



Neurosurgical management of epilepsy offers new hope in eliminating seizures

by P. David Adelson, MD,
Director of Adult and Pediatric Surgical Epilepsy

Epilepsy is a common neurologic disorder in both adults and children, and the most common in childhood. Approximately five percent of children and adolescents in the United States will experience a seizure by the age of 20. Of these, 25% will develop a chronic seizure disorder or “epilepsy” lasting into adulthood.

The neurosurgeons role in the management of epilepsy begins when the patient’s seizures are not adequately controlled by appropriate antiepileptic drugs (AED). The concern is that continued medically intractable epilepsy has increased morbidity (impacting on memory and cognitive function), mortality, and in children, impacts on the normal development of the brain and that surgical treatment has the potential to intervene.

While for adults, surgical cure or treatment of the intractable seizures has the potential for improved long term effects and quality of life, in children, early identification and treatment maximizes the chance for a child’s neurologic development and independence. Because of the increasingly recognized morbidity of medically intractable epilepsy, the epilepsy team, inclusive of neurosurgeons, neurologists, neuro-radiologists, neuropsychologists, and

neurophysiologists have been increasingly aggressive in the initiation of surgical evaluation and management in the effort to eliminate or at the least, reduce the intensity and frequency of a patient’s seizures.

While not all neurosurgical interventions are curative, recent advances such

is the treatment of choice for epilepsy, some patients have persistent seizure activity that, despite maximal medical treatment, results in debilitating and life threatening seizures.

The definition of “medically intractable” may be ambiguous at times but involves characterizing the number and

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as the vagal nerve stimulator (VNS) offer new opportunities to treat epilepsy patients with a less invasive approach that offers potential relief. Following is a review of the surgical options available for the epileptic patient with medically intractable seizures.

Surgical Evaluation

The neurosurgeon with a specialty interest in epilepsy will involve himself early in the course of the patient’s disease by working with the epileptologist and multi-disciplinary team such as the University of Pittsburgh Epilepsy Center (UPEC) to establish the diagnosis and its medically intractable nature.

The diagnosis of epilepsy is not always straight forward. Besides a careful history, an adjunct of imaging and physiologic tests will clarify and confirm the diagnosis of epilepsy. And while medical management with AEDs

frequency of the seizures, the length of time that the seizures have not been under control, the different AED attempted and also the impact on the psychosocial function of the patient and on the quality of life. One seizure a year may be considered intractable to some patients who are limited in their ability to drive or to be involved in certain vocations, while in an affected child with severe maldevelopment, a number of seizures a week may be considered reasonable control.

Recognizing the complexity of this definition, neurosurgeons can sometimes provide a perspective to surgery that is not necessarily defined by the reduction in seizure frequency. The goal of surgery for epilepsy remains to not only eliminate or reduce the frequency of epileptic events, but improve the quality of life and in children, to maximize neurodevelopment.

Noninvasive and Invasive Evaluation

The noninvasive evaluation is considered the first phase in the neurosurgical evaluation and treatment of pediatric epilepsy.

Once, the noninvasive evaluation has defined the seizure diagnosis and its intractability as well as the potential seizure focus and treatment, consideration for the type and timing of the surgical intervention can be discussed. The goal is establish the “converging lines of evidence” and identify the locus of the seizures. When the localization of the seizure focus is unclear, the epilepsy team may decide to pursue a second phase of evaluation consisting of invasive monitoring.

Cranial base course highlights cutting edge endoscopic techniques



Drs. Amin Kassam and Carl Snyderman (left) perform endoscopic procedure in the operating room as course attendees observe (right) from the conference room. The course consisted of lectures on approaches for endoscopic surgery of the cranial base and pituitary fossa. The next course is scheduled for September (see our News & Notes section).

(See *Epilepsy* on page 4)

2004 academic year shows dramatic accomplishments

As we end the academic and fiscal year on June 30, 2004, our faculty, staff and trainees can look back with pride on the accomplishments of the department over these last 12 months. We have had a record number of patient care contacts, a combined surgical volume at our affiliated hospitals in excess of 8,000 surgical procedures, and a ranking of No. 2 nationally in NIH research funding (surpassed only by the University of California, San Francisco).

This year, we have had a tremendous resident team on our clinical services, and are pleased that our three outstanding graduates from residency training all will be entering academic practice.

Dr. Elad Levy, who completed not only his neurosurgical training but also sub-specialty training in endovascular surgery, will be returning to the State University of New York at Buffalo. Elad published 67 peer-reviewed publications during his residency training, and will continue his pioneering efforts in endovascular surgical techniques at Buffalo.

Dr. Richard Spiro finished his training in neurological surgery also, and has joined our faculty with a sub-specialty focus in spine, complex spine, and minimally invasive spine strategies. He is an outstanding individual and will be of vital importance to our educational mission as well as clinical service delivery. Dr. Spiro will practice at UPMC Presbyterian and UPMC Shadyside, and the Oakland Veterans Affairs Medical Center.

Although Dr. Elizabeth Tyler-Kabara will be leaving us for one year to do her pediatric neurosurgical fellowship at the University of Alabama-Birmingham, I am delighted that she is returning to our faculty in July 2005. Dr. Tyler-Kabara will have a special focus in pediatric neurosurgery, regenerative medicine, and molecular neurosurgery.

Three new residents joined our training program at the PGY-1 year, Dr. Dean Kostov (University of Pittsburgh), Dr. Richard Singleton (Medical College of Virginia) and Dr. Hilal Kanaan, (Wayne State University).

We are also pleased to welcome Dr. Joseph Ong who has accepted an offer for a senior level residency training to complete his residency at the University of Pittsburgh after transferring from Thomas Jefferson University in Philadelphia.

With almost 100 peer-reviewed publications by our faculty in the past year, and multiple other book chapters and published abstracts, the educational and academic productivity of our faculty remains extremely high.

This year, we inaugurated our third gamma knife unit. We anticipate opening the new magnetoencephalography (MEG) unit for diagnosis of multiple brain pathologies, as well as a new spinal radiosurgical system in the next academic year.

Congratulations are in special order for Dr. A. Leland Albright, a repeated winner of the residents voting for the Faculty Teaching Award, and to Dr. Spiro who won this year's faculty award for resident teaching.

Excellence in patient care, teaching, and academic productivity continue. Our patients and referring doctors are encouraged to call our office at (412) 647-3685 if they have any questions about care or services provided. In addition, our internet website at www.neurosurgery.pitt.edu provides a description of our faculty, our programs, and abundant information about procedures and clinical care at our institution. ■

L. Dade Lunsford, MD

Lars Leksell Professor

Chairman, Department of Neurological Surgery



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Advanced imaging methods help identify regions of epilepsy seizure onset

by Mark L. Scheuer, MD

Director, University of Pittsburgh Epilepsy Center,
Adult Division

The use of new neuroimaging techniques in patients with intractable seizures increasingly provides important information concerning potential candidates for resective epilepsy surgery. New techniques being utilized at the University of Pittsburgh Medical Center during the evaluation of patients with medication-resistant epilepsy include ictal and interictal SPECT scanning, subtraction ictal SPECT co-registered to MRI (SISCOM), high resolution thin cut MR imaging, interictal and ictal PET scanning, and brain surface reconstruction from volumetric MRI data.

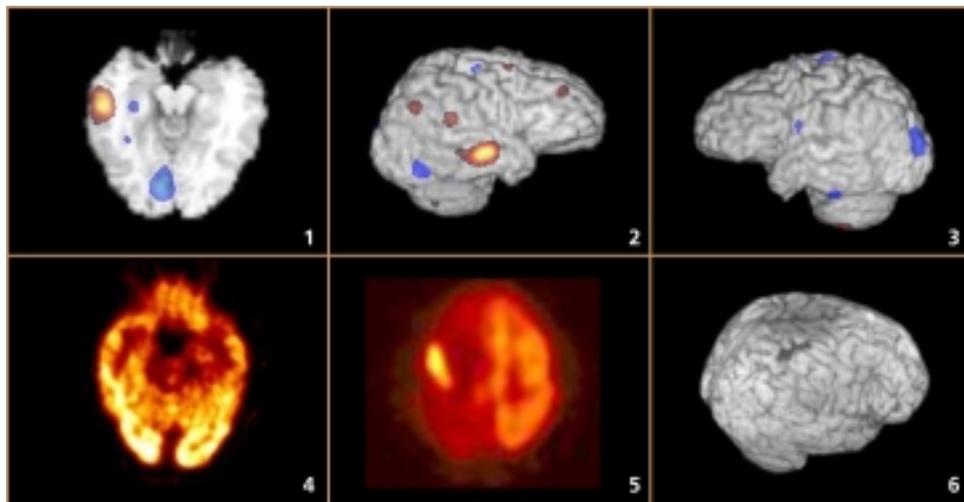
During a patient's epilepsy monitoring unit (EMU) stay for continuous video-EEG monitoring, SPECT scanning is performed during an ictal event whenever possible. This involves injection of Tc-99m ECD (Neurolite) within seconds of ictal onset, while the seizure is ongoing.

The tracer distributes approximately according to cerebral blood flow, providing a qualitative map of blood flow during the ictus. This map can then be compared to an interictal baseline SPECT scan performed at a time distant from the occurrence of a seizure.

Because cerebral perfusion often increases markedly in the region of most intense ictal activity, the comparison of ictal to baseline SPECT scans sometimes reveals regions of hyperperfusion that are candidate sites for the zone of seizure onset. This technique can be further refined through computerized co-registration, normalization, and subtraction of the interictal from ictal perfusion maps.

Areas of marked relative ictal hyperperfusion can then be superimposed on a co-registered MR image for better anatomic definition of the site of ictal hyperperfusion. This technique, termed SISCOM, proves helpful in targeting a site or sites for implantation of intracranial recording electrodes to further establish the site of ictal onset.

Figure 1 shows an axial SISCOM image obtained during the evaluation of a patient with complex partial seizures of neocortical origin. A region of right lateral temporal hyperperfusion is evident. This patient had been having several seizures per week for many years. No anatomic



abnormalities were evident on MR imaging. Scalp video-EEG monitoring suggested a possible right hemispheric infrasyllian ictal onset region.

Figure 2 shows another reconstruction of the SISCOM data utilizing a co-registered surface reconstruction of the brain obtained from the patient's MRI data. The most intense regions of ictal hyperperfusion are colored yellow, and areas of relative hypoperfusion, blue. A region of ictal hyperperfusion is evident over the right middle temporal gyrus, whereas no regions of hyperperfusion were evident on the left (figure 3).

These images, in conjunction with EEG data, helped to guide implantation of intracranial grid electrodes over the right. The patient has now been seizure free for six months following a resection of tissue from the right lateral temporal and temporo-occipital region. Tissue analysis revealed severe gliosis in these areas.

Interictal FDG PET scanning provides valuable localizing physiological data in some patients with intractable epilepsy. Figure 4 shows a region of left mesial temporal interictal hypometabolism in a man in whom scalp EEG monitoring was consistent with left temporal onset seizures, but in whom only equivocal MR imaging abnormalities were evident.

Ictal FDG PET scanning is also sometimes possible, but is technically difficult to accomplish. Figure 5 shows a discrete region of intense right fronto-parietal hypermetabolism in a patient with a large right hemispheric AVM and prior stroke who was experiencing very frequent disabling refractory focal motor seizures. The ictal PET

scan was obtained to evaluate the site of seizure generation relative to the large region of surrounding dysfunctional and anatomically abnormal tissue.

The generation of reconstructed brain surface images from high resolution thin cut anatomic MR data can sometimes provide important information in the evaluation of patients for epilepsy surgery. Such reconstructions can be used in SISCOM images, as shown above, but can also be used to evaluate for regions of cortical gyral abnormalities that are not readily apparent on the usual visual analysis of planar MR images.

Surface reconstructions can also be used in conjunction with EEG data obtained from implanted intracranial electrodes and intraoperative photos of grid locations to generate anatomically pertinent maps to help guide the neurosurgeon during cortical resections to alleviate intractable epilepsy.

Figure 6 shows a surface reconstruction of the brain of a woman who had previously undergone a focal cortical resection for the treatment of refractory seizures originating in the lateral fronto-parietal junction region. A small area of cortical resection is readily apparent.

Progress in anatomical and physiological imaging of the brain is helping in our ongoing efforts to effectively treat patients with medication-resistant epilepsy. Broader application of newly available imaging technologies, and future developments in brain imaging, promise to expand the number of epilepsy surgery candidates and improve outcomes in patients receiving neurosurgical treatment for focal-onset, non-lesional epilepsies. ■

(continued from page 1)

The invasive evaluation of epilepsy includes intraoperative mapping using electrocorticography and cortical mapping performed on the awake patient or extraoperative monitoring in a specialized with implanted indwelling electrodes.

The two primary types of electrodes utilized are depth electrodes (DE) that are within the brain parenchyma and subdural electrodes (SDE) which are placed over the surface of the brain.

DE have been used mainly to define temporal and inferior frontal lobe pathology. The main advantage is that they are stereotactically inserted through a twist drill hole, thereby avoiding a craniotomy. The main disadvantage is the limited amount of brain area analyzed with a single DE.

Cortical SDE include both grid and strip configurations and can be placed in patients of any age. Because of the large amount of information that can be obtained and because of the ability to stimulate individual electrodes and thereby map eloquent areas of cortex while in the epilepsy monitoring unit, SDE have become the primary instrument used to evaluate the epileptic patient.

Surgical Intervention

Based again on the extent of the findings, location of the focus, and relation to eloquent areas of cortex, the choice of surgical procedure can be made and tailored to the individual patient. The ideal indication for surgical intervention is the patient with disabling seizures that are refractory to multiple AEDs and that originate in a well-defined region within functionally silent cortex.

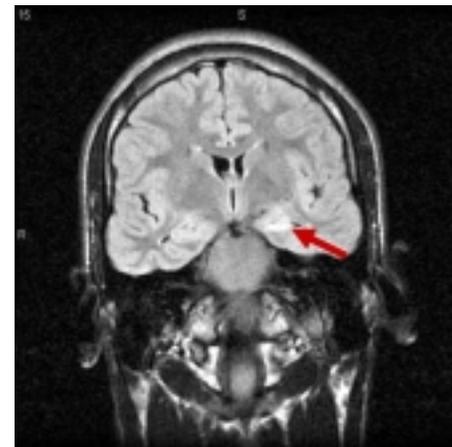
Resection of a cortical lesion in either a temporal or extratemporal location can provide excellent seizure control and is ideal. In cases without a clearly localized focus a disconnection procedure such as a corpus callosotomy or multiple subpial transections may benefit the patient, although the results are often simply palliative. The variety and diversity of surgical techniques are described below.

Temporal Lobectomy

Mesial temporal sclerosis (MTS) is one of the best characterized and treatable epileptic syndromes. Postoperative cure (with or without continued need for medications) or significant improvement ranges from 60-80%. In select populations, seizure-free outcomes of 90-100% have been reported.

In a recent study, in the *New England Journal of Medicine*, surgery decreased the mortality and morbidity of patients with medically intractable temporal lobe epilepsy as compared to continued medical therapy. There were no deaths in the operated patients, but sudden death in the medically intractable epileptic is a well-known phenomenon. Furthermore, in children, neuropsychological outcomes can be improved after temporal lobectomy, shown in one study, of an average 10-point gain in IQ seen in children after surgery.

The potential for major morbidity with temporal lobectomy is associated with the location of the brainstem and optic radiations. The total incidence of risk from surgery does not exceed 5-8%. Although the morbidity with temporal lobectomy can be disastrous, many have come to recognize that the benefits of temporal lobectomy outweigh its risks in many patients.



Coronal FLAIR MRI scan of a 13 year old with intractable seizures and left medial temporal sclerosis (MTS). The arrow is pointing at the hippocampus with the high signal characteristic of MTS.

Extratemporal Resections

Children are more likely than adults to undergo extratemporal seizure focus resections since developmental abnormalities of the cortex are more likely to present at an early age. With improvements in both the noninvasive and invasive methods of localizing the epileptic abnormality, extratemporal resection has become a more viable method for children with medically intractable seizures. Lateralization is often achieved during the preoperative evaluation and is then correlated to the functional imaging and to subdural electrodes during extraoperative evaluations prior to resection.

Unfortunately, results from the resection of extratemporal lesions have not been as good as the results from the resection of temporal lobe foci. Patients with frontal lobe lesions fare better than patients who undergo resections in the parieto-occipital lobes.

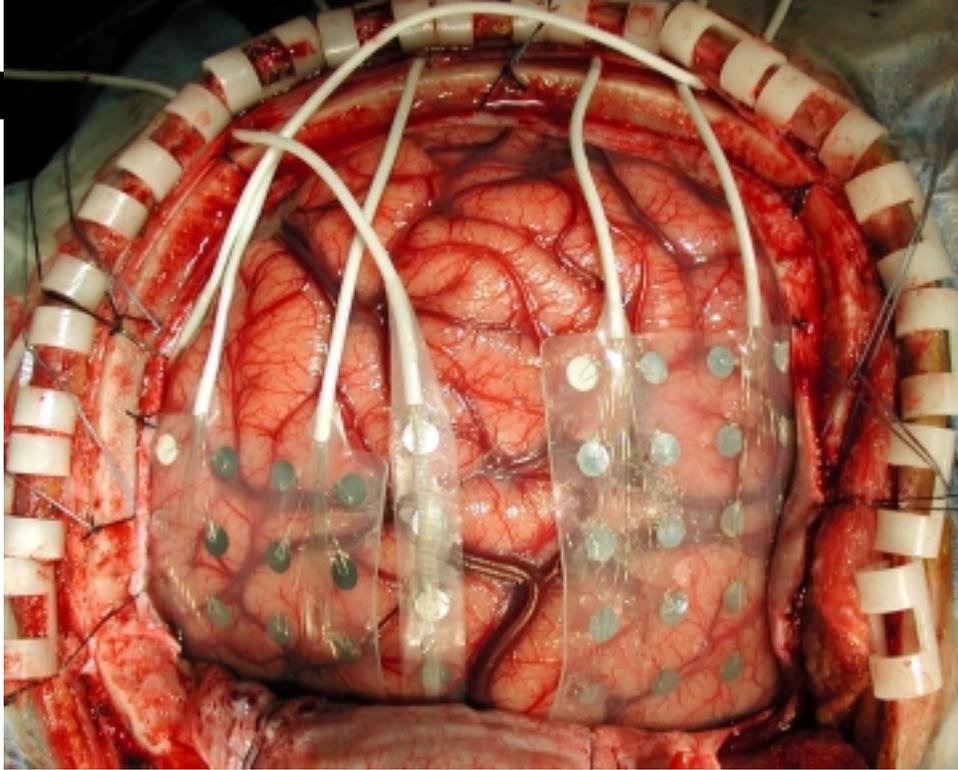
The reason for the improved outcome with frontal lobe areas as opposed to parieto-occipital lesions may be due to two factors—the inability to map eloquent functional cortex in the parieto-occipital region and the fact that visual defects may be more difficult to overcome than motor deficits. In children, the plasticity of the developing brain appears to allow for excellent recovery often within 6-9 months of major neurologic deficits.

Cerebral Hemispherectomy

Children with congenital or acquired hemiparesis secondary to porencephaly or focal/hemispheric malformations such as hemimegalencephaly or Sturge-Weber syndrome, with diffuse hemispheric seizures



Dr. P. David Adelson (left) applies electrodes to a patient in the operating room



Intraoperative picture of subdural electrodes placed on the surface of the exposed brain. The electrical contacts can be monitored for seizure activity, particularly in cases of cortical abnormalities where the seizure focus can be localized.

or multifocal unilateral seizures and a normal contralateral hemisphere may be candidates for a cerebral hemispherectomy. Many of the children have severe, “catastrophic” epilepsy with hundreds of seizures per day and have immature neurocognitive development due to the frequent number of seizures and multiple medications they are on to gain any modicum of relief.

Useful adjunct tests include PET and SPECT scans and somatosensory evoked potentials (SSEP), tests that demonstrate normal blood flow to the functionally “good” hemisphere and absent SSEP responses and poor flow to the injured epileptogenic hemisphere.

This drastic surgical approach is justified by the empirical observation that children experience dramatic seizure control and improved psychosocial functioning after removal of one entire hemisphere of their brain. These children usually recover significant motor function over the 6-9 months post operatively, running, playing and involvement in a standard classroom and overall are with a weak hand (difficulty with fine motor movement) and a foot drop.

Corpus Callosotomy

In patients with atonic seizures (drop attacks), the corpus callosotomy interrupts the focal seizure spread through the brain eliminating the bisynchronous epileptic discharge through the corpus callosum that can result in devastating and frequently

harmful falls. Interruption of this pathway can reduce or eliminate this seizure type in 70-100% of cases, eliminating injury, and improving quality of life.

Although the drop attacks can be minimized, these patients are frequently not seizure free since the source of the seizures is not removed. In some cases, this procedure is combined with later resective surgery once a focus is identified or with a VNS to reduce the partial complex seizure component of the seizure syndrome.

Multiple Subpial Transections

Multiple subpial transections (MST) is a procedure designed to treat focal epileptic areas that are located in unresectable “eloquent” areas of the cerebral cortex. By interrupting the corticocortical connections, MST isolates the seizure focus and prevents its spread to adjacent neocortex.

Since functionality is based on the columnar organization of the cortex, interruption of the communicating horizontal fibers helps reduce horizontal spread of epileptogenic activity along cortical neurons without causing major functional impairment.

Vagal Nerve Stimulation

Perhaps the newest and most exciting area of investigation in the surgical treatment of epilepsy is the use of VNS. The VNS is approved for patients with refractory complex partial seizures not amenable to surgical resection. Unlike the procedures described

above, it does not ablate a seizure focus, nor anatomically disrupt a functional connection from epileptogenic cortex to surrounding cortex; the VNS is neuromodulatory and has been considered another type of AED and an adjunct to medical therapy.

While the mechanism of action of VNS is not well understood, it is thought that the retrograde electrical stimulation of the vagus nerve decreases the sensitivity of the brain to the conditions or stimuli that trigger seizures, possibly by increasing the degree of inhibition or decreasing the degree of excitation in the CNS.

The VNS system consists of an implantable pulse generator and stimulation leads with unique helical electrodes. Together, these deliver programmable pulse trains to the left vagus nerve continuously 24 hours a day.

The pulse generator is placed in the subclavicular area and the vagal nerve electrodes are placed in the left carotid sheath. A hand-held magnet can be used to activate the generator transcutaneously as soon as the patient experiences an aura or seizure. The generator can be programmed externally with a wand attached to a PC to adjust frequency, output current, pulse width, signal time on and magnet parameters. The implanted battery is expected to last 7 to 10 years and can be replaced without changing the electrodes around the vagus nerve.

Outcomes of VNS have been encouraging, with a reduction in seizure frequency of more than 50% in 50% to 75% of patients. Adverse events are mild and occur mainly during stimulation and include hoarseness, throat and stomach paresthesias, and coughing. Complications have included wound infection, ipsilateral vocal cord paralysis, temporary left facial paralysis, and only rarely myocardial infarction.

Conclusion

Neurosurgeons often involve themselves early in the evaluation and management of patients with epilepsy. Surgery should be viewed as an adjunctive therapeutic option for patients with difficult to control epilepsy.

After a reasonable trial of several AEDs has failed to provide adequate seizure control, the diagnosis and surgical alternative for the patient’s epilepsy can potentially lead to complete or improved seizure control, improved neurologic development and avoidance of the potential significant morbidity and mortality associated with intractable seizures. ■

Selection of the pediatric patient for epilepsy surgery

by Patricia K. Crumrine, MD

Departments of Neurology and Pediatrics

The thought of performing surgery on a young child's brain is a daunting concept for many parents to consider when faced with the fact that their child has a seizure disorder that is unlikely to respond to medical management.

The problems facing the treating neurologist are: 1) deciding when the child has failed medical management, 2) knowing there is an underlying lesion serving as an epileptogenic focus until removed, and 3) guiding the family through the decision-making process and assuring they understand the evaluation process, possible risks and likely outcomes.

Families and caregivers need to understand that repeated seizures may have adverse effects on cognition and behavior and that many children will lose cognitive skills after years of uncontrolled seizures. They also need to understand that the pediatric brain has greater plasticity and will tolerate surgical interventions better than at older ages.

The criteria for selecting a child for epilepsy surgery is very similar to the criteria for an adult. For patients with nonlesional epilepsy, surgery should be considered after failure of two or more appropriate antiepileptic drugs, used at doses that yield therapeutic levels, or used to levels that produce dose-related side effects. Kwan and Brodie have shown that the likelihood of achieving seizure control for a 3rd antiepileptic drug is less than 5%. In those patients with lesional epilepsy, (e.g. infants with hemimegencephaly), the time frame for surgery may be much shorter.

There are published reports of the results of epilepsy surgery in children from the 1950's that document the successful outcome of the procedures and the lack of complications. Duchowny et. al. published the results of surgery in 61 children aged 28 days to 36 months with 61% becoming seizure free. Similar percentages were reported by Gilliam, Avellino, Guerreiro, and Koh in children with tuberous sclerosis. Children with cortical dysplasias have about a 50+% chance of achieving a seizure free state after epilepsy surgery. The results for those with temporal lobe epilepsy is similar to the adult literature with 75-80% achieving a seizure free state.

The evaluation for epilepsy surgery generally involves a noninvasive period (Phase I), possibly an invasive period (Phase II), surgery (Phase III), and a follow-up period (Phase IV).

The Phase I evaluation is the period where there is an attempt to lateralize and localize the seizure onset. This phase includes prolonged video EEG monitoring from scalp electrodes with reduced

antiepileptic drugs and attempts at capturing typical clinical seizures.

Anatomical and functional imaging to obtain concordant evidence of brain dysfunction with the EEG information. Such studies may include single photon computerized tomography (SPECT), both interictal and ictal; positron emission tomography (PET), usually interictal, MRI of the head; neuropsychological and language evaluations.

For those children who are old enough and cooperative enough an intracarotid amyltal test (WADA) for language and memory lateralization may also be performed.

Another recent tool that has been shown to be useful is magnetoencephalography (MEG) where the spike focus dipole is localized.

If there is concordant information for these various tests, then the patient may be able to proceed to a surgical resection without undergoing an invasive monitoring phase. This is most often the case for children with mesial temporal lobe epilepsy and evidence of a lesion within mesial temporal structures.

Phase II studies are necessary when there is not concordant information from the Phase I evaluation and the locus of the seizure is uncertain. This evaluation requires the surgical implantation of electrodes into brain areas thought to be the source of the seizures.

Electrodes can be put into brain parenchyma (depth electrodes), on the surface of the brain (subdural electrodes) or a combination of the two forms. The patient is then monitored with EEG until there are enough seizures to determine the focus. It may also be necessary to use these electrodes to map out eloquent brain regions for speech and motor functions.

If the seizure focus can be determined from the Phase II evaluations the patient, family and caregivers can be offered a surgical resection. Surgical considerations may include: focal resections of specific areas, partial lobes (temporal, frontal), removal of part or whole hemisphere, disconnection procedures (subpial transactions and callosotomies).

Class I or 2 outcomes (Engel) are generally as follows: temporal lobe resections – up to 75%; callosotomy – up to 80%; hemispherectomy – up to 75%; focal cortical resections – 50-70%.

Epilepsy surgery is a definitive treatment for many children with intractable epilepsy. The earlier that the surgery is performed, the better the long term outcome relative to cognition and behavior. ■

Recent Donations

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Robert Lijestrand
Janet Lijestrand
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• **Greater than \$50,000:**

Elekta Inc.

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Sara Hobby

Pollack Named Neurosurgery Chief at Children's

Ian Pollack, MD, has been appointed chief of the Division of Pediatric Neurosurgery at Children's Hospital of Pittsburgh. Dr. Pollack is professor of neurosurgery at the University of Pittsburgh School of Medicine and is co-director of the University of Pittsburgh's Brain Tumor Center. He also holds the Walter Dandy Professorship in Neurosurgery at the medical school. Dr. Pollack has been a key member of the neurosurgery team at Children's Hospital since 1992.

A. Leland Albright, MD, chief of the division since 1992, will remain at Children's and continue his medical pursuits. He simply has decided to step down from the post. Dr. Albright holds the Children's Neurosurgery Chair, which will bear his name at the time of his retirement.

Resident Graduation Dinner

A special graduation dinner was held June 26 at the Fox Chapel Golf Club honoring **Elad Levy, MD, Elizabeth Tyler-Kabara, MD, PhD** and **Richard Spiro, MD**, for their successful completion of the seven-year neurosurgery residency program at the University of Pittsburgh.

Dr. Levy is headed to the University of Buffalo to pursue endovascular surgery; Dr. Tyler-Kabara has accepted a pediatric fellowship at the University of Alabama-Birmingham; and Dr. Spiro has accepted a spine fellowship here at the University of Pittsburgh.

Acoustic Neuroma Training Course Offered Online

The Department of Neurological Surgery in conjunction with the University of Pittsburgh's Center for Continuing Education in Health Science is offering an online CME training course discussing the treatment options for acoustic neuromas and the efficacy and applicability of Gamma Knife surgery. The course is presented by **Douglas Kondziolka, MD, L. Dade Lunsford, MD** and **John C. Flickinger, MD**. Interested physicians can access the course by visiting the CME website at cme.health.pitt.edu and selecting the 'Clinical Issues' link.

New Research Grants

- "Microprobe for Brain Tissue Osmolality Measurements," **Edwin M. Nemoto, PhD**, SBIR/NINDS (\$160,733).

Media

- The Children's Miracle Network, in conjunction with the Children's Hospital Foundation and KDKA, featured **P. David Adelson, MD** and one of his patients on the Children's Miracle Network telethon, June 5. Dr. Adelson's patient was eight years old when he was hit by a car and suffered a severe traumatic brain injury. After several surgeries by Dr. Adelson and rehab at the Children's Institute, the child has made significant gains.

- **Jeffrey Balzer, MD**, was featured in the January/February issue of *Pain Medicine News* regarding percutaneous neuromodulation therapy (PNT) for the treatment of chronic low back pain.

- **John Y.K. Lee, MD**, was featured on WQED-TV's "Focus on Pennsylvania." The segment, spotlighting young physicians in Pennsylvania, aired on March 26.

Promotions

- **C. Edward Dixon, PhD**, was promoted to professor.
- **Ajay Niranjana, MS**, was promoted to assistant professor.

Announcements

- **Dr. Lunsford**, was a visiting professor at Johns Hopkins University in Baltimore, MD on March 25. Dr. Lunsford spoke on "Radiosurgery for Acoustic Neuromas."

- **Jeffrey Balzer, PhD**, was appointed chairman of the American Board of Neurophysiological Monitoring.

- **Eric Altschuler, MD, Robert Baker, II, DO, Michael Moncman, MD** and **David Zorub, MD** have been named clinical associates at the University of Pittsburgh.

Honors and Awards

- **Dr. Albright** was honored by *EP (Exceptional Parent Magazine)* for his work with children with disabilities June 29 at PNC Park prior to the Pittsburgh Pirates game as part of Disability Awareness Night.

- **Dr. Kondziolka** was honored as the Canadian Neurosurgical Society, Penfield Lecturer, June 11, at the Canadian Congress of Neurosurgical Sciences meeting in Calgary, Canada.

Welcome

- **Christine White**, grants manager; **Amber Hindman-Kyles**, grants administrator; **Tracey Germany** part-time secretary for Dr. Adelson; **Brent Barbe**, Dr. Nemoto research assistant.

- **Richard Singelton, MD, PhD**, PGY-1 resident; **Hilal Kanaan, MD**, PGY-1 resident; **Dean Kostov, MD**, PGY-1 resident; **Joseph Ong, MD**, PGY-5 resident.

Congratulations

- Baby girl (Emily Paige, April 30) to **Eleanor Carson-Walter, PhD** and husband **Kevin Walter, MD**; baby boy (Jackson Anderson, June 15) to **Jonathan Engh, MD** and wife Kelley.

Upcoming Events

- September 10-11: **Minimally Invasive Endoscopic Surgery of the Cranial Base and Pituitary Fossa Course**. Series of lectures discussing approaches for endoscopic surgery of the cranial base and pituitary fossa. Contact Melissa Hawthorne at (412) 647-6358.

- September 20-24: **Principles and Practice of Gamma Knife Radiosurgery**. Training course targeted at neurosurgeons, radiation oncologists and medical physicists interested in Gamma Knife radiosurgery education. Next course is November 15-19. Contact Charlene Baker at (412) 647-6250.

- September 27-29: **Gamma Knife Radiosurgery Training for Nurses**. Training course directed at nurses and other allied health care personnel providing clinical care for patients undergoing Gamma Knife radiosurgery. Contact Charlene Baker at (412) 647-6250.

- November 7-9: **Stereotactic Neurosurgery In Your Practice Training Course**. Two-day training course designed for neurosurgeons and their staff with an interest in growing their practice in neuro-oncology and functional neurosurgery. Held in Las Vegas, NV at the Four Seasons Hotel. Contact Kristie Maple at (412) 647-9539. ■



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Third Gamma Knife unit placed into operation at UPMC; patient areas expanded

Only clinical site in world with three operating units; center has largest patient volume in United States

The University of Pittsburgh Medical Center's Department of Neurological Surgery placed into operation its third Gamma Knife unit for brain radiosurgery on May 5 becoming the only clinical site in the world with three operating units. The addition of this third unit further establishes the Center for Image-Guided Neurosurgery's stature as a world-leader in treating brain disorders.

The robotic technology utilized with the Gamma Knife unit represents one of the most advanced means available to treat deep-seated vascular malformations, brain tumors, and selected patients with pain, movement disorders, or epilepsy once considered inoperable. The treatment is advantageous because it does not require an incision to 'expose' the lesion.

Since the first Gamma Knife unit was installed at UPMC Presbyterian in 1987—the first unit installed in North America—over 6,300 patients from all over the world have undergone treatment here. The Center for Image-Guided Neurosurgery has a higher patient volume—now exceeding 700 patients per year—than any other center in the United States.

In addition to patient care, the center is a highly-regarded international training center for Gamma Knife radiosurgery, holding several University of Pittsburgh CME-accredited training courses.

Along with the additional unit, the Gamma Knife suite was expanded to nearly twice its previous size. A new reception area was added along with new patient preparation rooms, consultation suites and a new training area. ■

