



The Neuroscience Institute

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The Neuroscience Institute at UC & University Hospital Emerges as leader in treating moyamoya disease

***Mayfield Clinic neurosurgeon Mario Zuccarello, M.D.,
Offers hope to at-risk patients through microsurgical cranial bypass***

CINCINNATI – The Neuroscience Institute at the University of Cincinnati (UC) and University Hospital is emerging as an important treatment center for patients suffering from moyamoya disease. Moyamoya, a rare brain disorder, is characterized by chronic and progressive narrowing of the carotid arteries in the brain. It can lead to debilitating strokes and seizures in adults and children.

To compensate for the narrowing arteries, the brain creates collateral blood vessels in an attempt to facilitate the flow of oxygen-rich blood. These tiny collateral vessels, when seen on a brain scan, have a hazy, filmy appearance, like a puff of smoke. The Japanese, who were the first to describe the condition, named it “moyamoya,” their term for “puff of smoke.”

Mario Zuccarello, M.D., a neurosurgeon with The Neuroscience Institute and the Mayfield Clinic, has surgically treated 25 patients with moyamoya during the last five years.

“We are seeing more patients with moyamoya because patients and physicians are starting to recognize the disease more frequently and because the treatment, which requires highly specialized microvascular techniques, is available here at The Neuroscience Institute,” Dr. Zuccarello said.

The treatment, which is not widely offered, involves surgically bypassing the occlusion. In the most delicate and technically challenging bypass procedure, called an extracranial-intracranial bypass, the surgeon connects the superficial temporal artery (STA) from the scalp outside the skull to the middle cerebral artery (MCA) inside the skull. The procedure requires microdissection of the two arteries and subsequent attachment with microvascular sutures.

Although most prevalent in Japan, moyamoya disease has been diagnosed in people throughout the world. In Japan, approximately three individuals in 100,000 are affected by moyamoya. In the United States, the risk of developing moyamoya is less than one in 100,000. Moyamoya has been associated with 6 percent of childhood strokes.

In children, symptoms of moyamoya are most likely to first appear with an ischemic stroke or mini-stroke, also known as a transient ischemic attack, or TIA. During an ischemic stroke or TIA, a blockage interrupts the flow of oxygen-carrying blood to the brain. In adults, the disease can first appear with an ischemic stroke or TIA or with a hemorrhagic (bleeding) stroke.

“Moyamoya disease should be considered and diagnostic evaluation begun in any patient who experiences symptoms of cerebral ischemia,” Dr. Zuccarello said. Symptoms of ischemia include episodes of muscle weakness or partial paralysis on one side of the body, speech disturbance, sensory impairment, involuntary movement, and/or visual impairment.

The presence of moyamoya is confirmed by a series of imaging studies that can reveal the characteristic arterial narrowing and collateral blood vessels that have the appearance of a “puff of smoke.” Imaging also can reveal evidence of multiple small strokes. Doctors can usually make a diagnosis of moyamoya if MRI images show 1) diminished blood flow in the internal carotid and middle and anterior cerebral arteries and 2) prominent collateral blood flow at the base of the brain. To confirm the diagnosis of moyamoya disease, conventional cerebral angiography is typically required.

The Mayfield Clinic is recognized as one of the nation's leading physician organizations for clinical care, education, and research of the spine and brain. The group includes 20 neurosurgeons and treats 20,000 patients from 35 states and a dozen countries in a typical year. Mayfield's neurosurgeons are active participants in important clinical trials and have pioneered surgical procedures and instrumentation that have revolutionized the medical art of neurosurgery for brain tumors and neurovascular diseases and disorders.

The Neuroscience Institute, a regional center of excellence at UC and University Hospital, is dedicated to patient care, research, education, and the development of new treatments for stroke, brain and spinal tumors, epilepsy, traumatic brain and spinal injury, Alzheimer's disease, Parkinson's disease, disorders of the senses (swallowing, voice, hearing, pain, taste and smell), and psychiatric conditions (bipolar disorder, schizophrenia and depression).

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