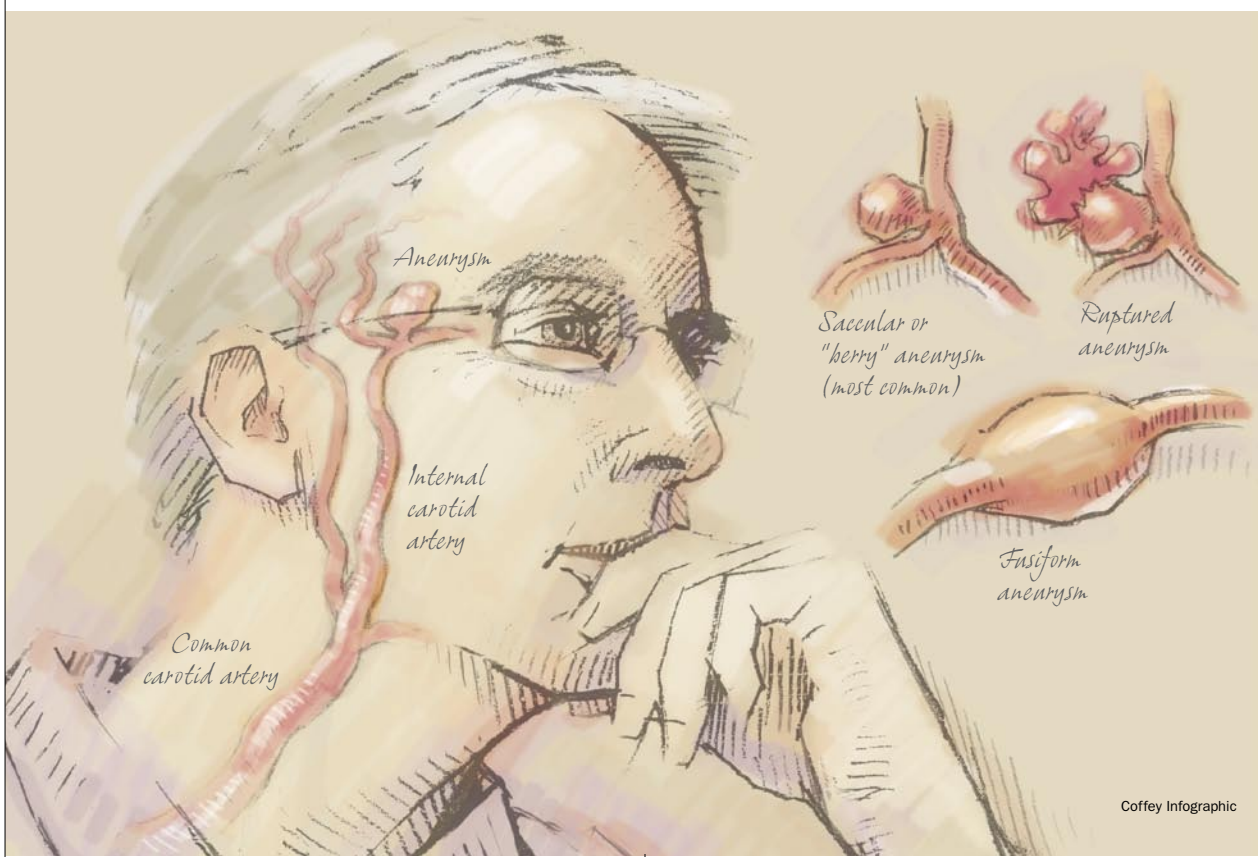

Coffey Infographic

CEREBRAL ANEURYSM

TROUBLE IN THE BRAIN

Blow into a tiny balloon with a forceful breath and you can quickly stretch it to its breaking point.

That simple example shows what can happen when you put something under too much stress, including an artery.

In the case of a cerebral, or brain, aneurysm—one such situation where an artery is under stress—the consequences can be severe.

HIDDEN DANGERS

An aneurysm is a weakened portion of a blood vessel that results in the vessel wall ballooning out and filling with blood. Exactly what causes aneurysms is unknown.

Often brain aneurysms go unrecognized because they rarely produce symptoms unless they rupture.

But sometimes an unruptured aneurysm can put pressure on nerves or brain tissue. Pain above and behind the eye, vision problems, weakness, and dilated pupils are among the signs that an aneurysm may be present, according to the National Institutes of Health.

Brain aneurysms that rupture cause blood to spill into the space around the brain. Symptoms can include sudden, severe headache; nausea and vomiting; stiff neck; sensitivity to light; loss of sensation; and loss of consciousness.

Sadly, many of those whose aneurysms rupture don't survive.

"Twenty to thirty percent of these patients die immediately, without ever getting to a hospital or seeing a doctor," says Jeffrey Thomas, M.D., F.A.C.S., spokesman for the American Association of Neurological Surgeons (AANS).

Of those who do survive, at least half either have significant medical problems or die within 30 days, he says.

EARLY DETECTION IS BEST

The AANS estimates that every year 30,000 Americans have a ruptured brain aneurysm. And up to 6 percent of people in the United States may be living with unruptured aneurysms.

Only about one in five people learns about his or her aneurysm before it ruptures, says Dr. Thomas. Usually it's discovered when the person has an imaging scan of the brain, such as magnetic resonance imaging (MRI), for some unrelated reason.

There's generally no way to know if or when an aneurysm might start to bleed. But people whose aneurysms are found early are lucky, because many of them can be successfully treated, according to Dr. Thomas.

"Now we have such wonderful means at our disposal to cure aneurysms, both neurosurgically and endovascularly, that our success rate just keeps getting better and better," he says.

TWO TREATMENTS

Surgical treatment involves opening the skull and placing a surgical clip at the base of the aneurysm. The clip closes off the weakened part of the vessel, separating it from the main vessel and stopping blood from entering the aneurysm. Normal blood flow remains undisturbed.

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Endovascular therapy involves treating the aneurysm from inside the blood vessel itself, without opening the skull. It can be easier on people than open-skull surgery, but it may have certain disadvantages.

With this treatment, a surgeon first inserts a catheter (a small plastic tube) into an artery in the leg and then guides the catheter up through the body to the aneurysm.

Next, with the help of computerized images, tiny coils made of platinum are threaded through the catheter and released into the aneurysm. This changes the blood flow pattern in the aneurysm, slowing it down and causing clotting.

"What you end up doing is filling the aneurysm with platinum and clot," says Dr. Thomas. "It's effectively like putting a clip across the neck of the aneurysm."

A number of factors, including the person's vascular system and the size and location of an aneurysm, determine which treatment might be safest for the patient.

Someone with very curvy arteries may not be a good candidate for endovascular therapy because it's hard for the catheter to safely reach the aneurysm, says Dr. Thomas. Age and a person's general health also come into play.

Sometimes, such as when an aneurysm is in a very sensitive area of the brain, treatment may not be advisable. And in some cases, doctors may recommend simply watching a small aneurysm to make sure that it doesn't grow.

If treatment is recommended, both surgery and endovascular therapy can be very effective. Less is known about the long-term effects of endovascular treatments, however.

"Microsurgery with clipping has a much longer track record and is still considered the definitive procedure for eliminating aneurysms; they virtually don't come back after they've been correctly clipped," says Dr. Thomas.

"If you have an aneurysm coiled, it's the standard of care today to have imaging tests—especially cerebral angiography—every six months for two years to make sure the coils remain stable and the aneurysm does not refill," he adds. Sometimes, additional coil treatments are needed.

Aneurysms that have ruptured may be treated in the same manner as unruptured aneurysms.

The goal of treatment is to prevent further bleeding.

SCREENING

Although people are not generally screened for aneurysms, there are tests that can spot them—and some people should consider getting them.

"Certainly if you have a family member who's had an aneurysm, that calls for an imaging study," says Dr. Thomas, noting that the tendency to develop aneurysms sometimes runs in families.

To find an aneurysm, doctors can use:

- Computed tomographic angiography. This involves a CT (computed tomography) scan and a special dye that is injected into a vein. The dye makes blood vessels visible.
- Magnetic resonance angiography. This is a special type of MRI that produces detailed images of blood vessels.
- Cerebral angiogram. This uses dye and x-rays but is somewhat more invasive than the above tests, according to the American Stroke Association.

Your doctor will decide which test is best for you.

To learn more, visit the AANS patient Web site, *www.neurosurgerytoday.org*.

Are you AT RISK for an aneurysm?

EXACTLY WHAT CAUSES an aneurysm to form isn't known at this point.

But certain factors may put you at increased risk. These include:

- Smoking.
- Alcohol and drug use.
- High blood pressure.
- Use of oral contraceptives.
- Traumatic head injury.
- Complications from some types of blood infections.
- Family history of brain aneurysms.

Certain inherited disorders—such as polycystic kidney disease, Marfan syndrome and Ehlers-Danlos syndrome—are also believed to raise your risk, says the Brain Aneurysm Foundation.

If you have one of these conditions or any of the risk factors described above, talk to your doctor about the possibility of having a screening test.

When an aneurysm is found before it ruptures, it can often be successfully treated.