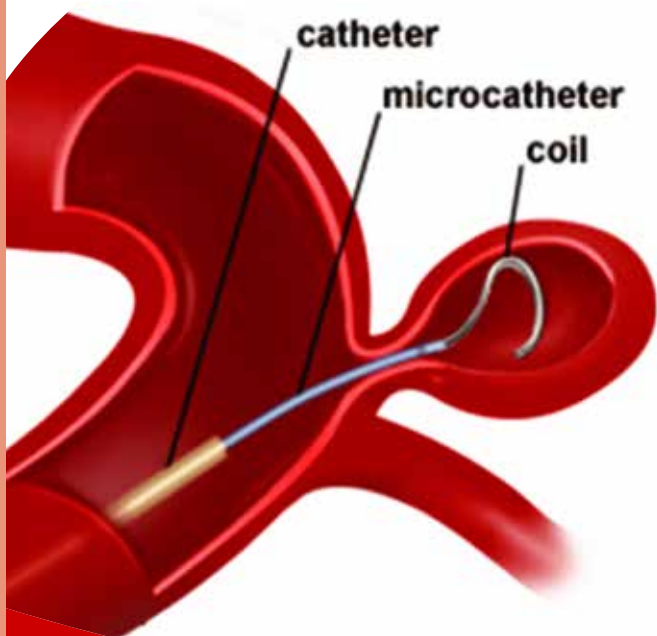




Embolisation of Brain Aneurysms and Arteriovenous Malformations/ Fistulas



What is Embolisation of Brain Aneurysms and Arteriovenous Malformations/ Fistulas?

Embolisation of brain aneurysms and arteriovenous malformations (AVM)/fistulas is a minimally invasive treatment for aneurysms and other blood vessel malformations that occur in the brain. These problems are typically identified in adults; however, aneurysms and AVMs can also occur in children.

An aneurysm is a bulge or sac that develops in an artery because the wall of the vessel is weak. A bulging aneurysm in the brain may compress surrounding nerves and brain tissue resulting in nerve paralysis, headache, neck and upper back pain as well as nausea and vomiting. If an aneurysm in the brain ruptures, causing an opening in the wall, the resulting bleeding in the head may cause a stroke or death.

An AVM is an abnormal connection or passageway between the arteries and veins. AVMs may prevent oxygenated blood from completely circulating throughout the brain, causing symptoms including, but not limited to:

- unusual sound in one ear (pulsating or humming)
- neurological symptoms
- increased pressure in the eye (glaucoma)
- double vision
- pain

How should I prepare for the procedure?

Prior to your procedure, you will have to go for a blood test to determine how well your kidneys are functioning and whether your blood clots normally.

You should report to your doctor all medications that you are taking, including herbal supplements, and if you have any allergies, especially to local anaesthetic medications, general anaesthesia or to contrast materials containing iodine (sometimes referred to as “dye” or “x-ray dye”). Your physician may advise you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners for a specified period of time before your procedure.

Also inform your doctor about recent illnesses or other medical conditions.

Women should always inform their physician and radiographer if there is any possibility that they are pregnant. Many imaging tests are not performed during pregnancy so as not to expose the foetus to radiation.

How does the procedure work?

In an embolisation procedure, a catheter, (a long, thin, hollow plastic tube), is inserted through the skin into an artery and, using image-guidance, maneuvered through the body to the site of the aneurysm or AVM. For aneurysms, one or more coils are inserted through the catheter and placed within the aneurysm. The body responds by healing around the coil(s), which helps block the flow of blood into the aneurysm, preventing it from rupturing or leaking. For AVMs, a similar catheter is placed at the point of abnormal connection between arteries and veins. A liquid adhesive agent is then injected to plug this connection. Other connections requiring similar treatment are then treated with additional catheters placed in their locations.

How is the procedure performed?

- Image-guided, minimally invasive procedures such as brain aneurysm embolisation are most often performed by a specially trained interventional neuroradiologist in an interventional radiology suite.
- Prior to your procedure, computed tomography (CT) or magnetic resonance imaging (MRI) may be performed.
- You will be positioned on the examination table.

- You will be connected to monitors that track your heart rate, blood pressure and pulse during the procedure.
- A doctor or nurse will insert an intravenous (IV) line into a vein in your hand or arm so that sedative medication can be given intravenously. Moderate sedation may be used. As an alternative, you may receive general anaesthesia.
- The area of your body where the catheter is to be inserted will be shaved, sterilized and covered with a surgical drape.
- Your physician will numb the area with a local anaesthetic.
- A very small skin incision is made at the site.
- Using image-guidance, a catheter, a long, thin, hollow plastic tube, is inserted through the skin and advanced to the site of the aneurysm or AVM. Once the catheter is in position, detachable coils are inserted and positioned in the aneurysm. Liquid agents are used to plug the AVM.
- At the end of the procedure, the catheter will be removed and pressure will be applied to stop the bleeding. The opening in the skin is then covered with a dressing. No sutures are needed.
- This procedure is usually completed in one to two hours; however, it may last up to several hours.

What will I experience during the procedure?

Devices to monitor your heart rate and blood pressure will be attached to your body.

You will feel a slight needle prick when the needle is inserted into your vein for the intravenous line (IV) and when the local anaesthetic is injected. The arteries have no sensation. Most of the sensation is at the skin incision site which is numbed using local anesthetic.

If you receive a general anaesthetic, you will be unconscious for the entire procedure, and you will be monitored by an anaesthesiologist.

If the case is done with sedation, the intravenous (IV) sedative will make you feel relaxed and sleepy. You may or may not remain awake, depending on how deeply you are sedated.

You may feel slight pressure when the catheter is inserted, but not much discomfort.

Who interprets the results and how do I get them?

The interventional neuroradiologist will evaluate your procedure and results and coordinate appropriate follow-up care with your referring physician.

What are the benefits vs. risks?

BENEFITS

- Using detachable coils to close off an aneurysm is effective in prolonging life and relieving symptoms.
- Embolisation is a treatment for cerebral aneurysms and AVMs that previously were considered inoperable. This procedure is less invasive and requires significantly less recovery time than open surgery.
- No surgical incision is needed—only a small nick in the skin that does not have to be closed by stitches.

RISKS

- Any procedure where the skin is penetrated carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- Any procedure that involves placement of a catheter inside a blood vessel carries certain risks. These risks include damage to the blood vessel, bruising or bleeding at the puncture site and infection.
- There is always a chance that an embolic agent can lodge in the wrong place and deprive normal tissue of its oxygen supply.
- There is a slight risk of death or illness. Approximately seven percent of cases require additional treatment or surgery.
- The potential complications of embolisation with coils or liquid embolic agents include:
 - stroke due to occlusion of an artery to the brain by small blood clot, the liquid embolic agent itself or prolapse of coils into the parent artery.
 - intracranial bleeding due to rupture of the arteriovenous malformation or aneurysm.
 - a remote risk that the catheter cannot be retrieved due to adhesion of the catheter tip to the liquid embolic agent. In such cases, the catheter will be cut and left within the blood vessel. You may be started on a course of blood thinner therapy.
- Depending on the size and configuration of your aneurysm/AVM, there will be possibility of residual or recurrent lesion following the embolisation. Post embolisation follow-up is essential.
- There is a risk of haematoma and infection at the groin puncture site. It is also possible that the puncture hole of the artery does not heal completely, resulting in a pseudoaneurysm. This may require further compression or surgery.

What are the limitations of Embolisation of Brain Aneurysms and AVMs?

Durable effect: Recurrence depends on the coils' success or failure in controlling the "neck" of the aneurysm. If the coil completely prevents blood flow into the aneurysm, then the patient need not be concerned about recurrence. The durability of coil embolisation varies depending on the size and shape of the aneurysm. Coil embolisation of small aneurysms with small necks has better results than embolisation of large or giant aneurysms with wide necks. Long-term follow-up has shown permanent success in more than 80 percent of aneurysms treated with coil embolisation. Additional medical technologies, such as balloon assistance and microstenting are improving the success of treating brain aneurysms with coil embolisation. Unfortunately, large aneurysms with wide necks remain a challenge. AVMs can be well treated through these embolisation techniques, although continued checkups are required.

I confirm that I understand the information herein about Embolisation of Brain Aneurysms and Arteriovenous Malformations/Fistulas as it has been read by me and / or explained to me.

Name: _____

*Passport/NRIC No: _____

Signature: _____

Date: _____

Confirmation given before (Staff's name): _____

Staff's Signature: _____

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