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***Neurosurgery benefits some with recurrent epileptic seizures

The University of Texas Health Science Center at Dallas, Texas T5235 (2)4)688-3404 The University of Texas Health Science Center at Dalles 5323 Harry Hines Boulevard Dalles, Texas T5235 (214) 668-3404 DALLAS--Twenty pills a day couldn't suppress 18-year-old Keith's epileptic seizures. The medication blurred his thinking, dulling his personality. Averaging eight seizures a day, he suffered the crippling embarrassment of losing control of his body in public.

Keith's seizures ended recently when a pecan-sized, grey lump was surgically removed from the left side of his brain. Laboratory analysis revealed the growth was not cancerous. It was a blood vessel abnormality probably present from birth.

Neurosurgeon Dr. John Mullen, epilepsy specialist at The University of Texas Health Science Center at Dallas who performed the surgery, says that brain surgery can benefit about half the epilepsy patients whose seizures don't respond to anti-convulsant drugs. Of the two to four million people in the U.S. living with chronic recurrent seizures, one tenth can be helped with surgery, he says.

Mullen is one of a small group of neurosurgeons in this country with extensive training in surgical procedures to locate and remove epileptogenic (seizure-producing) tissue. Multiple electroencephalograms (EEGs) are used both prior to and during surgery to identify irregular brain waves and to locate the focus of the seizures. In Keith's case, Mullen says the growth itself had not produced the seizures. It was damaged tissue around the growth that had erratically discharged electrical activity throughout the brain.

"Highly epileptogenic tissue is not functioning brain and will only produce a worsening of symptoms if left alone," says Mullen.

Surgery begins after lengthy testing has determined the location of the speech and other vital centers. These sensitive areas are carefully avoided during surgery. A small section of skull is removed and 16 tiny electrodes (silver balls encased in gauze) are placed on the surface of the brain. Each ball is attached to a nickel chromium wire, which is woven into a braided headpiece and attached to an EEG machine. This procedure, called "electrocorticography," detects and records on paper the brain waves of tissue under each ball. Slower waves indicate the presence of a tumor (growth) in the underlying brain, while abnormal spikes reveal epileptogenic tissue.

The EEG is used to guide the surgery, says Mullen, and to define the lesioned areas and indicate how much tissue should be removed.

After the epileptogenic tissue has been removed, the skull flap is replaced and the patient is closely monitored for the next few weeks to check for recurring seizures. In cases in which they persist, implantable electrodes can be placed in the brain and worn up to three weeks to help identify additional epileptogenic sites. Depth electrodes are sometimes used for lesions that are deep within the brain, locating seizure-causing sites when surface electrodes cannot.

Neurosurgery for epilepsy--add one

Epilepsy is related to head injury, infection, genetic malformation, disease, poor nutrition and a number of other causes. Seizures can happen to anyone, yet in spite of that fact, social rejection is often far more damaging than the disease itself. Keith, like other victims of epilepsy, lived with the pain of job discrimination and the knowledge that people feared him because of his seizures.

Patient selection for neurosurgery is based on an unresponsiveness to drugs and to the type of seizures. Seizure disorders amenable to surgery are commonly of the type termed "partial," meaning they emanate from a part of the brain rather than being a generalized discharge throughout the brain. Partial seizures usually involve mental confusion followed by pointless movements (chewing, hand-rubbing, wandering), dizziness or irritability--depending on the area of the brain that is stimulated. This type of seizure is occasionally mistaken for alcohol or drug abuse. "Temporal lobe epilepsy" constitutes the majority of partial cases treatable by surgery. The two temporal lobes of the brain, one on either side above the ear, control memory. If one is diseased, resulting in seizures, it usually fails to function and the other temporal lobe serves for the two, says Mullen.

Partial seizures often produce an "aura," which is a prelude or warning of a seizure and is the first sign of abnormal electrical discharge. The aura varies according to the brain area affected. To some people it can mean smelling lemons or hearing a weather report. Keith's seizures would begin when he would hear a small voice inside his head tell him to make an "o" sound. He would produce the sound and his mouth would freeze in an open position. Then he would walk until he found a place to sleep and would remain in a deep sleep for up to two hours. Keith's lesion was located directly under the brain area controlling speech and word comprehension.

Mullen is working toward a comprehensive epilepsy care program for patients with seizure disorders, including medical, surgical and psychological management. Part of his efforts are in conjunction with the local epilepsy support group, the Dallas Epilepsy Association. This and other epilepsy associations offer counseling, information about low-cost medication and the purchasing of medical I.D. bracelets, as well as performing community education services.

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(In Dallas, for information about epilepsy call the Dallas Epilepsy Association at 214/634-8421.)

***Videotape and black and white prints of Dr. Mullen in surgery are available upon request.

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