What is an Aneurysm in the Brain?

An aneurysm is a weak area in the wall of a blood vessel that causes the blood vessel to bulge or balloon out. When an aneurysm occurs in a blood vessel of the brain, it is called a cerebral aneurysm.

Causes

Aneurysms in the brain occur when there is a weakened area in the wall of a blood vessel. An aneurysm may be present from birth (congenital) or it may develop later in life, such as after a blood vessel is injured.

There are many different types of aneurysms. The most common type is called a berry aneurysm. This type can vary in size from a few millimeters to over a centimeter. Giant berry aneurysms can be bigger than 2 centimeters. These are more common in adults. Multiple berry aneurysms are passed down through families more often than other types of aneurysms.

Other types of cerebral aneurysm involve widening of an entire blood vessel, or they may appear as a "ballooning out" of part of a blood vessel. Such aneurysms can occur in any blood vessel that supplies the brain. Atherosclerosis, trauma, and infection, which can injure the blood vessel wall, can cause cerebral aneurysms.

About 5% of the population has some type of aneurysm in the brain, but only a small number of these aneurysms cause symptoms or rupture. Risk factors include a family history of cerebral aneurysms, and certain medical problems such as polycystic kidney disease, coarctation of the aorta, and endocarditis.

Symptoms

A person may have an aneurysm without having any symptoms. This kind of aneurysm may be found when an MRI or CT scan of the brain is done for another reason.

A cerebral aneurysm may begin to "leak" a small amount of blood. This may cause a severe headache that a patient may describe as "the worst headache of my life." It may be called a thunderclap or sentinel headache. This means the headache could be a warning sign of a rupture days or weeks after the headache first happens.

Symptoms may also occur if the aneurysm pushes on nearby structures in the brain or breaks open (ruptures) and causes bleeding into the brain.

Symptoms depend on the location of the aneurysm, whether it breaks open, and what part of the brain it is pushing on, but they may include:

- Double vision
- Loss of vision
- Headaches
- Eye pain
- Neck pain
- Stiff neck

A sudden, severe headache is one symptom of an aneurysm that has ruptured. Other symptoms of an aneurysm rupture may include:

- Confusion, lethargy, sleepiness, or stupor
- Eyelid drooping
- Headaches with nausea or vomiting
- Muscle weakness or difficulty moving any part of the body
- Numbness or decreased sensation in any part of the body
- Seizures
- Speech impairment
- Stiff neck (occasionally)
- Vision changes (double vision, loss of vision)

NOTE: A ruptured aneurysm is a medical emergency. Call your local emergency number, such as 911.

Exams and Tests

An eye exam may show signs of increased pressure in the brain, including swelling of the optic nerve or bleeding into the retina of the eye. A brain and nervous system exam may show abnormal eye movement, speech, strength, or sensation.

The following tests may be used to diagnose cerebral aneurysm and determine the cause of bleeding in the brain:

- Cerebral angiography or spiral CT scan angiography of the head to reveal the location and size of the aneurysm
- Cerebrospinal fluid exam (spinal tap)
- CT scan of the head
- Electroencephalogram (EEG)
- MRI of the head, or MRI angiogram
- Spinal tap

Treatment

Two common methods are used to repair an aneurysm:

- Clipping is done during open brain surgery (craniotomy).
- Endovascular repair is most often done. It usually involves a "coil" or coiling. This is a less invasive way to treat some aneurysms.

If an aneurysm in the brain ruptures, it is an emergency that needs medical treatment and often requires surgery. Endovascular repair is more often used when this happens.

Even if there are no symptoms, your doctor may order treatment to prevent a future, possibly fatal, rupture.

Not all aneurysms need to be treated right away. Those that are very small (less than 3 mm) are less likely to break open.

Your doctor will help you decide whether it is safer to have surgery to block off the aneurysm before it can break open (rupture).

Someone may be too ill to have surgery, or it may be too dangerous to treat the aneurysm because of its location.

Treatment of a ruptured aneurysm may involve:

- Being admitted to the hospital's intensive care unit (ICU)
- Complete bedrest and activity restrictions
- Drainage of blood from the brain area (cerebral ventricular drainage)
- Drugs to prevent seizures
- Medicines to control headaches and blood pressure
- Medicines through a vein (IV) to prevent infection

Once the aneurysm is repaired, prevention of stroke from a blood vessel spasm may be needed. You may receive medicines through an IV and treatments to prevent high blood pressure.

Outlook (Prognosis)

How well you do depends on many things. Those who are in deep comas after an aneurysm rupture generally do not do as well as those with less severe symptoms.

Ruptured cerebral aneurysms are often deadly. Of those who survive, about 1 in 4 will have some sort of permanent disability.

Possible Complications

- Increased pressure inside the skull
- Loss of movement in one or more parts of the body
- Loss of sensation of any part of the face or body
- Seizures
- Stroke
- Subarachnoid hemorrhage

When to Contact a Medical Professional

Go to the emergency room or call the local emergency number (such as 911) if you have a sudden or severe headache, especially if you also have nausea, vomiting, seizures, or any other neurological symptoms.

Also call if you have a headache that is unusual for you, especially if it is severe or your worst headache ever.

Prevention

There is no known way to prevent the formation of a berry aneurysm. Treating high blood pressure may reduce the chance that an existing aneurysm will rupture. Controlling risk factors for atherosclerosis may reduce the likelihood of some types of aneurysms.

If unruptured aneurysms are discovered in time, they can be treated before causing problems.

The decision to repair an unruptured cerebral aneurysm is based on the size and location of the aneurysm, and the patient's age and general health. The risks involved in both operating and watchful waiting must be carefully considered.