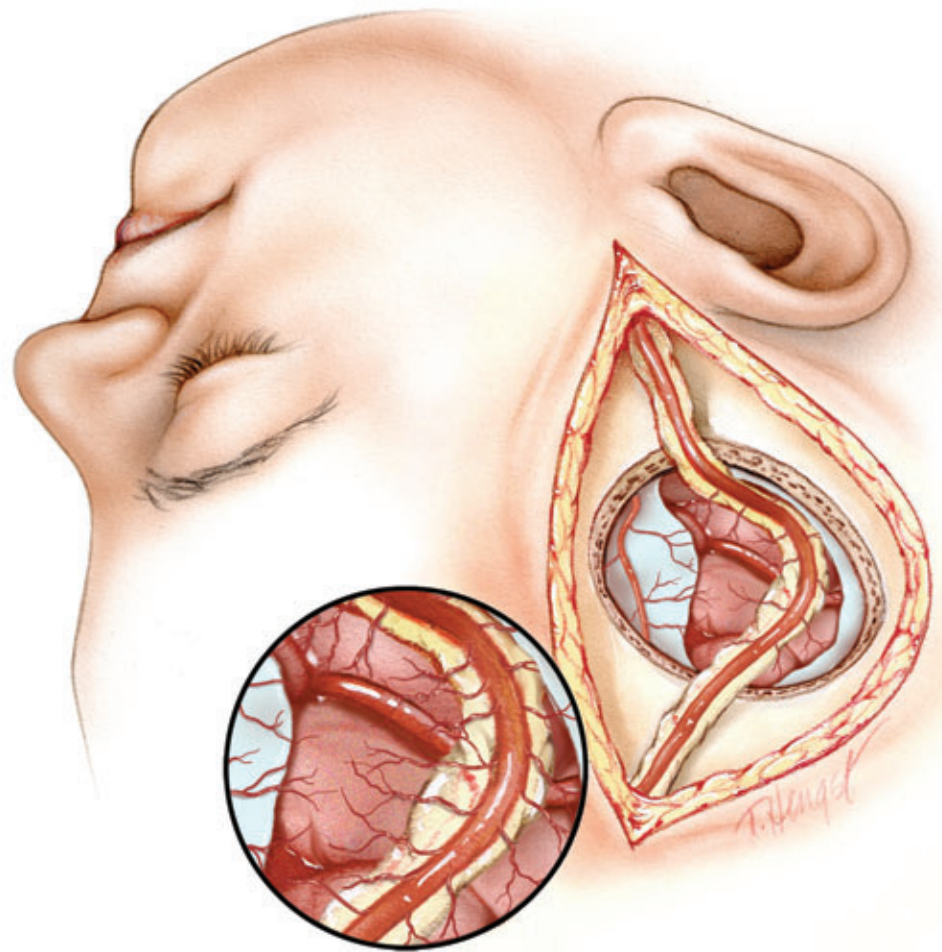


Dr. Nestor R. Gonzalez is refining a procedure called encephalo-duro-arteriosynangiosis (EDAS) surgery to treat patients with progressive narrowing of their brain arteries. EDAS (right) reroutes vessels that feed the scalp through a hole cut in the skull to create new connections between them and the brain tissue.



## Specialists Use Surgical and Endovascular Techniques

to Improve Care for Cerebrovascular Patients

Surgeons can now combine conventional surgical techniques with modern endovascular intra-arterial and intra-venous approaches to treat challenging brain lesions.

Mechanical retrievers have improved the treatment of stroke by enabling physicians to open arteries from the inside without medications or tools that may potentially increase complications, and have provided an expanded window of time to treat patients.

In the past, cerebrovascular conditions such as stroke and cerebral aneurysms were treated almost exclusively with surgical techniques that required a craniotomy. Today's latest neurovascular techniques, however, chart smarter, and less risky, pathways to treat problems in hard-to-reach areas of the brain.

"We are radically changing the history of how we treat problems of the brain," says UCLA neurosurgeon Nestor R. Gonzalez, MD, who was one of the first surgeons in the country to receive complex training in neurosurgery and interventional radiology that enables him to perform both neurosurgery and endovascular

neurosurgery. "We now combine conventional surgical techniques with modern endovascular intra-arterial and intra-venous approaches to effectively treat brain lesions that were previously challenging and resulted in less favorable outcomes."

For example, endovascular coiling is a minimally invasive catheter-based procedure that blocks blood flow to a weakened artery wall in the brain (cerebral aneurysm) to prevent the aneurysm from rupturing. According to Dr. Gonzalez, endovascular coiling is now the dominant form of treatment for aneurysms around the world.

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“Several clinical trials have now shown that the coiling technique ...has excellent outcomes that are superior, in some cases, to craniotomy for treatment of cerebral aneurysms.”

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“Several clinical trials have now shown that the coiling technique, when used appropriately, has excellent outcomes that are superior, in some cases, to craniotomy for treatment of cerebral aneurysms,” he says. The procedure may also be used, in combination with surgical resection and radiation, to treat arteriovenous malformations (AVMs), which are abnormal connections between the arteries and veins of the brain. AVMs occur in less than 1 percent of the U.S. population, but may cause life-threatening intracranial bleeding in more than 50 percent of affected patients.

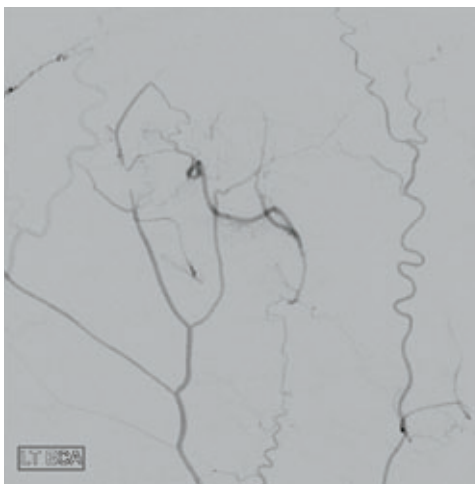
More recently, endovascular techniques are being used to treat strokes — the third leading cause of death in the U.S. UCLA interventional radiologists invented the first FDA-approved medical tool, the Mechanical Embolus Removal in Cerebral Ischemia, or MERCI device, to remove blood clots from the brain in patients experiencing an ischemic stroke. Until a few years ago, it was possible to treat ischemic stroke only with clot-busting medications that had to be administered within a few hours from initial onset of the event.

“MERCI has improved the treatment of stroke in two major ways,” Dr. Gonzalez explains. “Thanks to that development, we can now open arteries from the inside without medications or tools that may potentially increase complications, and we have an expanded window of time to treat patients. Rather than having only a few hours, we now can effectively treat stroke patients using mechanical devices from six to as many as 12 hours after onset of ischemic stroke symptoms.”

For Dr. Gonzalez, the next frontier is developing surgical techniques to prevent strokes. In a procedure called encephalo-duro-arteriosynangiosis (EDAS) surgery, he reroutes healthy arteries located below the ear and places them in close proximity to narrowed arteries in other areas of the brain. Over time, the rerouted arteries will grow, form new connections with nearby brain tissue and increase blood flow to diseased areas, Dr. Gonzalez explains. To date, he has performed the procedure in more than a 100 patients at UCLA, with good results and few complications. He received the American Heart Association 2012 Innovation Award in Stroke Research for his work in this area.

Over the next 10 years, Dr. Gonzalez anticipates that stroke research will focus on identifying methods to expand treatment for acute stroke patients, including methods of neuroprotection to improve the body’s resistance to stroke, and on advancing stem cell research in the area of brain tissue repair. The goal is to prevent both new and recurrent strokes. Approximately 25 percent of people who recover from their first stroke will have another one within five years.

“We’re happy to evaluate all patients in the UCLA Stroke Center, even those whose risk factors have already been treated,” Dr. Gonzalez says. “We’re available 24-7 with a complete spectrum of services. Every day, we make new discoveries and our patients are an important part of developing innovative techniques that will save lives in the future.”



Following encephalo-duro-arteriosynangiosis (EDAS) surgery, an angiogram (left) shows branches of the superficial scalp arteries growing to provide increased blood flow to intracranial arteries. The growth pattern (right) of these new vessels resembles the tendrils of a vine.