

# BARROW

A Magazine for the Friends of Barrow Neurological Institute of St. Joseph's Hospital and Medical Center

## Endovascular Neurosurgery

**Barrow neurosurgeons are working from inside the brain's blood vessels to treat formerly inoperable conditions**

Pedro Ampuero remembers that day in February 2000 as though it were yesterday. The 62-year-old Phoenix man was sitting at his computer when one eye began burning. He struggled to stand up, but his entire left side was lifeless. Terrified and unable to speak clearly, he banged his hand against the wall until his wife and daughter came to his rescue.

Five minutes later, as Pedro prepared to go to the hospital, his symptoms vanished.

At the hospital, emergency specialists could find nothing wrong, so Pedro made an appointment with a neurologist. The neurologist ordered an MRI and found the cause of Pedro's episode: two blocked arteries near the vertebral-basilar junction in the back of the brain. Pedro had had a transient ischemic attack (TIA), a kind of mini-stroke that occurs when blood flow to a part of the brain is momentarily blocked.

Unfortunately, the neurologist told him, there was nothing that could be done. One of the arteries was completely blocked, and the other was 80 percent blocked. Unlike a carotid artery, which can be reached easily because of its location in the neck, these arteries were buried too deep in the brain to be reached by traditional neurosurgery.

Two weeks later, Pedro had a second TIA. Soon he was having several a day, despite medication. In desperation, Pedro made an appointment with a second neurologist, who concurred with the first. This doctor, however, referred him to Cameron McDougall, M.D., at Barrow, who along with Felipe Albuquerque, M.D., specializes in endovascular neurosurgery.

"Endo" means "within", and "vascular" refers to the body's system of blood vessels. Endovascular neurosurgery, also called interventional neuroradiology, is a minimally invasive type of surgery that is performed through the blood vessels. It does not require an opening in the skull, as traditional brain surgery does.

Working in an angiography suite, the surgeon threads a thin, flexible tube called a catheter into an artery, usually at the groin. Then, using x-rays to see the location of the catheter, the surgeon guides it through the blood vessels to the artery where treatment is needed. Coils and glues can then be delivered through the catheter to block blood flow to aneurysms and other abnormalities, and balloons and stents can be used to open up clogged arteries. Because endovascular neurosurgery is less invasive than open surgery, patients recover faster and have fewer scars. Endovascular neurosurgery is often used in conjunction with open surgery and, most importantly, is sometimes appropriate for conditions that otherwise cannot be treated.

After reviewing Pedro's images and history, Dr. McDougall recommended endovascular neurosurgery to open up and stabilize the artery that was not yet totally blocked.

"Pedro's symptoms were terrible, and he really had no other alternatives," says Dr. McDougall. "His risk of stroke and death from that lesion was very, very high."

Some endovascular procedures, such as Pedro's, are so new that they are not yet Medicare approved. Fortunately, Pedro's insurance company was willing to cover the procedure, which was performed on July 3, 2000.

Dr. McDougall used a balloon attached to the catheter to open up the restricted artery and then maneuvered a cylinder made of metal mesh (called a stent) into place. The stent would hold the artery walls open, restoring blood flow.

"All the symptoms went away, and from that point on, I haven't had any more," says Pedro, who left the hospital the following day. "This procedure has done wonders for me."

Pedro has returned to work at Southwest Airlines. His third grandchild - a girl named Sydney - was born a year after the procedure. "It's been a love affair with her," says the proud grandfather.

This is an exciting time for endovascular neurosurgery, says Dr. McDougall. Medical-device companies are developing specialized stents, coils and glues for use in the brain. Barrow will soon be involved in a clinical trial of a coil coated with a material that promotes scar-tissue formation.

"Ten years ago we had none of this. So much has happened that it may not be recognizable in another 10 years," Dr. McDougall says.

## **Supporting Barrow**

Donors fund research into endovascular neurosurgery Funds from the Women's Board and Barrow Neurological Foundation are supporting research into endovascular neurosurgery, an innovative new area of brain surgery. Neurosurgeons Cameron McDougall, M.D., and Felipe Albuquerque, M.D., are involved in a number of research projects to develop new endovascular techniques and tools.

Endovascular neurosurgery uses small catheters passed through blood vessels to access target areas in the brain. These minimally invasive procedures do not require opening the skull and can be used to treat aneurysms, arteriovenous malformations, blocked arteries, dural fistulas and brain tumors. With two specially trained endovascular neurosurgeons on staff, Barrow performs more of this type of surgery than any other Arizona hospital.