PROCEDURE

Endovascular embolization

Endovascular embolization blocks selected blood vessels from inside the body using a thin catheter.

PURPOSE
Block targeted vessels to control bleeding or abnormal blood flow

PROCEDURE TYPE
Therapeutic; minimally invasive interventional radiology

WHERE IT IS DONE
Interventional radiology suite or operating theatre

ANAESTHESIA
Local with moderate sedation, or general anaesthesia

HOW LONG IT TAKES
Usually 1-3 hours; complex cases may take longer

PREPARATION
Fasting, medication review, blood tests, and arranged transport

RECOVERY
Same day or overnight; driving restricted after sedation or anaesthesia

MAIN RISKS
Bleeding, vessel injury, non-target blockage, contrast reaction

RESULTS
Technical result immediately; symptom response may take days or weeks

Overview

Endovascular embolization is a minimally invasive procedure that deliberately blocks one or more blood vessels. "Endovascular" means the procedure is performed from inside a blood vessel.

An interventional radiologist or another specialist inserts a thin tube called a catheter, usually through an artery in your groin or wrist. Live X-ray imaging guides the catheter to the vessel being treated. The specialist then releases material that reduces or stops blood flow.

The blocking material may include metal coils, plugs, tiny particles, medical glue, or a sponge-like substance. Some materials are permanent, while others are absorbed by the body.

Embolization may be planned or performed urgently to control serious bleeding. The exact

approach and recovery depend on which part of your body is treated.

Why the procedure is performed

Embolization can stop bleeding, reduce blood flow to abnormal tissue, or protect a weakened blood vessel.

It may be used to:

The aim may be to stop blood flow completely or reduce it enough to control the condition safely.

- Control bleeding after an injury, operation, or childbirth
- Treat abnormal connections between arteries and veins
- Block blood flow into certain aneurysms, which are bulges in arteries
- Reduce blood flow to tumours
- Treat uterine fibroids, which are non-cancerous growths in the womb
- Treat enlarged blood vessels that are causing pain or other problems
- Reduce bleeding before another operation

Who should and should not have it

You may be offered embolization when imaging shows a blood vessel that can be reached safely with a catheter and blocking it is likely to help. It can sometimes avoid a larger operation or be used when surgery would carry greater risk.

Embolization is not right for everyone. It may be avoided if blocking the vessel could seriously damage healthy tissue or if the abnormal vessel cannot be reached safely. Another treatment may also provide a better or more lasting result for your condition.

A planned procedure may need to be delayed if you have an active infection, a blood-clotting problem that cannot yet be corrected, or an illness that makes sedation unsafe. Kidney disease or a previous serious reaction to X-ray contrast does not always prevent treatment, but it may require a different plan.

Tell your healthcare team if you may be pregnant. Embolization uses X-rays, so the team must weigh the benefits and risks carefully. In an emergency, treatment may still be needed even when some of these concerns are present.

How to prepare

Your treating facility's own instructions take priority because preparation differs according to the treatment site and type of anaesthesia.

You may be asked to stop eating and drinking for several hours. Follow the stated times closely. Some procedures require blood tests to check kidney function, blood cell levels, and how well your blood clots.

Give the team a current list of your medicines and supplements. In particular, tell them about blood thinners like warfarin or apixaban , diabetes medicines, and medicines that affect kidney function. Do not stop a prescribed medicine unless the treating team tells you to do so.

Tell the facility about allergies, previous reactions to X-ray contrast, kidney problems, pregnancy, sleep apnoea, or previous difficulties with anaesthesia.

Arrange for someone to take you home if you will receive sedation or general anaesthesia. You may also need someone to stay with you that night.

What happens during the procedure

You will change into a gown and usually have an intravenous line placed in your arm. Monitoring equipment checks your heart rate, blood pressure, and oxygen level.

You may receive local anaesthetic to numb the catheter entry site. Moderate sedation makes you relaxed and drowsy, but you may still respond to instructions. General anaesthesia makes you fully unconscious and is used for some longer, complex, or particularly sensitive procedures.

The specialist makes a small puncture, usually in the groin or wrist, and places a catheter into an artery. Contrast liquid is injected while X-ray images are taken. You may briefly feel warmth when contrast is given.

The catheter is guided into the target vessel. Coils, particles, glue, plugs, or another embolic material are then released. More images confirm whether blood flow has been reduced or stopped.

The catheter is removed when treatment is complete. Pressure or a closure device is used to seal the entry site. A dressing is placed over it.

Recovery and what to expect afterward

Pain depends on the area treated. The catheter site may feel bruised or tender. Embolization of an organ or tumour can cause stronger cramping or aching as blood flow decreases. Pain relief and anti-nausea treatment are available.

You can usually drink and eat once you are awake, unless another procedure or medical concern requires continued fasting.

You may need to lie flat for a few hours after groin access. Avoid strenuous activity, heavy lifting, and soaking the puncture site until your team says these are safe. Follow any treatment-specific restrictions.

Do not drive yourself home after sedation or general anaesthesia. Your facility will tell you when driving is safe again; this is commonly restricted for at least the rest of the day.

Some people go home the same day. Others stay overnight or longer, especially after emergency treatment or embolization of a major organ. Return to work may take a few days or longer depending on your job, the treatment site, and how you feel.

Risks and possible complications

The team plans embolization carefully, but complications are possible.

Risks include:

Pain, tiredness, nausea, or a mild fever can occur after some embolization procedures. This group of effects is called post-embolization syndrome. Your team should explain what is expected for your particular treatment.

Procedures involving blood vessels in the brain, spine, lungs, or other major organs have additional site-specific risks. These can include stroke, breathing problems, or loss of organ function. Ask about the risks that apply to the vessel being treated.

- Bleeding, bruising, infection, or artery damage at the catheter site
- A blood clot or injury within the treated artery
- Embolic material reaching the wrong vessel and damaging healthy tissue
- Reduced blood flow causing unintended tissue injury
- An allergic reaction or kidney injury from contrast
- Infection in the treated area
- Side effects from sedation or anaesthesia
- Failure to block the vessel fully or reopening of the vessel later

Results and follow up

The specialist can usually see during the procedure whether blood flow has stopped or decreased. They may discuss this initial result after you have recovered from sedation.

The clinical benefit may take longer. Bleeding control may be clear immediately, while a tumour, fibroid, or vascular abnormality may change over weeks or months.

Follow-up may include a clinic visit, blood tests, ultrasound, CT, MRI, or another angiogram. These checks look for healing, remaining blood flow, or reopening of the treated vessel. Further embolization or another treatment is sometimes needed.

Alternatives

The alternatives depend on why embolization has been offered.

Observation may be reasonable when the abnormality is stable and unlikely to cause harm. It avoids an invasive procedure but does not correct the blood vessel problem.

Medicines may control symptoms or reduce bleeding in some conditions. They are easier to take but may not work quickly enough or provide lasting control.

Endoscopy can treat bleeding inside the digestive tract without entering an artery. It may not reach bleeding that comes from deeper tissue or cannot be seen from inside the bowel.

Open or keyhole surgery can remove, repair, or tie off abnormal vessels. Surgery may offer direct or definitive treatment, but usually involves larger wounds and a longer recovery.

For tumours, options may include surgery, heat or cold ablation, radiotherapy, or drug treatment. These affect the tumour differently and may be used with, rather than instead of, embolization.

For uterine fibroids, alternatives include medicines, myomectomy to remove fibroids, or hysterectomy to remove the womb. These choices differ in recovery time, likelihood of fibroid return, and effects on future pregnancy.

When to call your healthcare team

Contact your healthcare team promptly for worsening pain, repeated vomiting, a persistent fever, increasing redness or drainage at the puncture site, or new swelling. Also call if the treated arm or leg becomes increasingly painful, numb, pale, or cool.

A small bruise at the entry site and mild tenderness can be part of routine recovery. Mention

symptoms that are not improving at your planned follow-up.

Seek emergency help for:

Your discharge instructions may list additional warning signs specific to the area treated.

- Bleeding from the catheter site that does not stop with firm pressure
- Sudden weakness, facial drooping, difficulty speaking, or confusion
- Severe chest pain or difficulty breathing
- Fainting or signs of a severe allergic reaction
- A suddenly cold, pale, severely painful, or numb arm or leg
- A seizure or sudden severe headache after brain-related treatment

Common questions

Will I be asleep?

Not always. Many embolizations use local anaesthetic with moderate sedation, so you are drowsy but may hear voices or follow instructions. General anaesthesia is used for some procedures.

Can I drive home?

No if you have received sedation or general anaesthesia. Arrange for an adult to take you home and follow the facility's driving restrictions.

How painful is embolization?

The numbing injection may sting briefly, and you may feel pressure at the catheter site. Pain afterward ranges from mild bruising to stronger cramping, depending on the organ treated.

When will I know whether it worked?

The specialist usually knows immediately whether the target vessel was blocked. Symptom improvement may be immediate or may take several weeks.

Will the material stay inside me?

Some coils, plugs, particles, and medical glues remain permanently. Other materials dissolve over time. Your specialist can tell you what will be used.

Will I need to stay in hospital?

Many planned procedures allow discharge the same day or after one night. Emergency or complex treatment may require a longer stay.

Sources

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