Neurological Surgery
UHealth UNIVERSITY OF MIAMI HEALTH SYSTEM
UNIVERSITY OF MIAMI MILLER SCHOOL of MEDICINE
Jackson MEMORIAL HOSPITAL
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NeuroFocus

FALL 2014

A newsletter from the Departments of Neurology and Neurological Surgery at the University of Miami Miller School of Medicine in affiliation with Jackson Memorial Hospital

A 2-inch aneurysm in the brain is not a death sentence. Susan McGowen knows it.

Jacques J. Morcos, M.D., F.R.C.S., professor of clinical neurological surgery and otolaryngology at the University of Miami Miller School of Medicine, is one of the few physicians in the United States who can treat patients with complex brain aneurysms with a cerebral artery bypass. Dr. Morcos is director of cerebrovascular surgery as well as director of skull base, endoscopic, and pituitary tumor surgery at the University of Miami Hospital and Jackson Memorial Hospital. Susan McGowen is a recent patient of Dr. Morcos who had a successful outcome. She was diagnosed with a 2-inch aneurysm on the left side of her brain.

In 2008, McGowen, a 53-year-old resident of Sarasota, Fla., began experiencing phantom odors, often smelling the scent of bacon and smoke in her home. When she asked her physician about this, the doctor ordered an x-ray of her sinuses, followed by an MRI. The scan determined she had a 2.5 centimeter brain aneurysm. An angiogram revealed that it was a partially thrombosed giant aneurysm of the main artery that feeds the left side of the brain, the middle cerebral artery. Because it was judged to be untreatable by coiling or stenting, and because her consulting neurosurgeon considered open surgery to be too risky, she was simply monitored.

Jacques J. Morcos, M.D., F.R.C.S.
Professor of Neurosurgery

Susan, now celebrating life

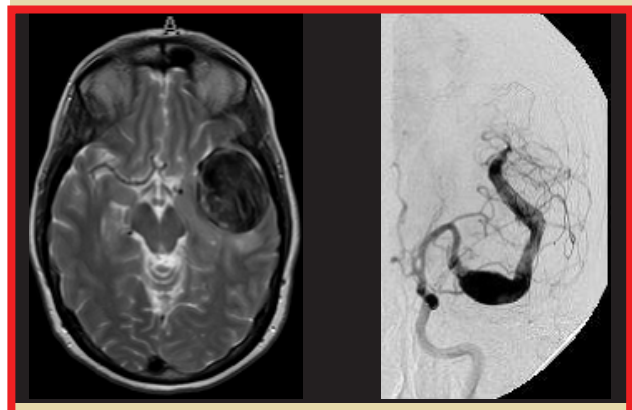
In 2011, Susan began suffering from constant headaches and shooting pains in her neck and head, followed by problems finding the right words to use while speaking. She also, for the first time, had a full blown seizure. After seeing two new neurosurgeons, including a specialist at another tertiary medical center in Florida, McGowen was told her aneurysm had doubled in size.

"The aneurysm had grown to the size of a large egg," McGowen said. "Realizing how huge it was and that it could rupture at any second was the hardest part." In December 2011, McGowen was referred by her local neurosurgeon to Dr. Morcos, who decided to do a bypass procedure to remove the aneurysm from her circulation. The eight hour surgery took place at Jackson Memorial Hospital.

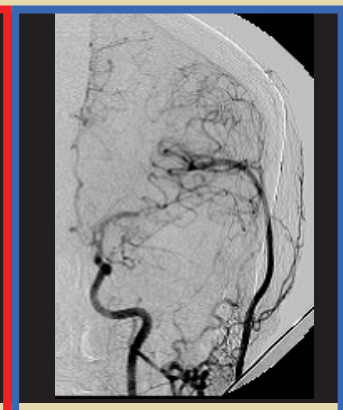
"This was her only chance," Dr. Morcos said. "The aneurysm could not be clipped, and she was not a candidate for coiling or any of the newer endovascular aneurysm treatments, such as stents or flow diversion devices."

During this complicated surgery, which is only performed at a few medical centers in the United States, the radial artery was removed from McGowen's arm. Dr. Morcos then implanted the vessel into her neck, tunneled it under her skin, and sutured the other end to the middle cerebral artery of the brain. This gave her essentially a new healthy artery, which allowed Dr. Morcos to open the aneurysm, empty the large amount of clot that it contained, and trap it between clips, curing it permanently. An angiogram determined that the aneurysm had been completely cured and that the bypass was working perfectly.

Two days after the surgery, McGowen began walking. She was discharged a week after surgery, with no side effects from the brain surgery. She has since resumed her usual activities – working as a bookkeeper for her family business, quilting and helping care for her five grandsons. "The peace of mind that patients gain, after their complex aneurysm is totally and permanently cured with this procedure, compared to most endovascular techniques, is simply priceless. In addition to aneurysms, we also use bypass surgery to treat patients with strokes, carotid occlusion, Moyamoya disease, and complex tumors of the base of the skull", Dr Morcos said.



Pre-op MRI and Angiogram



Post-op Angiogram

Susan credits Dr. Morcos and the medical team at Jackson Memorial Hospital for saving her life. ■

WHAT'S INSIDE

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Sparking Change and Advancing Neuroscience

with MR Guided Laser Ablation for Epilepsy

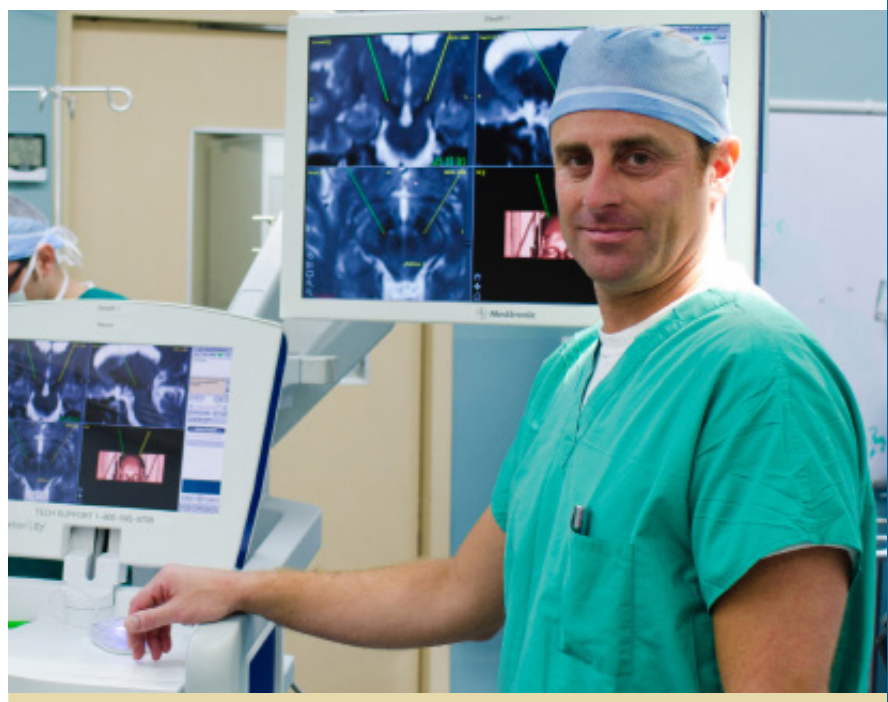
Epilepsy is a relatively common disorder of the brain affecting 3 percent of the population in the United States by the age of 80. In approximately 30 to 40 percent of patients with epilepsy, the seizure disorder fails to remit to pharmacologic treatment with antiepileptic medication. In the case of treatment-resistant epilepsy, surgical removal of the area of the brain where the epileptic activity originates has resulted in a cure or significant improvement in the epilepsy of up to 60 to 70 percent of these patients.

The majority of surgical procedures in epilepsy surgery consist of removal of certain structures of the brain in the temporal lobe, known as amygdala and hippocampus. The traditional surgical procedure requires a craniotomy (opening of the skull) which allows exposure of the temporal lobe structures that are then removed under the guide of a microscope.

In the last two years, a new technique has been developed, which is based on the destruction of the amygdala and hippocampus with the use of laser, known as Visualase. The laser is delivered through a probe inserted in the brain and its placement is guided by MRI. In this unique surgery, a small laser probe, about the size of the lead in a pencil, is inserted through a small incision in the skull. Light energy is precisely delivered through the probe into the target lesion causing temperatures in the target lesion to rise and thereby irreversibly destroying unwanted tissue in seconds. The Visualase software interfaces with the MRI magnet to generate temperature maps, enabling the physician to precisely monitor and control the extent of tissue coagulation in real time. The physician is able to set temperature safety points around critical structures in the brain, and if triggered, the laser will shut off immediately protecting those structures. Once the unwanted tissue is destroyed, the probe is removed and the incision is closed with a single stitch. Most patients are sent home within 24 to 48 hours and are able to resume normal activity within the first seven days. Additionally, the use of this technology does not limit the use of conjunctive therapies or alternative treatments.

The team at Comprehensive Epilepsy Center the University of Miami Miller School of Medicine has incorporated this surgical procedure into its surgical armamentarium in the last eight months. To date, 14 patients have undergone this procedure which is performed by Jonathan J. Jagid, M.D., associate professor of neurosurgery. All of the patients were treated at Jackson Memorial Hospital and discharged within the first two days after the surgical procedure and were able to resume their activities after a week. Furthermore, this procedure has allowed the epileptologists at the center to offer this treatment to four patients with intractable temporal lobe epilepsy who were older than 55.

This procedure can also be used to destroy abnormal lesions in the brain that generate seizure activity, known as focal displasias, which may be located within or outside of the temporal lobe. Together with the standard temporal lobectomies, this new procedure is placing the Comprehensive Epilepsy Center University of Miami's among major surgical centers that can offer a variety of surgical procedures for the relief of such a devastating disease.



Jonathan J. Jagid, M.D.
Associate Professor of Clinical Neurological Surgery, Neurology, Orthopaedics & Rehabilitation, Director, Functional Neurosurgery
CoDirector, Neurotrauma

UM/Jackson neuro-endovascular team

completes first U.S. intra-arterial stem cell

From left to right - Amanda Torres, M.S., Senior Research Assistant, Dr. Dileep R. Yavagal, M.D., Director of Interventional Neurology, Ryan Pafford, M.S., Senior Research Assistant, Kevin N. Ramdas, M.D., Research Physician

On April 16, 2014, months of preparation and logistical effort combined with years of research culminated in the first ever U.S. Intra-Arterial delivery of stem cells for a chronic persistent vegetative state (PVS) patient on a compassionate use basis approved by the FDA. Dileep R. Yavagal, M.D., Director of Interventional Neurology led this effort with his research team of Diogo Haussen, M.D., fellow, endovascular surgical neuroradiology, Keith DeSousa, M.D., fellow, vascular neurology, Kevin N. Ramdas, M.D., Research Physician and Ryan Pafford, Senior research assistant.

Kester Nedd, M.D., a neurologist at Jackson Memorial Hospital, first presented the patient to Dr. Yavagal in early 2013. The patient is a young female who suffered extensive brain damage from lack of blood flow to the brain due to cardiac arrest and is currently in a PVS. This event occurred in her hometown of Panama, City, Panama in 2011. Despite two years of intense rehabilitation, she did not show any improvement. The FDA approved this use of groundbreaking, cutting-edge stem cell therapy for a subject that has exhausted all forms of medical intervention. Stem cells show tremendous promise, in stroke recovery in laboratory studies in the Dr. Yavagal's lab at the University of Miami Miller School of Medicine and other labs worldwide. Laboratory studies also show that stem cells may help diffuse brain injury from lack of blood in flow seen in patients with PVS.

Adult bone marrow derived cells have been investigated as possible sources for regenerating damaged heart tissue. Laboratory studies also demonstrated that treatment with human mesenchymal stromal cells (hMSCs) improved neurologic function and markedly reduced ischemic brain damage that is a common consequence of cardiac

A collaborative network

to advance stroke prevention, treatment and recovery clinical trials.

The Miami Regional Coordinating Center (RCC) for the NIH StrokeNet Trials Network at the University of Miami is one of the 25 sites awarded by the NIH/ NINDS to conduct stroke-related clinical trials in the USA. It encompasses a wide regional network in South Florida, the most populous metropolitan area in the Southeast which is a diverse and unique population. It includes acute care, pediatric, and rehabilitation hospitals that leverage academic, private, and community partnerships.

Collaborating institutions include the University of Miami Hospital, Jackson Memorial Hospital, Jackson Rehabilitation Hospital, Holtz Children's Hospital, Miami VA Hospital, Miami Children's Hospital, Baptist of South Florida, and JFK Hospital/JEM Research, Inc.

Our experience participating in clinical trials, multidisciplinary teams with stroke neurology, emergency medicine, neurosurgery, neuro-interventional, neuro-critical care, neuro-rehabilitation, and neuro-pediatric capabilities, along with close integration with EMS, provides our patients with the opportunity to participate in diverse, cutting-edge clinical studies. We are committed to training the next generation of stroke researchers through robust mentorship and a wide range of training programs and didactic opportunities. Unique resources that strengthen the StrokeNet include preclinical stroke laboratories, programs in stem cells, human genetics, biorepository, a brain bank, and a health disparities-focused CTSI. With these assets, the Miami RCC contributes to the rapid development of novel interventions for treatment, prevention, and recovery of stroke patients.

arrest. Studies conducted at the University of Miami also demonstrated that the marrow-isolated adult multilineage-inducible cells protect the brain from ischemic injury in a rat model of cardiac arrest. A study demonstrated that hMSCs injected into the brain of adult mice 1 day after ischemia improved neurologic function and markedly decreased neuronal cell death of the brain. On the other hand, our study demonstrated that the marrow-isolated adult multilineage-inducible cells injection into the brain of adult rats protects neurons from global cerebral ischemic injury. In the aforementioned studies, the cells were transplanted directly into the brain, at the site of injury. In contrast, it has been documented that the intra-arterial (IA) delivery of stem cells results in a higher proportion of injected cells reaching the brain as compared to the intravenous route and more appealing then delivering the cells directly into the brain. This has been explored in mouse or rat models and some larger animal models such as pigs. Studies have also been carried out in humans, usually in patients who are undergoing open-heart surgery. Several of these have demonstrated that stem cells that are injected into the circulation or directly into the injured heart tissue appear to improve cardiac function and/or induce the formation of new capillaries. Aldagen, Inc., has translated this cardiac model to the brain in acute stroke. Aldagen has used stem cells to treat brain injury acutely post-stroke but not quite this late post stroke. However, the data from the research that Aldagen, Inc. has produced has shown significant repair in brain injury.

Our Patient was brought to Jackson Memorial Hospital and first underwent a bone marrow aspiration where bone marrow was collected from the hip joint. This marrow was taken via air courier to the Aldagen, Inc. laboratories in North Carolina, processed and the ALD-401 cells returned to us 48 hours later.

The ALD-401 delivery occurred via catheter infusion to bilateral internal carotid arteries in the same setting as one procedure. Under local anesthesia a thin flexible catheter was inserted into the femoral artery via a groin puncture entry. The tip of the catheter was guided to the arch of the aorta into the left common carotid artery and then into the left internal carotid artery to the area of ophthalmic branch where the product was delivered.

The tip of the catheter was then withdrawn back to the arch of the aorta and retracted back into the brachiocephalic trunk and into the right common carotid artery and continuing into the right internal carotid artery where the catheter was then guided back up to the same location as it was on the left ICA for the second half of the product delivery.

The infusion was optimally targeted to be within the internal carotid artery (ICA), beyond the origin of the ophthalmic artery and prior to the first branch of the Middle Cerebral Artery (M1 branch).

Since the infusion, the patient has done well , and we will continue our routine monitoring, per FDA requirement for one year. To date no adverse reactions that are serious, unexpected or associated with the use of the product have been reported. At the conclusion of treatment Dr. Dileep R. Yavagal, MD and Aldagen, Inc. will provide the FDA with a written summary of the results of the expanded access use. ■

Want more? Check out these stories online and discover more about the University of Miami Miller School of Medicine and Jackson Memorial Hospital

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NeuroFocus

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New Faculty

From left to right-Barry Baumel, M.D., Edward Bass, M.D., Negar Asdaghi, M.D., Amer Malik, M.D., M.B.A., and Gustavo Rey, Ph.D.

A major focus of the Department of Neurology has been to expand the practice Neurology specialists to your community. We now have clinics in Hialeah, Boca Raton, Plantation, and Kendall. University of Miami Hospital, Jackson Memorial Hospital, University of Miami Hospital and Clinics, our Sleep Lab at Bascom Palmer Eye Institute along with our main clinic in the Professional Arts Building in the Miami Health District are all aimed at providing convenient world-class neurological care.

We are also adding new physicians to the neurology team in order to see all patients in a more timely manner. In 2014, Edward Bass, M.D. joined to expand the general neurology practice, Amer Malik, M.D., M.B.A., and Negar Asdaghi, M.D., joined to expand stroke services, and Barry Baumel, M.D. and Gustavo Rey Ph.D. joined to expand our memory and alzheimer clinical trials and neuropsychology programs. Macarena De La Fuente, M.D. has joined to expand neuro-oncology and Alyssa Pensirikul, M.D. has joined to expand the pediatric neurology division.

Sara Jernigan, M.D.
Assistant Professor of Clinical Pediatric Neurological Surgery

Sarah Jernigan, M.D., is the newest addition to the University of Miami Miller School of Medicine's Department of Neurosurgery/Division of Pediatric Neurosurgery. She earned her medical degree at the University of Louisville, and completed her residency in neurological surgery at Brigham Women's Hospital and went on to complete her fellowship in pediatric neurological surgery at Boston Children's Hospital, Harvard Medical School.

Dr. Jernigan's medical interests include the treatment and care of complex congenital neurosurgery patients with conditions such as spina bifida and hydrocephalus. Dr. Jernigan joins the pediatric neurosurgical team of Dr. John Ragheb, Dr. Sanjiv Bhatia and Dr. Toba Niazi. She will practice out of at Holtz Children's Hospital at the University of Miami/Jackson Memorial Medical Center.

Practice Specialties:

- Traumatic brain injuries
- Concussions
- Vascular anomalies, Moyamoya
- Brain and spinal tumors
- Spina bifida
- Hydrocephalus

2014-2015
Residency and Fellowship Class

Having the second largest neurology residency in the country, the department, welcomed a new class of PGY1's ; Mark Armanious, Kunakorn Atchaneeyasakul, Renata Chalfin, Diego Condés Diez Martinez, Ye Hu, Lisl Huffaker, Christopher Jimenez, and Manuel Melo Bicchi. Aleksey Androsov, Melissa Fellman, and Rajiv Singh joined the program as PGY2's.

We also welcomed 15 fellows. Sushrut Dharmadhikari, Priyank Khandelwal, and Vikas Pandey will be vascular fellows; Jean Sun, Victor A Velez-Aldahondo, and Denys Shapovalov will be working in neurophysiology; Susan Gallardo will be working with neuromuscular; Joshuae Gallardo with Epilepsy; Desiree Garcia, Lin Dagmar and Edgar Mercado with sleep medicine; and Aleksandr Shikhman will be with neuro care.

We are also pleased that Juan Perez-Barcena, Indira De Jesus, and George Selas are returning for a second year fellowship in Neuro Critical Care.

The Neurosurgery Department is proud to have matched three of the top most competetive resident interns in the country - Drs. Stephen Burks, Iahn Cajigas and Ashish Shah.

We also welcomed seven fellows this year - Dr. Sudheer Ambekar, who will be doing an endovascular fellowship, under the mentorships of Drs. Elhammady and Peterson. Dr. Zachary Hickman, will be doing a neuro-trauma fellowship, under the mentorships of Drs. Bullock and Jagid. Dr. Michael Ivan, will be completing a neuro-oncology fellowship at the University of Miami Hospital, under the leadership of Drs. Heros and Komotar. Dr. Levi head's-up the Spine program and along with the rest of the spine faculty they will be mentoring Drs. Ian Côté and Luis Romero who will be completing a spine fellowship. Dr. Aria Fallah will be completing a pediatric fellowship at Miami Children's Hospital under the direction of Dr. Ragheb and the Pediatric faculty. Dr. Anthony Wang will be in doing a cerebrovascular, skullbase fellowship, under the mentorship of Drs. Heros and Morcos.