

# Brain aneurysm

An aneurysm is a bulge in a blood vessel that's caused by a weakness in the blood vessel wall. As the blood passes through the weakened blood vessel, blood pressure causes it to bulge outwards like a balloon. Aneurysm can occur anywhere in the body but the two most common places for them to form are in the abdominal aorta and the brain. For this article, I discuss brain aneurysms.

Most brain aneurysms are symptomless and will only cause noticeable symptoms if the vein ruptures. This then triggers a serious condition called a subarachnoid haemorrhage, where the bleeding caused by the ruptured aneurysm can cause extensive brain damage. Symptoms include:

- A sudden and severe headache. Many describe it as being similar to a sudden hit on the head, resulting in an extreme pain unlike anything ever experienced before
- Stiff neck
- Nausea and vomiting

Emergency medical treatment must be called for immediately.

## Causes

Risk factors include hardening and narrowing of the arteries (atherosclerosis), smoking, eating a high-fat diet, not exercising regularly and high blood pressure. Aneurysms tend to run in families. A 2010 study found that 8 out of 10 people who were diagnosed with a brain aneurysm were smokers or had smoked in the past.

## Diagnosis

A CT scan will show up a haemorrhage in 90% of cases. If it does not, a lumbar puncture can be used to confirm diagnosis.

If a CT scan or lumbar puncture show there is bleeding, the exact location of the hemorrhage can be located using a type of X-ray called an angiogram or arteriogram. To highlight the aneurysm, a dye is injected into the bloodstream. The blood in the vessels shows up on the film as white columns. CT scans and lumbar puncture are sometimes used to confirm diagnosis.

Migraine, meningitis and tumours can produce similar side effects to aneurysms so must be considered initially.

## Symptoms

Generally an unruptured brain aneurysm causes no symptoms unless it becomes big or begins to press against tissues or nerves in the brain. Symptoms of an unruptured brain aneurysm may include visual disturbances, pain on one side of the face or around the eye, inability to move some of facial muscles (usually only one side of the face is affected), headaches and seizures

Symptoms of a ruptured brain aneurysm usually begin with a sudden and severe headache. Other symptoms include stiff neck, nausea and vomiting, slurred speech, sensitivity to light, blurred or double vision, confusion or loss of consciousness.

About 10% of those who suffer a ruptured aneurysm die before receiving medical care. If untreated, another 50% will die within a month, with 25% sustaining another bleeding episode within a week. Aside from the bleeding issues, there is significant risk of artery spasm leading to stroke. Early medical treatment increase survival rates significantly.

## **Treatment**

The aim of treatment is to prevent aneurysms from rupturing in the first place. This is usually done with surgery. This involves either strengthening the affected blood vessel with tiny metal coils or sealing it shut with a tiny metal clip. Surgery carries a small risk of causing serious complications. Therefore surgery is only recommended if the potential risk of the aneurysm rupturing outweighs the risks associated with surgery. A number of non-surgical treatments can also be used to reduce the risk of an aneurysm rupturing including cholesterol reducing medication called statins and quitting smoking if a smoker.

Treatment for a brain aneurysm can be split into preventative treatment and emergency treatment. Surgery is usually used as preventative treatment.

### **Preventative surgery**

Two surgical techniques are used to treat brain aneurysms. These are neurosurgical clipping and endovascular coiling. Neurosurgical clipping is carried out under general anaesthetic. A cut is made in scalp where the aneurysm is located, the neurosurgeon will seal it shut using a tiny metal clip.

Endovascular coiling involves inserting a catheter into an artery in the leg or groin. The tube is guided through the network of blood vessels to the brain and finally into the aneurysm. Tiny platinum coils are then passed through the tube into the aneurysm. The coils block the flow of blood into the aneurysm. This seals the aneurysm off from the main artery to prevent it from rupturing.

### **Emergency surgery**

Emergency surgery is similar to preventative surgery. Coils or clipping are used to repair ruptured brain aneurysms. Additional medication and treatments may be used to prevent blood loss and organ damage. For example, nimodipine may be used to prevent ruptured blood vessels going into spasm and causing further blood loss.

**Disclaimer: Please ensure you consult with your healthcare professional before making any changes recommended**

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