



Medical College of Georgia

Neuroscience Outlook

Department of Neurosurgery Newsletter

Volume 1, Issue 3 - Summer 2005

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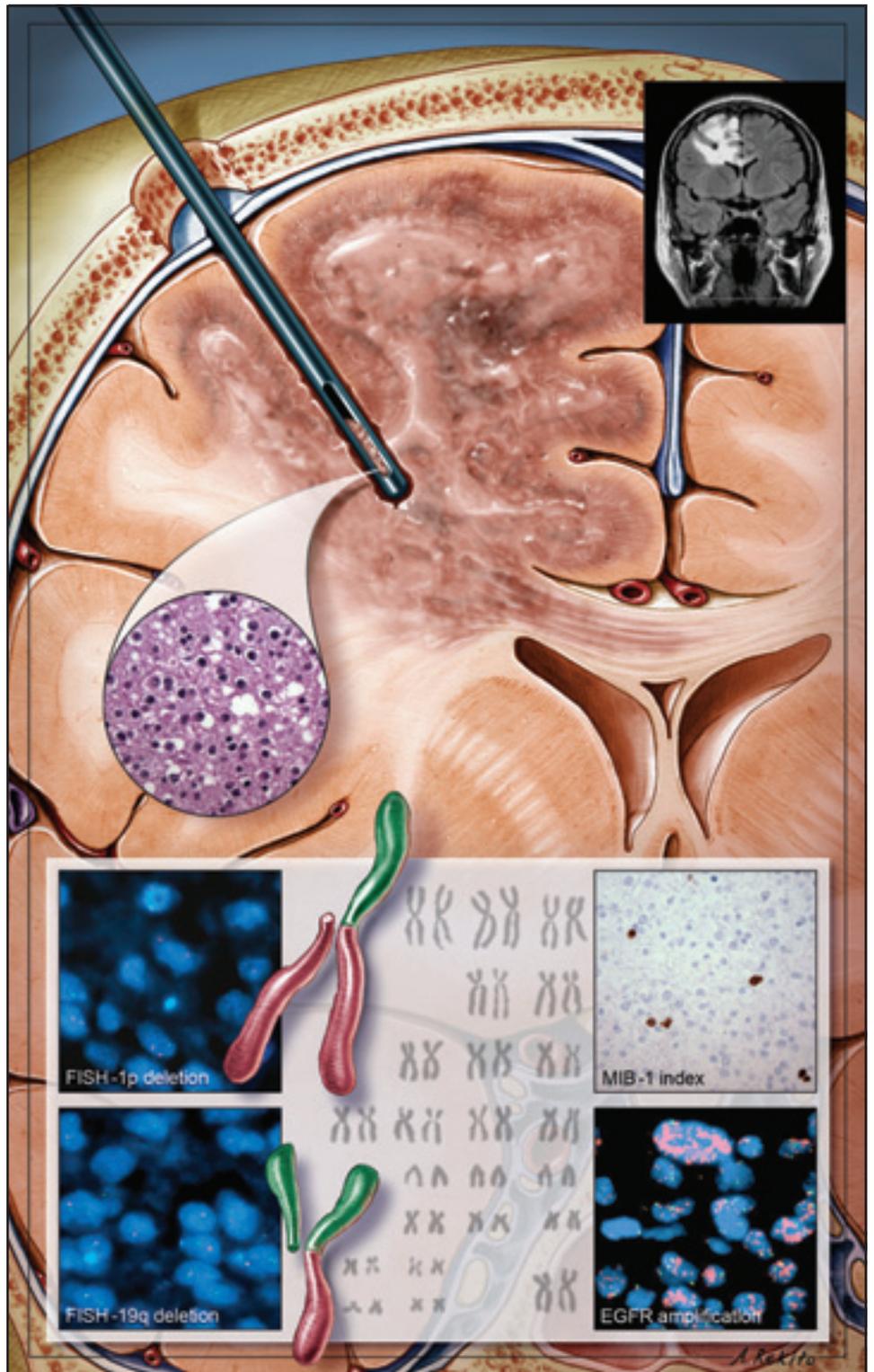
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www.mcg.edu/som/neurosurgery

MCG

Neuroscience Center



New Standards in Diagnosis and Treatment of Brain Tumors

Chair's Message

In the Spring of 2002, a little over three years ago, we attained departmental status. Since that time, we have accomplished a lot on our road to academic excellence. Our primary effort in this short period of time has been to recruit and retain excellent clinical faculty, develop unique research programs coupled with clinical programs of strength, and to provide a strong educational environment. In recognition of this, we have recently been featured in the February 2005 issue of Academic Physician and Scientist, *Department of Neurosurgery Uses Innovative Strategies for Growth*.

During this time, we have recruited four outstanding neurosurgeons, including our most recent faculty addition, Dr. Jose Santiago. Dr. Santiago will primarily be part of our community-based neurosurgery service, and he will fully participate in our educational programs. In addition, during this time period, we have been fortunate to attract to our department a physiatrist to support the Neurosurgery Spine Program, and a medical neuro-oncologist to develop the Brain Tumor Program, as featured in this issue.

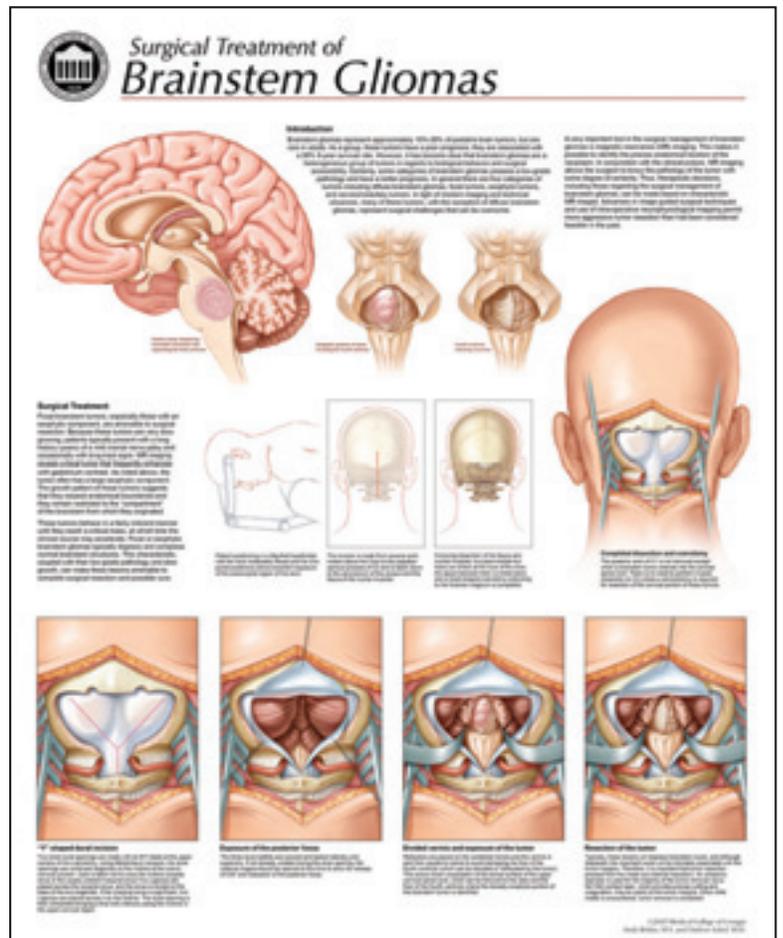
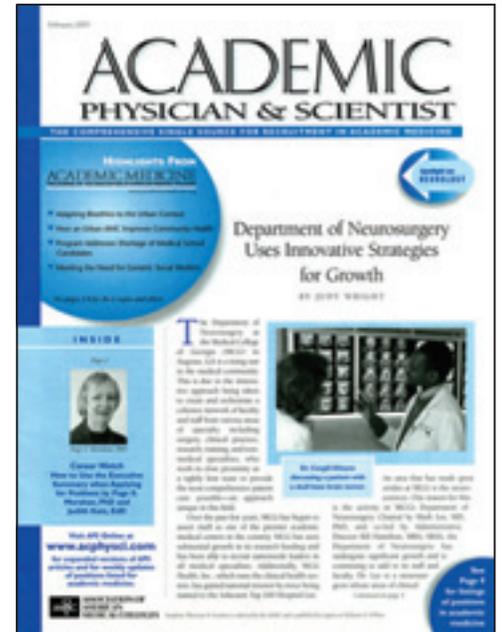
We have also recruited three full-time research faculty members since our establishment as a department. Drs. Kirov and Fomitcheva have established the departmental epilepsy research program including the Human Brain Laboratory, which will be featured in a future issue of this newsletter. Dr. Krishnan Dhandapani, in conjunction with Dr. Cargill Alleyne, will develop the Neurovascular Research Laboratory. While our research efforts have just begun, we already have achieved a ranking of 39th in NIH funding for neurosurgery programs, and we have submitted over \$2.7 million in NIH grant applications in this year alone. We are currently recruiting a research faculty member to establish a departmental neuro-oncology research program.

On the educational front, we have been approved to increase the length of our residency program by one year, and we will be taking two resident applicants in this year's upcoming match. In addition, we have started our Spine Fellowship Program under the direction of Dr. Haroon Choudhri.

Finally, I would like to thank Andy Rekito who has been instrumental in developing our editorial department and this newsletter. Andy has been our award-winning medical illustrator, and we will miss him as he takes up new challenges in Portland, Oregon.

Mark R. Lee, M.D., Ph.D., F.A.C.S.

*Professor and Allen Distinguished Chair
Department of Neurosurgery*



Illustrations created for an upcoming chapter by Darlene Lobel, M.D. and Mark Lee, M.D.

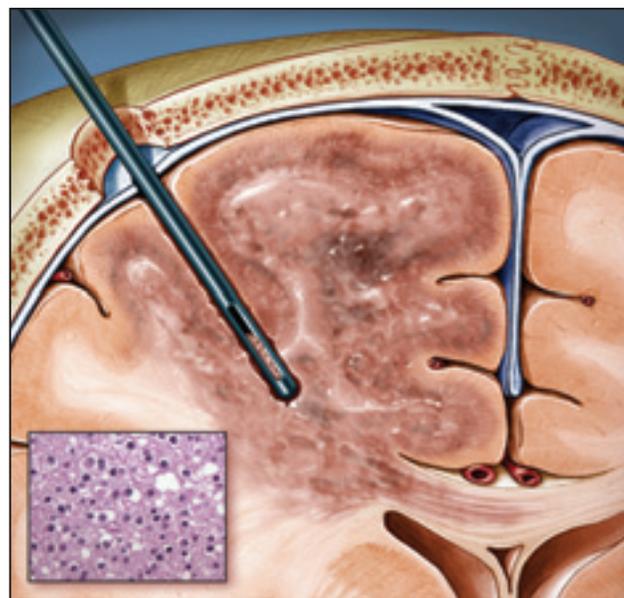
Clinical Spotlight

Neuro-Oncology at the Medical College of Georgia

An increasing number of patients, over 17,000 per year, are diagnosed with new primary malignant brain tumors. Benign and malignant primary brain tumors account for over 35,000 new cases per year. In addition, brain metastases occur in 15 to 40% of cancer patients with an estimated incidence of over 170,000 new cases per year in the United States.

Fortunately, the old concept that “for the past thirty years the prognosis for patients with brain tumors has not changed” is no longer applicable. In fact, several advances in diagnostic techniques, such as molecular targets, as well as new therapies have changed the prognosis and quality of survival for brain tumor patients.

One of the most significant improvements has been seen in patients with primary central nervous system lymphoma. The now-standard inpatient protocol with high-dose chemotherapy has been largely successful in prolonging survival without significant toxicity. More recent clinical trials have been developed offering outpatient treatments with very promising early results.



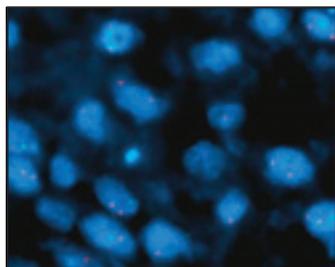
Tumor biopsy with a traditional H&E stain sample

Recent Advances

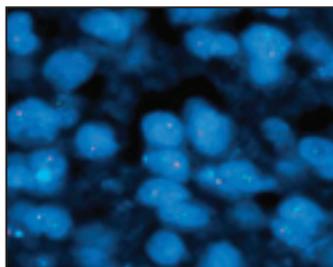
Molecular targeted therapy for gliomas has contributed to our understanding of the mechanisms of tumor sensitivity and resistance, and has led to the development of specific treatments. We now know that tumor chemosensitivity depends mainly on the genetic markers rather than histology or grade.

Furthermore, the old concept that low-grade tumors do not respond to chemotherapy is also no longer absolute; the response depends on the patient's chromosomal findings. While radiation therapy combined with chemotherapy is the new standard of care for very aggressive tumors such as glioblastoma multiforme, pre-irradiation chemotherapy, based on the molecular diagnosis, is recommended for less aggressive tumors that afford longer patient survival. This modality allows delaying or avoiding the potential late effects of radiation therapy, especially cognitive functions.

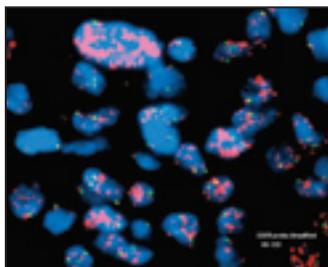
The new standards for diagnosis and medical treatment of brain tumors utilize these genetic markers along with traditional H&E staining to ensure the most effective therapy.



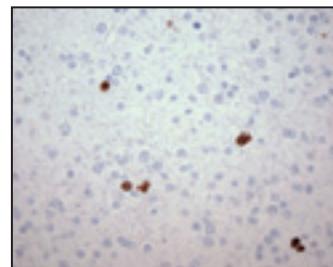
FISH - 1p deletion



FISH - 19q deletion



EGFR amplification



MIB-1 index

Clinical Services and Research

The Neuro-Oncology Program at MCG provides molecular targeted therapy protocols, a neuro-oncology lab, high-dose chemotherapy protocols, investigator-initiated clinical trials, and clinical research studies for adult and pediatric patients with brain tumors. Patients can participate in clinical trials conducted by cooperative groups through NCI and MB-CCOP, such as ECOG and COG, among others. Clinical and basic science research studies are also being developed with the objective of finding potential novel cancer therapies.

Alfredo D. Voloschin, M.D.

To learn more about the Neuro-Oncology Program and the Brain Tumor Center at MCG, please visit:

www.mcg.edu/som/neurosurgery/BrainTumorProgram/BTindex.htm



Dr. Alfredo Voloschin leads a discussion at the weekly brain tumor board review. Other participants include faculty and residents from the departments of neurosurgery, radiation oncology, neuropathology, and neuroradiology.

Clinical Spotlight

Pediatric Neurosurgery at the Medical College of Georgia

Pediatric neurosurgery encompasses a spectrum of interventions: from prenatal evaluation and counseling, to treatment of premature infants, through management into adolescence. We also treat developmental anomalies that can present in adulthood. At MCG Children's Medical Center, we have the expertise and the facility to provide the highest standard of care for children with neurosurgical issues. Given the complex nature of many pediatric neurosurgical conditions, our division promotes a team approach to preoperative evaluation, perioperative care, and surgical intervention. We work closely with pediatric neurologists, epileptologists, and other pediatric subspecialists, such as urologists, endocrinologists, orthopaedists, plastic surgeons, and oncologists to provide comprehensive care to our patients. Our primary goal and motivation is to ensure that all of our patients have the opportunity to reach their greatest potential.



Dr. Kimberly Bingaman operates in the Children's Medical Center with members of the MCG Pediatric Neurosurgery team

Clinical Programs

Brain and Spinal Cord Tumors

We use image guidance, microscopic technique, and ultrasonic aspiration for intraoperative management of brain and spinal cord tumors. In eloquent areas of the brain, we also conduct motor mapping in order to delineate and avoid areas of motor function during tumor or epilepsy resection.

Craniofacial Surgery

We treat congenital craniofacial disorders, such as craniosynostosis, and craniofacial deformities resulting from trauma or tumors.

Hydrocephalus

We manage hydrocephalus by placing shunts and utilizing a variety of endoscopic procedures, such as endoscopic third ventriculostomies, septostomies, and cyst fenestrations.

Head and Spine Trauma

Head and spine trauma cases are managed in conjunction with a seasoned pediatric intensive care team. Procedures such as ventriculostomies, intracranial pressure monitoring, and decompressive craniectomies are instituted when necessary. We have also utilized spinal instrumentation in children as young as one year of age who have suffered a spine injury, which provides stability to their spine and allows them to experience maximal mobility.

Cerebrovascular Disease

Cerebrovascular disease includes conditions such as vascular malformations, aneurysms, and moyo moyo disease. These conditions are managed in conjunction with interventional neuroradiology and cerebrovascular neurosurgery.

Epilepsy

Our pediatric epilepsy program is one of the largest in the country. Our procedures include vagal nerve stimulator placement, subdural grid and depth electrode placement, intraoperative electrocorticography and mapping, corpus callosotomies, and hemispherectomies.

Spinal Dysraphism

Spinal dysraphism, or neural tube defect (NTD), is a broad term encompassing a heterogeneous group of congenital spinal anomalies, which result from defective closure of the neural tube early in fetal life. We treat disorders in this category such as spina bifida, tethered cord, and lipomyelomeningocele.

Cerebral Palsy and Spasticity

Our multimodality spasticity team evaluates cerebral palsy and spasticity patients. We perform procedures that include botox injections, selective dorsal rhizotomy, and baclofen pump placement.

Clinical Report

A four month-old infant was found to have a fatty mass on her back. Her MRI showed a tethered cord and a lipomyelomeningocele. If left untreated, she could develop urinary incontinence, leg and back pain, lower extremity deformities and weakness, and scoliosis. In a lipomyelomeningocele, the nerve roots and the spinal cord can be encased in fatty tissue and can be quite complex.

We have recently acquired a tool for the intraoperative management of these difficult lesions that makes the surgery much safer and more precise. This tool, the nd:YAG laser, is a contact laser with a pinpoint tip that allows us to focus the laser energy to tissue at a depth of less than 0.5mm. We are able to dissect and resect the fatty tissue off of the neural tissue in a very precise manner under the microscope.

The child underwent a lumbar laminoplasty, dural opening, and resection of lipoma with cord untethering. The filum was also cut and a dural graft was utilized to make the thecal space more capacious. The child did very well after surgery and is neurologically normal.

Kimberly D. Bingaman, M.D.



Pre-op MRI's



Post-op MRI's

To learn more about the Pediatric Neurosurgery Program and the Children's Medical Center at MCG, please visit:

www.mcg.edu/som/neurosurgery/PediatricNeurosurgery/index.htm

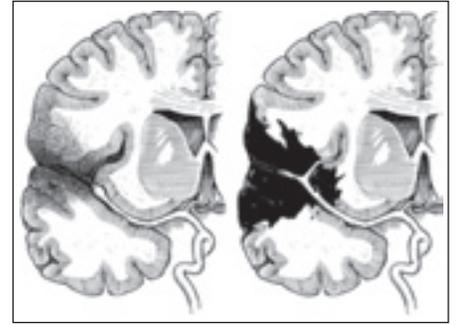
Department News

New Medical Illustrator Hired

Michael Jensen, M.S. joined our editorial department in June 2005. Michael received a Bachelor of Fine Arts in illustration from Brigham Young University in 1992 and a Master of Science in Medical Illustration from MCG in 2005. Michael is also a professional animator and has received numerous academic scholarships and honors. He was the illustrator for the *Curious George* series of children's books from 1998 to 2000. We welcome Mike's versatility and artistic expertise to our editorial department.



Andy Rekito, our previous illustrator, has relocated to Portland, OR. He will continue to contribute to our publications in the foreseeable future. We wish him all the best in his future endeavors.



"Intracranial Hemorrhage" by Michael Jensen

MCG Neurosurgery Makes NIH List of Top Grant Awards in FY 2004

For the first time, our department has been listed among the neurosurgery departments with the greatest dollar amount of NIH awards. We were ranked number 39 in 2004, a mere three years after achieving departmental status. We hope to maintain this upward trajectory as we continue our academic mission in the upcoming years.

MCG Neurosurgery Featured in Academic Physician and Scientist

The February 2005 issue of the *Academic Physician and Scientist* featured an article as its cover story that chronicles our department's innovative strategies for growth. It outlined our unique partnerships, expansion to a community-based practice, and aggressive recruitment in both the clinical and research arenas. **Judy Wright**, our editor, authored the article.

Faculty Update

New Faculty Appointments



Krishnan Dhandapani, Ph.D. joins our faculty on September 1st as Assistant Professor to establish a Neurovascular Research Laboratory in conjunction with Cargill Alleyne, M.D. He will have joint appointment in the Institute of Molecular Medicine and Genetics. Dr. Dhandapani received his Ph.D. with distinction from the Medical College of Georgia in 2003. His thesis was

Mechanisms of Neuroprotection by Estrogen and Selective Estrogen receptor Modulators. He then became a postdoctoral research associate in the laboratory of his Ph.D. advisor, Dr. Darrell Brann, and in 2004 worked as a postdoctoral fellow (NINDS) at the University of Connecticut Health Center.



Jose A. Santiago, M.D. joined our faculty on June 1st to staff our affiliated hospital, Aiken Regional hospital in Aiken, South Carolina. Dr. Santiago completed his medical training at Tulane School of Medicine in 1980 and his residency in neurosurgery at University of Texas-Galveston branch. Most recently he has been working in private practice in Florence, South Carolina.



Vladimir Riazanski, Ph.D. joined our faculty in May 2005 as Postdoctoral Fellow in the Human Brain Laboratory under the direction of Dr. Sergei Kirov. He received his Ph.D. from Bonn University in Germany. His doctoral thesis elucidated the functional role of A-type potassium channels in hippocampal granule cells during epilepsy.

Spine Fellowship Initiated

A combined research and clinical fellowship in complex spinal surgery has been established under the direction of **Haroon Choudhri, M.D.** The Neurosurgery Spine Program treats a large number of cases in all areas of spinal pathology, including degenerative disease, tumors, trauma, infection, spinal deformity, and complex revisions. The fellow participates in a large number of transthoracic/retroperitoneal cases and minimally invasive endoscopic cases. The fellow assumes increasing responsibility in operative cases and in Neurosurgery resident education.



Lance Perling, M.D. joined the department as our first Spine Fellow on April 1st, 2005. Dr. Perling completed his medical training at MCG in 1982 and his neurosurgery residency at Baylor College of Medicine. He has practiced in Atlanta, Georgia for many years.

Accomplishments and Recognition

Cargill H. Alleyne, Jr., M.D. served as Scientific Program Chair of the Georgia Neurosurgical Society for 2004-2005. The honored guest at the Spring meeting in Sea Island, GA was Dr. Fred Geisler.

Cargill H. Alleyne, Jr., M.D. was selected to serve as Assistant Editor of *Contemporary Neurosurgery*.

Ellen Shaver, M.D. served as a guest examiner at the neurosurgery oral boards examinations last Fall.

Resident Corner

Accomplishments and Recognition



Cheng Tao, M.D. graduated from the MCG neurosurgery residency program in June 2005. Dr. Tao will join a private practice group in Alabama in August 2005. We wish him all the best.



Ahmed Shakir, M.D. started his PGY-2 year in July 2005. Ahmed completed his medical training at University of Texas Southwestern and an internship at MCG. We warmly welcome him.

Residency Program Update

Program Length to Change

Beginning in July 2006, the length of the training program will increase from five to six years after surgical internship. To facilitate the transition we have been given approval to simultaneously accept our first seven-year resident and final six-year resident. The extension in the length of training will lead to an enhanced research experience and will afford us the opportunity to introduce new clinical rotations into the program.

Historical Vignette

George W. Smith, M.D - First Head of Neurosurgery at MCG



When Dr. William Moretz was appointed Chairman of the Department of Surgery at MCG in 1955, he recruited Dr. George Smith to organize a residency training program in Neurosurgery. Dr. Smith was a native of Indiana, received his residency training in Neurosurgery at the University of Maryland, and completed a fellowship at the Johns Hopkins Hospital. By all accounts, Dr. Smith was a very charismatic and dynamic individual. He gained fame for his medical treatment of tic douloureux with stilbamidine, the treatment of

cervical disease by anterior discectomy and interbody fusion (as in the Smith-Robinson technique), and is generally credited with the development of the first power drill with a clutch mechanism in neurosurgery (now widely known as the Codman perforator). Some of the diagnostic techniques he employed included pantopaque myelograms and ventriculograms, pneumoencephalograms and air ventriculograms, angiograms, and electroencephalograms. Dr. Smith attracted large numbers of patients and trainees. In 1957 he applied to the American Board of Neurological Surgery for approval for a training program and four years of residency training were granted in 1959. His many outside interests included building a swimming pool for his children, developing plans for a motel, and aviation. In 1964, he tragically died when the plane he was piloting crashed in Texas. His wife and mother were also killed in the accident. Their seven children survived Dr. Smith and his wife.



Portrait by Frances DeRoller, neurosurgery medical illustrator during the 1960's and 1970's

Scott Rahimi, M.D. passed the written portion of the neurosurgery board examination in March 2005. Congratulations!



Scott Rahimi, M.D. won the prize for best resident presentation at the Spring meeting of the Georgia Neurosurgical Society meeting in Sea Island, GA. Dr. Rahimi's presentation was entitled *The effect of Cox-2 inhibitors on postoperative pain in patients following craniotomy.*

Scott Rahimi, M.D. recently received national recognition from the published study *Golf-associated head injury in the pediatric population: a common sports injury*, J Neurosurg (Pediatrics 2) 102:163-166, 2005, of which he was first author. Dr. Rahimi's paper was featured in a wide array of news publications and broadcasting organizations, including the New York Times, ABC news, the Associated Press-Atlanta, CNN radio, Forbes, and the Augusta Chronicle, among others. Over twenty internet sites also carried the story.

Pre-residency Fellowship Initiated

In an effort to meet our increased clinical volume in the era of the 80-hour work week, we have begun a pre-residency fellowship in Neurosurgery at MCG. Derold Santilus, M.D. began his one-year fellowship in February 2005.

Presentations and Publications (January-June 2005)

Presentations:

Kirov SA, Molnar C, Andrew RD: Real-time two-photon microscopy of volume changes in pyramidal neurons and dendrites deep within cortical slices. The 38th Winter Conference on Brain Research. Breckenridge, CO, February 2005 (Poster)

Marshall R, Collins WG, Williams J, Hess D: Tearing down the walls: Creating a patient- and family-centered adult inpatient neuroscience unit. The 2nd International Conference on Patient- and Family-centered Care, San Francisco, CA, February 2005

Alleyne CH: Subarachnoid hemorrhage. Anesthesiology Grand Rounds. Medical College of Georgia, March 2005

Choudhri HF, Lobel DA, Tao CW: Vertebral distraction cage in spinal reconstruction after thoracolumbar corpectomy. American Association of Neurological Surgeons Meeting. New Orleans, LA, April 2005 (Poster)

Alleyne CH: Subarachnoid hemorrhage and what to do with asymptomatic aneurysms. Brain and Heart Attack Course. Hilton Head, SC, April 2005

Alleyne CH: How to treat carotid stenosis: Stenting vs. endarterectomy. Brain and Heart Attack Course. Hilton Head, SC, April 2005

Vender JR: Intracerebral hemorrhage and big infarcts - surgical approach. Brain and Heart Attack Course. Hilton Head, SC, April 2005

Alleyne CH: Cerebrovascular disease. Primary Care and Family Practice Symposium. Augusta, Georgia, April 2005

Beau MA, Taylor RA, Vitaliani R, Liebeskind DS, **Voloschin A**, Houghton DJ, Galetta SL, Dalmou J: Reversible encephalitis and novel antibodies to synaptic-enriched regions of the hippocampus: Clinical, neuroimaging, and immunologic correlates. American Academy of Neurology Meeting, Miami, FL, April 2005 (Poster)

Harris KM, **Kirov SA**, Ostroff L: Regulation of synapse number and structure during Hebbian and homeostatic synaptic plasticity. Learning and memory, Cold Spring Harbor, NY, April 2005

Rahimi SY, Macomson SD, French A, Smith JR, Vender JR, Alleyne CH: The effect of Cox-2 inhibitors on postoperative pain in patients following craniotomy. Georgia Neurosurgical Meeting. Sea Island, GA, May 2005

Voloschin AD: Molecular targeted therapy to anaplastic gliomas. Case-study. Georgia Neurosurgical Meeting. Sea Island, GA, May 2005

Miller JT, **Rahimi SY, Lee M:** History of infection control and its contributions to the development and success of brain tumor operations. Georgia Neurosurgical Meeting. Sea Island, GA, May 2005

Alleyne CH: How to treat carotid stenosis: Stenting vs. endarterectomy Family Practice Grand Rounds, Medical College of Georgia, June 2005

Publications:

Voloschin AD, Loius DN, Cosgrove GR, Batchelor TT: Neoadjuvant temozolomide followed by complete resection of a 1p- and 19q-deleted anaplastic oligoastrocytoma: case study. *Neurooncol* 7 (1):97-100, 2005

Vender JR, Hester S, Rekito A, Lee MR: Baclofen intrathecal pump delivery systems. Avoidance and management of complications in adult and pediatric patients: Part I. *Contemporary Neurosurgery* 27 (1), 2005.

Vender JR, Hester S, Rekito A, Lee MR: Baclofen intrathecal pump delivery systems. Avoidance and management of complications in adult and pediatric patients: Part II. *Contemporary Neurosurgery* 27 (2), 2005.

Wright J: Department of Neurosurgery Uses Innovative Strategies for Growth. *Academic Physician and Scientist*, February 2005

Fincher ME, Forsyth M, **Rahimi SY:** Successful management of central nervous system infection due to propionibacterium acnes with vancomycin and doxycycline. *Southern Medical Journal* 98 (1):118-21, 2005

Rahimi SY, Singh H, Yeh DJ, Shaver E, Flannery AM, Lee MR: Golf-associated head injury in the pediatric population: a common sports injury. *J Neurosurg (Pediatrics)* 102:163-166, 2005.

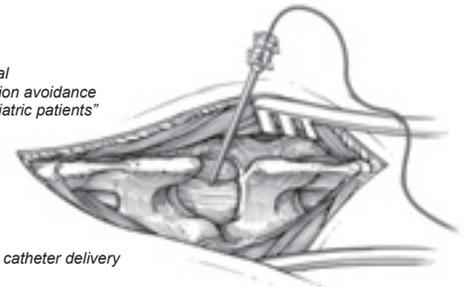
Miller JT, **Rahimi SY, Lee M:** History of infection control and its contributions to the development and success of brain tumor operation. *Neurosurg Focus* 18 (4):E4, 2005

Choudhri HF, Webb D: Reconstruction options after ventral thoracic spinal cord decompression. *Contemporary Neurosurgery* 27 (10), 2005

Miller JT, **Rahimi SY, Lee M:** History of infection control and its contributions to the development and success of brain tumor operation. *Neurosurg Focus* 18 (4):E4, 2005

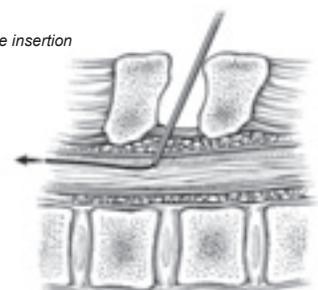
Petrak LJ, Harris KM, **Kirov SA:** Synaptogenesis on mature hippocampal dendrites occurs via filopodia and immature spines during blocked synaptic transmission. *J Comp Neurol* 484:183-190, 2005

illustrations for "Baclofen intrathecal pump delivery systems: Complication avoidance and management in adult and pediatric patients"



B. Intrathecal catheter delivery

A. Normal Tuohy needle insertion





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Neuroscience Outlook

To learn more about the MCG Department of Neurosurgery, please visit:
www.mcg.edu/som/neurosurgery

Conference Schedule (August 2005 - January 2006)

All grand rounds and conferences take place on Friday in the 3 West amphitheater.

Aug 05	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Mark Lee "An Introduction to Hydrocephalus" Case Conference	Oct 07	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Chris Hall "Etiology/Management of Spontaneous ICH" Case Conference	Dec 02	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Neuro101 - Dr. Kimberly Bingaman "Pediatric Brain Tumors" Case Conference
Aug 12	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Anatomy Journal Club Case Conference	Oct 14	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00	Neuro-Oncology Conference Neuropathology Grand Rounds - Dr. J. Schramm Rheinische Friedrich-Wilhelms- Universitat, Germany "The Spectrum of Epilepsy Surgery" Rounds with the Residents and Case Discussion with Dr. J. Schramm	Dec 09	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuropathology Journal Club Case Conference
Aug 19	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuropathology Neuro 101 - Dr. Cargill Alleyne "An Introduction to Subarachnoid Hemorrhage" Case Conference	Oct 21	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Ellen Shaver "Management of Peripheral Nerve Injury" Journal Club M&M Conference	Dec 16	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. David Floyd "Clinical Localization in Disc Disease" Anatomy Case Conference
Aug 26	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Radiology Review Hands-on workshop with MedTech M&M Conference	Oct 28	RESIDENT INTERVIEWS		Dec 23	CHRISTMAS HOLIDAY	
Sep 02	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. John Vender "Head Injury" Case Conference	Nov 04	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Mona Samdani "Spinal Cord Injury" Neuropathology Case Conference	Dec 30	NEW YEARS HOLIDAY	
Sep 09	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 11:00 – 1:00	Neuro-Oncology Conference Neuropathology Journal Club Case Conference	Nov 11	RESIDENT INTERVIEWS		Jan 06	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Haroon Choudhri "Thoracolumbar Spine Trauma" Case Conference
Sep 16	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Dion Macomson "Cervical Spine Trauma" Anatomy Case Conference	Nov 18	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Anatomy Radiology Review M&M Conference	Jan 13	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuropathology Journal Club Case Conference
Sep 23	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Radiology Review M&M Conference	Nov 25	THANKSGIVING HOLIDAY		Jan 20	8:00 – 9:00 10:00 – 11:00 11:00 – 12:00 12:00 – 1:00	Neuro-Oncology Conference Neuro 101 - Dr. Hamid Shah "Brachial Plexus Lesions" Anatomy Case Conference
						Jan 27	8:00 – 9:00 10:00 – 11:00 11:00 – 1:00	Neuro-Oncology Conference Radiology Review M&M Conference

Upcoming Meetings (July-December 2005)

Congress of Neurological Surgeons

10/8 - 13, Boston MA

Research Update in Neuroscience for Neurosurgeons

10/23 - 30, Woods Hole, MA

American Board of Neurological Surgery (Orals)

11/8 - 11, Houston, TX

Georgia Neurosurgical Society Meeting

11/18 - 19, Atlanta, GA

AANS/CNS Section on Pediatric Neurological Surgery

12/6 - 10, Point Clear, Alabama

Credits

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Judy Wright

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Cargill H. Alleyne, Jr., M.D.

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MCG
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www.mcg.edu/som/neurosurgery