Cerebral Aneurysm

What is a cerebral aneurysm?
A cerebral aneurysm is a bulge in the wall of an artery in the brain. It occurs when there is a weakness in the artery’s wall. The bulge may slowly get bigger over time. It can rupture, or burst, and bleed.
A non-traumatic ruptured cerebral aneurysm is a type of stroke.

What causes an aneurysm?
It is not really clear why some people get aneurysms. Some ideas are:

• A person can be born with a defect or weak area in one of the artery layers.
• As a person ages, bulging occurs from the constant blood flow through the artery. High blood pressure may also cause bulging.
• Trauma can weaken or damage the artery wall.
• Infection can weaken the artery wall.

What does it look like?
Aneurysms come in different shapes and sizes:

• The most common type is a **berry aneurysm**. It is round like a berry and connected to the artery by a stem or neck.

• A **fusiform aneurysm** is spindle-shaped without a neck.

• A **giant aneurysm** is like a berry aneurysm, but it is large, 1¼ inches or 3 centimeters or more in diameter.
**What are the symptoms?**

Symptoms can occur:

- Before the rupture or bleeding
- After the rupture or bleeding

**If Before Rupture or Bleeding**

Most people do not have any symptoms before the rupture or bleeding. Some may have some warning signs. That can happen if the aneurysm is getting bigger or if a small leak occurs. Symptoms can include eye pain, blurred or double vision, or a droopy eyelid.

**If After Rupture or Bleeding**

A person may suddenly have severe symptoms when blood escapes around the brain. These can be a violent headache, changes in wakefulness, vomiting, or seizures. Symptoms can include problems speaking, moving an arm or leg, or face weakness.

**Types of ruptures**

Aneurysm rupture is defined by the location of the bleeding, called a hemorrhage. Bleeding can occur in one or more places:

- **Subarachnoid hemorrhage:** Bleeding into the space that surrounds the surface of the brain and the skull.
- **Intraventricular hemorrhage:** Bleeding into the fluid-filled spaces of the brain, called ventricles.
- **Intracerebral hemorrhage:** Bleeding into the brain tissue.

**How is an aneurysm diagnosed?**

- Information about the person’s **health history** is gathered and a **physical exam** is done.
- A **CT (computerized tomography) scan** is used to find the location and amount of the bleeding. This type of scan uses a series of x-rays taken from different angles with computer processing to create images that have more information than x-rays. It also shows if there is swelling around the bleed area or if the person has had a stroke.
- A **lumbar puncture** is used to look for red blood cells (blood) in the cerebral spinal fluid (CSF).
- A **CT scan angiography** is used to evaluate the blood vessels. This is a CT scan with dye.
- A **cerebral angiogram** is used to study the blood vessels of the brain. It helps to find the location of the aneurysm.
- A **Brain MRI (magnetic resonance imaging) or MRA (magnetic resonance angiography)** is used to show the aneurysm location if it is large enough.
How are cerebral aneurysms treated?

One of the first goals is to fix the cerebral aneurysm to prevent bleeding. The timing and type of treatment will depend on the location and size of the aneurysm and the person's medical condition. Either surgery or endovascular treatment may be offered to repair the aneurysm.

**Surgery**

To get to the aneurysm, the surgeon removes a section of the skull bone in a surgery, called a craniotomy. The surgeon then separates the brain tissue to reach the aneurysm. During the surgery, the aneurysm may be repaired by:

- Placing a clip on the neck of the aneurysm to cut off blood flow into the aneurysm.
- Wrapping the aneurysm wall to prevent bleeding.
- Coating the aneurysm wall with a special plastic or glue to prevent bleeding.

**Endovascular Treatment**

Endovascular treatment repairs the aneurysm from inside the cerebral artery, using the least amount of incisions or cuts. A small plastic tube, called a catheter, is placed into the artery in the groin of the person’s leg. The catheter is moved through the artery into the head and into the aneurysm. From the catheter, one of these treatments may be done:

- **Coiling** - Placing tiny platinum coils inside the aneurysm. These coils block blood flow into the aneurysm to stop the bleeding.
- **A stent** - A wire cage placed over the aneurysm changes blood flow to go over the aneurysm, instead of through it. A stent may also be used to keep coils inside the aneurysm. If a stent is used, the person must be on a mild blood thinner, called Plavix, for at least 6 weeks. Plavix helps prevent clots from forming on the stent until the stent is healed. The person will also need to take a baby aspirin each day for at least 6 months.

**Medical Treatment**

Along with surgery or endovascular treatment, other treatment may include:

- Blood pressure control
- Intravenous (IV) fluids to prevent dehydration
- Pain medicine

**How long will it take to recover?**

Recovery depends on whether or not the aneurysm has bled or ruptured. If the aneurysm has ruptured, recovery will depend on how bad the bleeding is and whether there are any problems. Many people will need long hospital stays and rehabilitation after the rupture of a cerebral aneurysm.
Problems from ruptured cerebral aneurysm

Rebleeding
Rebleeding, or bleeding again, can happen any time before the aneurysm is repaired. The highest risk is in the first 24 hours. However, there is a very high chance the aneurysm will bleed again within 6 months if no treatment is given. People often have worse symptoms if the aneurysm rebleeds.

Cerebral Vasospasm
Vasospasm is a narrowing of the cerebral arteries near the ruptured aneurysm. When the arteries are narrowed, there is less blood flow to the brain tissue. This can cause temporary or permanent loss of brain functions based on the area of brain that is affected.

Hydrocephalus
Blood in the fluid-filled spaces of the brain, called intraventricular or subarachnoid spaces, can block the normal flow of cerebral spinal fluid (CSF). The spaces swell with CSF and put pressure on brain tissue. People may feel sleepier or complain of more headaches.

A CT scan will be done to find hydrocephalus. A tube may be placed to take out some fluid and lessen the pressure, called an external shunt. When the blood reabsorbs, normal CSF flow resumes. A shunt may be needed permanently if the CSF does not begin to circulate normally.

Seizures
Blood that spills over the brain can cause the tissue to become irritated. The irritation can cause sudden uncontrollable electrical changes in normal brain function. People may have twitching of their face, uncontrollable movements of the body, arms or legs, or blackouts. After a seizure, people are often less awake and may be confused. Seizures can be controlled with medicine.

Cognitive Decline
A person’s mental health and behavior may become worse. These may be temporary, but in some cases they are permanent changes.