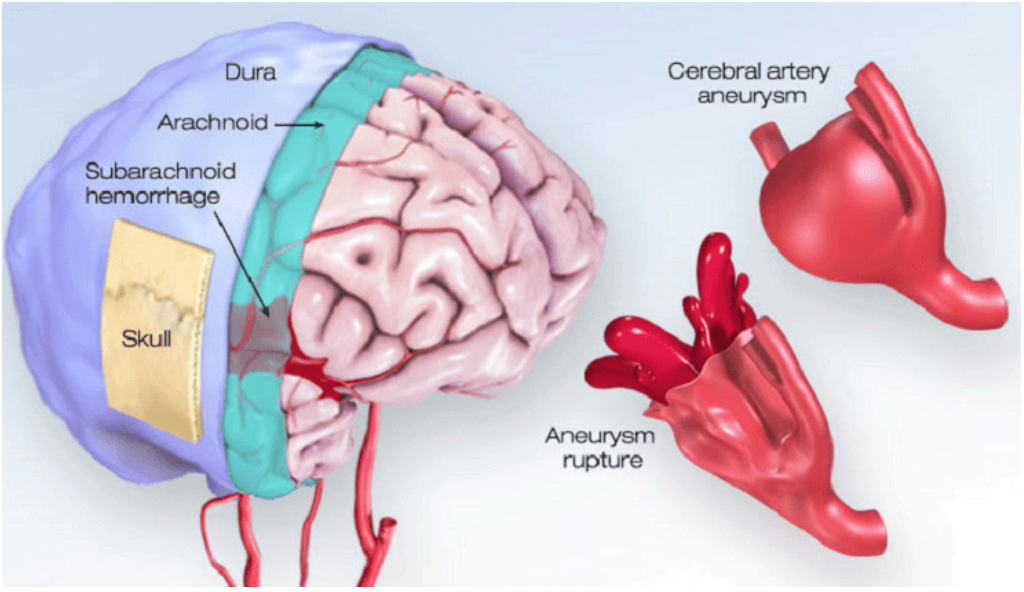
What You Should Know About Cerebral Aneurysms



What is a cerebral aneurysm?

An aneurysm is a weak area in a blood vessel that usually enlarges. It's often described as a "ballooning" of the blood vessel.

How do aneurysms form? Are people born with an aneurysm?

People usually aren't born with aneurysms. Most develop after age 40. Aneurysms usually develop at branching points of arteries and are caused by constant pressure from blood flow. They often enlarge slowly and become weaker as they grow, just as a balloon becomes weaker as it stretches. Aneurysms may be associated with other types of blood vessel disorders, such as fibromuscular dysplasia, cerebral arteritis or arterial dissection, but these are very unusual. Some aneurysms are due to infections, drugs such as amphetamines and cocaine or direct brain trauma from an accident.

How is an aneurysm diagnosed?

Special imaging tests can detect a brain aneurysm. In the CTA (computed tomographic angiography), patients are placed on a table that slides into a CT scanner. A special contrast material (dye) is injected into a vein, and images are

Types of Stroke and Treatment

Ischemic Stroke (Clots) +

Hemorrhagic Stroke +

Transient Ischemic Attack (TIA)

Cryptogenic Stroke

Brain Stem Stroke

Common Diagnosis Methods

Quick Stroke Treatment Can Save Lives +

Finding Clinical Trials

that go to the brain. Contrast is then injected, and pictures are taken of all the blood vessels in the brain. This test is slightly more invasive and less comfortable.

Before any treatment is considered, a diagnostic cerebral angiogram is usually performed to fully map a plan for therapy.

If one aneurysm forms, will others form? Having one aneurysm means there's about a 20 % chance of having one or more other aneurysms.

What are the symptoms of an unruptured aneurysm? Smaller aneurysms usually don't have symptoms. But as an aneurysm enlarges, it can produce headaches or localized pain. If an aneurysm gets very large, it may produce pressure on the normal brain tissue or adjacent nerves. This pressure can cause difficulty with vision, numbness or weakness of an arm or leg, difficulty with memory or speech, or seizures.

What causes an aneurysm to bleed?

We usually don't know why an aneurysm bleeds or exactly when it will bleed. We do know what increases the chance for bleeding:

High blood pressure is the leading cause of subarachnoid hemorrhage. Heavy lifting or straining can cause pressure to rise in the brain and may lead to an aneurysm rupture.

Strong emotions, such as being upset or angry, can raise blood pressure and can subsequently cause aneurysms to rupture.

*Blood thinners (such as warfarin), some medications and prescription drugs (including diet pills that act as stimulants such as ephedrine and amphetamines), and harmful drugs like cocaine can cause aneurysms to rupture and bleed.

What are the chances that an unruptured aneurysm may bleed? Many factors determine whether an aneurysm is likely to bleed. These include the size, shape and location of the aneurysm and symptoms that it causes. Smaller aneurysms that are uniform in size may be less likely to bleed than larger, irregularly shaped ones. Once an aneurysm has bled, there's a very high chance of re-bleeding.

What happens if an aneurysm bleeds? If an aneurysm ruptures, it leaks blood into the space around the brain. This is called a subarachnoid hemorrhage. Depending on the amount of blood, it can produce:

- a sudden severe headache that can last from several hours to days
- nausea and vomiting drowsiness and/or coma

- vision problems
- seizures

What is the usual damage to the brain after an aneurysm bleeds?

Once an aneurysm bleeds, the chance of death is about 40% and the chance of some brain damage is about 66 %, even if the aneurysm is treated. If the aneurysm isn't treated quickly enough, another bleed may occur from the already ruptured aneurysm.

Vasospasm (irritation by the leaked blood causing narrowing of the blood vessels) is a common complication following a ruptured aneurysm. This can lead to further brain damage. Other problems may include hydrocephalus (enlargement of the spaces within the brain that produce cerebrospinal fluid), difficulty breathing that requires a mechanical ventilator, and infection.

Why is the damage so extensive after bleeding? After blood enters the brain and the space around it, direct damage to the brain tissue and brain function results. The amount of damage is usually related to the amount of blood. Damage is due to the increased pressure and swelling from bleeding directly into the brain tissue, or from local cellular damage to brain tissue from irritation of blood in the space between the brain and the skull.

Blood can also irritate and damage the normal blood vessels and cause vasospasm (constriction). This can interrupt normal blood flow to the healthy brain tissue and can cause even more brain damage. This is called an ischemic stroke.

Will treating a ruptured aneurysm reverse or improve brain damage? Once an aneurysm bleeds and brain damage occurs, treating the aneurysm will not reverse the damage. Treatment helps prevent more bleeding.

How is a treatment method for an aneurysm chosen? Doctors must evaluate the risk factors that favor treatment vs. non-treatment and decide which technique may be best. It's important to consult with experts in this field. This should include a cerebrovascular neurosurgeon who specializes in surgically clipping aneurysms, a neurosurgeon with endovascular expertise and training, a neurointerventionalist (a neurologist with endovascular training) or a neuroradiologist who specializes in the less- invasive treatment of cerebral aneurysms by coiling.

How should an aneurysm be treated?

The best treatment depends on many things, including whether the aneurysm has ruptured or not. A ruptured aneurysm usually requires treatment right

What treatments are available?

- Medical therapy. Small, unruptured aneurysms that aren't creating any symptoms may not need treatment unless they grow, trigger symptoms or rupture. It's very important to have annual check-ups to monitor blood pressure, cholesterol and other medical conditions.

- Neurosurgery. Depending on a person's risk factors, open surgery may be recommended. Patients are placed under general anesthesia, and the neurosurgeon places a surgical clip around the base of the aneurysm.

- Neurointerventionalist/neuroradiologist. Depending on the aneurysm's size, location and shape, it may be treatable from inside the blood vessel. This minimally invasive procedure is similar to the cerebral angiogram. However, in addition to taking pictures, a catheter is directed through the blood vessels into the aneurysm itself. Then, using X-ray guidance, the endovascular surgeon carefully places soft platinum micro-coils into the aneurysm and detaches them. The coils stay within the aneurysm and act as a mechanical barrier to blood flow, thus sealing it off

What are the potential complications of aneurysm treatment?

Until the aneurysm is safely and completely treated, there's always the risk it may re-bleed and cause more brain damage. If normal blood vessels are damaged, it could also result in more brain damage.

What follow-up is required after aneurysm treatment? Depending on the type of treatment, the two follow-up procedures are:

- Surgical clipping. After this type of surgery, a post-operative angiogram is usually performed during the hospital stay to make sure the surgical clip has completely treated the aneurysm.

- Neurointerventionalist/neuroradiologist. After coiling an aneurysm, a routine follow-up angiogram is usually performed six to 12 months after the procedure to make sure the aneurysm remains blocked off

* Some medications are commonly called blood thinners because they can help reduce a blood clot from forming. There are three main types of blood thinners that patients commonly take: anticoagulants like warfarin or heparin, antiplatelet drugs like aspirin, and fibrinolytics like tPA (tissue plasminogen activator). Each type of medication has a specific function to prevent a blood clot from forming or causing a blocked blood vessel, heart attack, or stroke.

Last Reviewed: Dec 5, 2018

Stroke Connection E-Newsletter

Connect with our award-winning voice of support to help you, your family and community in the road to recovery.

Subscribe to the Stroke Connection E-Newsletter >

The American Heart Association receives support from pharmaceutical and biotech companies, device manufacturers and health insurance providers whose products may be mentioned in this article. The AHA maintains strict policies preventing supporters from influencing science-based health information. View a list of supporters.