, or artery damage at the groin
- Kidney injury, including from contrast dye
- Graft movement, folding, infection, blockage, or blood clots
- Reduced blood flow to a leg, bowel, kidney, or another organ
- Heart or breathing complications
- Continued aneurysm growth or later rupture
- A need for another procedure

Results and follow up

The team can usually tell during the procedure whether the graft was placed as planned. Before discharge, you will receive instructions about wound care, activity, medicines, and follow-up. Ask whether you should carry information identifying your graft.

Follow-up imaging is essential. CT angiography, ultrasound, or other scans check the graft's position, aneurysm size, and whether blood is entering the aneurysm sac. Timing depends on the type of repair and previous results.

Long-term monitoring remains necessary. An endoleak, graft movement, blockage, or aneurysm growth may require closer observation or another procedure.

Alternatives

Regular imaging surveillance may be suitable when the aneurysm is smaller or repair risks currently outweigh the benefits. The aneurysm may grow and require later treatment.

Open surgical repair replaces the weakened section through a larger chest or abdominal incision. Recovery is longer, but it may be more durable and better suited to anatomy that cannot support an endovascular graft.

Specialist complex endovascular repair uses fenestrated or branched grafts to preserve blood flow through major arteries. It may avoid open surgery but requires additional planning and may carry extra risks.

No repair or comfort-focused care may be reasonable when treatment is unlikely to improve survival or quality of life. This avoids a major procedure but accepts the risk of rupture.

When to call your healthcare team

Contact your healthcare team promptly for increasing groin redness, swelling, drainage, fever, worsening pain, reduced urine, persistent vomiting, or new abdominal, chest, or back discomfort. Also call if a foot becomes unusually cool, pale, numb, or painful.

Seek emergency help for sudden severe chest, back, or abdominal pain; fainting; severe breathlessness; new one-sided weakness; difficulty speaking; or sudden loss of movement or feeling in a leg. Do not drive yourself.

Common questions

Will I be asleep?

Many repairs use general anaesthesia. Some standard EVAR procedures use local anaesthetic with sedation.

Can I drive home?

No. Arrange transport. Drive again only when sedating medicines no longer affect you, you can move comfortably, and your team has cleared you.

How painful is it?

Most people have groin soreness or bruising rather than pain from a large incision. Complex or emergency repairs may cause more discomfort.

When will I know if it worked?

The initial result is usually known during the procedure. Follow-up scans confirm that the aneurysm remains sealed and the graft stays in position.

Will I need scans forever?

Long-term imaging is generally required because endoleaks, graft movement, or aneurysm enlargement can develop even when you feel well.

Sources

- Isselbacher EM, Preventza O, Hamilton Black J III, et al. "2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease." Circulation . 2022;146:e334-e482.
- Wanhainen A, Van Herzeele I, Bastos Goncalves F, et al. "European Society for Vascular Surgery 2024 Clinical Practice Guidelines on the Management of Abdominal Aorto-Iliac Artery Aneurysms." European Journal of Vascular and Endovascular Surgery . 2024;67:192-331.
- National Institute for Health and Care Excellence. Abdominal aortic aneurysm: diagnosis and management . NICE guideline NG156.
- U.S. Food and Drug Administration. Endovascular Grafts for Abdominal Aortic Aneurysms: Information for Patients .
- NHS. Abdominal aortic aneurysm: Treatment . National Health Service patient information.