PROCEDURE

Angioplasty and stent placement - carotid artery

A minimally invasive procedure that widens a narrowed carotid artery and holds it open with a stent.

PURPOSE
Restore blood flow through a narrowed carotid artery

PROCEDURE TYPE
Therapeutic, minimally invasive interventional radiology

WHERE IT IS DONE
Operating theatre or specialist angiography suite

ANAESTHESIA
Local anaesthesia, often with moderate sedation

HOW LONG IT TAKES
About one to two hours

PREPARATION
Fasting, antiplatelet medicines, and individual blood-thinner instructions

RECOVERY
Usually overnight; no driving until medically cleared

MAIN RISKS
Stroke, bleeding, artery injury, contrast-related kidney injury

RESULTS
Technical result known immediately; ultrasound later checks blood flow

Overview

Carotid angioplasty and stent placement treats narrowing in a carotid artery, one of the main blood vessels carrying blood to the brain.

Narrowing is usually caused by fatty plaque. Plaque or a blood clot can block blood flow to the brain, causing a transient ischaemic attack (TIA) or stroke.

A catheter is guided into the narrowed artery. A small balloon may widen it, and a permanent mesh tube called a stent holds it open. The procedure is less invasive than carotid endarterectomy, but it still has important risks.

Why the procedure is performed

The goal is to improve blood flow and reduce the risk of a future stroke.

Stenting may be considered for significant narrowing after symptoms such as a TIA, minor stroke or temporary loss of vision in one eye. Assessment is usually prompt because timing may affect treatment.

It may also be considered for severe narrowing without symptoms or when surgery is difficult because of previous neck surgery, radiation, artery location or other medical conditions. Many people, especially those without symptoms, are treated with medicines and monitoring instead.

Who should and should not have it

Your team will compare carotid stenting with medical treatment and carotid endarterectomy. Stenting may be appropriate when narrowing is significant, treatment is likely to reduce stroke risk and the artery can be reached safely.

It may be avoided, delayed or replaced if:

Older adults may have a higher stroke risk with standard stenting through the groin than with carotid endarterectomy. The best option depends on your health and artery anatomy.

- The carotid artery is completely blocked
- The artery's shape, plaque or calcification makes stenting unsafe
- You cannot safely take the required antiplatelet medicines
- You have active bleeding or a recent serious brain bleed
- Kidney disease makes contrast dye especially risky
- A severe contrast allergy cannot be managed safely
- Blood pressure or another condition needs stabilising
- The likely benefit does not justify the risk

How to prepare

Follow your facility's instructions, as medicine and fasting plans vary.

Tell the team about all medicines and supplements you take, including aspirin, clopidogrel,

warfarin, apixaban, rivaroxaban or dabigatran. Do not stop these medicines on your own.

You will usually need antiplatelet medicines before and after stenting to prevent a clot inside the stent. Take them exactly as prescribed.

Tell the facility if you have kidney disease, diabetes, a bleeding condition or a previous contrast-dye reaction. You may need blood tests and imaging such as ultrasound or CT angiography.

Do not eat or drink for the period specified. Ask which regular medicines to take that morning and whether to use a small sip of water. Arrange transport home, bring your medicine list and plan for a possible overnight stay.

What happens during the procedure

You lie on an X-ray table while the team monitors your heart rate, blood pressure and oxygen level. An intravenous line is placed in your arm.

Local anaesthetic numbs the catheter entry site, usually in the groin or wrist. Sedation may help you relax while allowing you to respond. Some approaches use general anaesthesia.

A catheter is guided to the carotid artery using moving X-rays. Contrast dye shows the narrowing and may briefly cause a warm feeling. A protection device may be placed to catch plaque debris.

The stent is expanded across the narrowing. A balloon may be used before or after placement. Balloon inflation can briefly slow your heart rate or lower your blood pressure, which can be treated with medicine.

The team may ask you to speak or move a hand to check brain function. The catheter is then removed, and pressure or a closure device seals the entry site.

Recovery and what to expect afterward

You will have frequent blood pressure and neurological checks. If the catheter entered through the groin, you may need to lie flat for several hours.

Mild bruising or tenderness is common. Report worsening pain, swelling, bleeding or a severe or unusual headache. Follow instructions about fluids, wound care, lifting and exercise.

Do not drive yourself home. Resume driving only when your team says it is safe; a recent TIA or stroke may create additional legal restrictions. Many people return to light work within several days, but recovery may take longer after a stroke or for physical work.

Risks and possible complications

The main serious risk is stroke during or soon after the procedure if plaque or a clot travels to the brain. A stroke may cause lasting disability or death.

Other complications include:

A sudden increase in blood flow can rarely cause brain swelling or bleeding. Warning signs include severe headache, seizure, confusion or new neurological symptoms and require emergency care.

- Bleeding, bruising or artery damage at the catheter site
- A clot inside the stent
- Slow heart rate or low blood pressure
- Contrast allergy or kidney injury
- Tearing of the carotid artery
- Heart attack
- New narrowing inside the stent

Results and follow up

The team can usually see immediately whether the stent opened the artery.

Because stenting does not remove the tendency to form plaque, you may still need antiplatelet and cholesterol-lowering medicines, blood pressure or diabetes treatment, and support to stop smoking.

Do not stop antiplatelet medicine unless the clinician managing your stent tells you to. Stopping too early can cause a dangerous clot.

Follow-up usually includes clinical review and carotid ultrasound to check blood flow through the stent. Your facility will set the schedule.

Alternatives

Carotid endarterectomy removes plaque through an incision in the neck. It may have a lower procedural stroke risk than standard stenting for some people, but carries surgical risks such as wound problems, nerve injury and anaesthesia complications.

Medical treatment includes antiplatelet and cholesterol-lowering medicines, blood pressure and diabetes management, exercise, diet changes and stopping smoking. It may be preferred when there are no symptoms or procedural risks outweigh the benefit.

Monitoring with repeat ultrasound may be appropriate when narrowing does not yet justify intervention.

Transcarotid artery revascularisation (TCAR) places a stent through a small neck incision while temporarily redirecting blood flow to reduce plaque travelling to the brain. It is not available everywhere and still carries stroke, bleeding and stent-related risks.

When to call your healthcare team

Contact your healthcare team promptly for increasing puncture-site pain, redness or swelling; a new lump; fever; worsening neck discomfort; or advice about missed antiplatelet medicine.

Seek emergency help immediately for:

Do not drive yourself if stroke symptoms or heavy bleeding occur.

- New facial drooping, weakness or numbness
- Trouble speaking, understanding speech, seeing or walking
- Sudden confusion, collapse or seizure
- A sudden severe headache
- Heavy bleeding that does not stop with firm pressure
- Chest pain, severe breathlessness or loss of consciousness

Common questions

Will I be asleep?

Usually not. Local anaesthetic numbs the entry site, and sedation may make you relaxed or drowsy. Some approaches use general anaesthesia.

Can I drive home?

No. Arrange transport home and wait until your team clears you to drive.

How painful is it?

You may feel an anaesthetic sting, pressure at the catheter site and warmth from contrast. Report severe pain immediately.

When will I know if it worked?

The result is usually visible during the procedure. Later ultrasound checks that the stent remains open.

Does the stent stay in permanently?

Yes. The artery's inner lining gradually grows around it.

Can the artery narrow again?

Yes. Tissue or plaque can narrow the area in or beside the stent, so follow-up ultrasound is important.

Sources

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