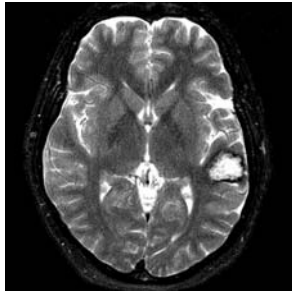
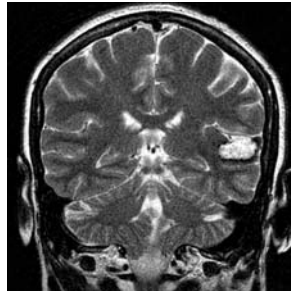


## Case Study:

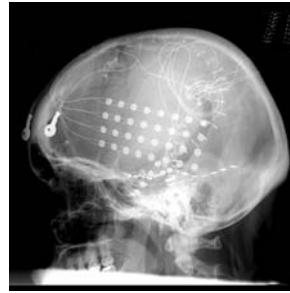
### Awake Craniotomy for resection of cavernous angioma.



▲ Pre-operative  
Axial MRI of Brain



▲ Pre-operative  
Coronal MRI of Brain



▲ Cortical Grid  
Placement



▲ Cortical Grid  
Placement

#### PATIENT HISTORY

The patient is a 32 year old woman with history of seizures since the age of 15. During a typical event she would demonstrate behavior arrest, blank stares, and automatisms in both hands. Each would last 30-90 seconds followed by post-ictal confusion. She had several seizures through out the course of a day. She has tried multiple anti epileptic medications, even in multiple combinations, but without any reduction in seizure frequency, and duration. Due to the epilepsy she could not work, drive, be at the house by herself; she had a very difficult time taking care her two infants.

A recent MRI scan of the brain demonstrated a cavernous angioma involving the posterior part of her left temporal lobe. Neuropsychological testing showed that her IQ was 90. She was admitted to the Brackenridge Epilepsy Monitoring Unit. She underwent video EEG monitoring. She had two episodes captured; both of these subtly suggested that the seizure activity originated in the left temporal lobe, and then spread to the remainder of the left and right hemispheres.

#### DISCUSSION:

Her case was then presented at the monthly epilepsy conference, attended by physicians from the neurosurgery, neurology, neuroradiology, neuropsychology services. Following

this, Intra-carotid Sodium Amytal (WADA) test was then performed, in order to determine language and memory dominance in either the left or the right hemisphere. With left internal carotid artery (ICA) injection, she demonstrated clear impairment with language function. With the right ICA injection, the patient had mild dysarthria but the language function was grossly intact. The memory function was localized more to the right hemisphere.

The next step was a craniotomy for implantation of grids and strips on the right and left cortical surfaces and also implantation of depth electrodes into the medial left temporal lobe. This was done in order to better localize the origin of the epileptiform discharges, and to rule out the amygdala and the hippocampus as possible sites of origin of the seizure activity.

#### TREATMENT:

Following this procedure, she was admitted to the ICU, and was closely monitored with continuous video and EEG recordings. The cavernous angioma and tissue surrounding it were identified as zones of epileptogenicity. Her language area was in close proximity to the cavernous angioma. The goal of any neurosurgical procedure is to restore or improve functionality, whether it is movement, speech, vision, etc. In her case, such an important function as speech shouldn't be sacrificed or

injured in an attempt to cure her of her seizure disorder.

The vast majority of neurosurgical procedures are performed with the patient under general anesthesia. This is done to keep the patient still, to control brain edema, blood pressure, so as to not interfere with any delicate surgical procedures. Given her set of circumstances, given the close proximity of the speech area to the epileptogenic zones, the decision was made to perform an awake craniotomy. She was awake through out the entire procedure, and underwent intraoperative stimulation of the left temporal lobe in order to maximize resection of the epileptogenic regions, and to prevent any injury to her speech function. The cavernous malformation was resected in its entirety, along with all epileptogenic tissue adjacent to it, and the procedure progressed carefully and methodically as her speech area was identified, and any planned area of resection was carefully tested to rule out any possibility that it can have an eloquent function. She was asked to count numbers, recognize objects, and speak through out the resection. This was the first case of an awake craniotomy for brain mapping in the central Texas region.

She tolerated the procedure very well, and discharged home three days later. She did not have any speech dysfunction at the time of discharge and has been seizure free since surgery.

#### **OUTCOME AND FOLLOW UP:**

In the majority of patients with epilepsy, seizures can be well controlled with appropriate medication. However, current estimates indicate that 20 - 30% of patients with epilepsy are refractory to all forms of medical therapy. Although epilepsy surgery involves small risks, these risks do not equal the risks of uncontrolled seizures. The morbidity and mortality of seizures include: accidents (fractures, burns, lacerations, and head injuries), cognitive decline, sudden death; and psychological, social, and vocational impairment.. Sudden unexplained death in epilepsy can reach a rate of 1 death per 500 patients per year. Depression and anxiety are very common among patients with medically refractory epilepsy. These patients are also frequently unable to be employed.

Continued medical therapy after failure to control seizures with aggressive trials of antiepileptic drugs (AEDs) is suboptimal treatment.. In several retrospective trials and one prospective, randomized, controlled trial for a well-defined syndrome with a known favorable surgical outcome, mesial temporal lobe epilepsy, the morbidity and mortality associated with surgery has been demonstrated to be less than that associated with the disorder (Wiebe, 2001; Spencer, 2003; Engel, 2003). In addition, surgery yields a better quality of life and reduced depression and anxiety as soon as 3 months after temporal lobectomy, compared with continued medical therapy (Spencer, 2003).

