



Epilepsy surgery

For Undergraduate

Prof. Ahmad Tamimi
Department of Neurosurgery
University of Jordan



Introduction

- Prevalence of epilepsy; 05-1% of the population
- 50% below the age of 25 years old
- 75% of this group age are below the age of 5 years.
- Mortality is 3 times than the normal population
- Morbidity is 10 times more than the normal population.
- 2/3 of patients are able to be controlled with AEDS, and 1/3 of patient the become resistant for AEDS.(refractory seizure)
- Refractory seizure: Persistent seizures despite appropriate pharmacological treatment(3AEDS, including one of the new generation)
- The most common location of epileptogenic activity in refractory seizure is the temporal lobe.



Presurgical Evaluation

Clinical history;

- Incest of seizure
- One type of seizure
- Multiple type of seizure
- Frequency

-Aura

- Regressive neurological disorder.
- AEDS
- Familiar history(epilepsy, neurological disorders)
- Pathological history(head injury, meningitis,

Hypoxia



Presurgical Evaluation

Clinical Evaluation;

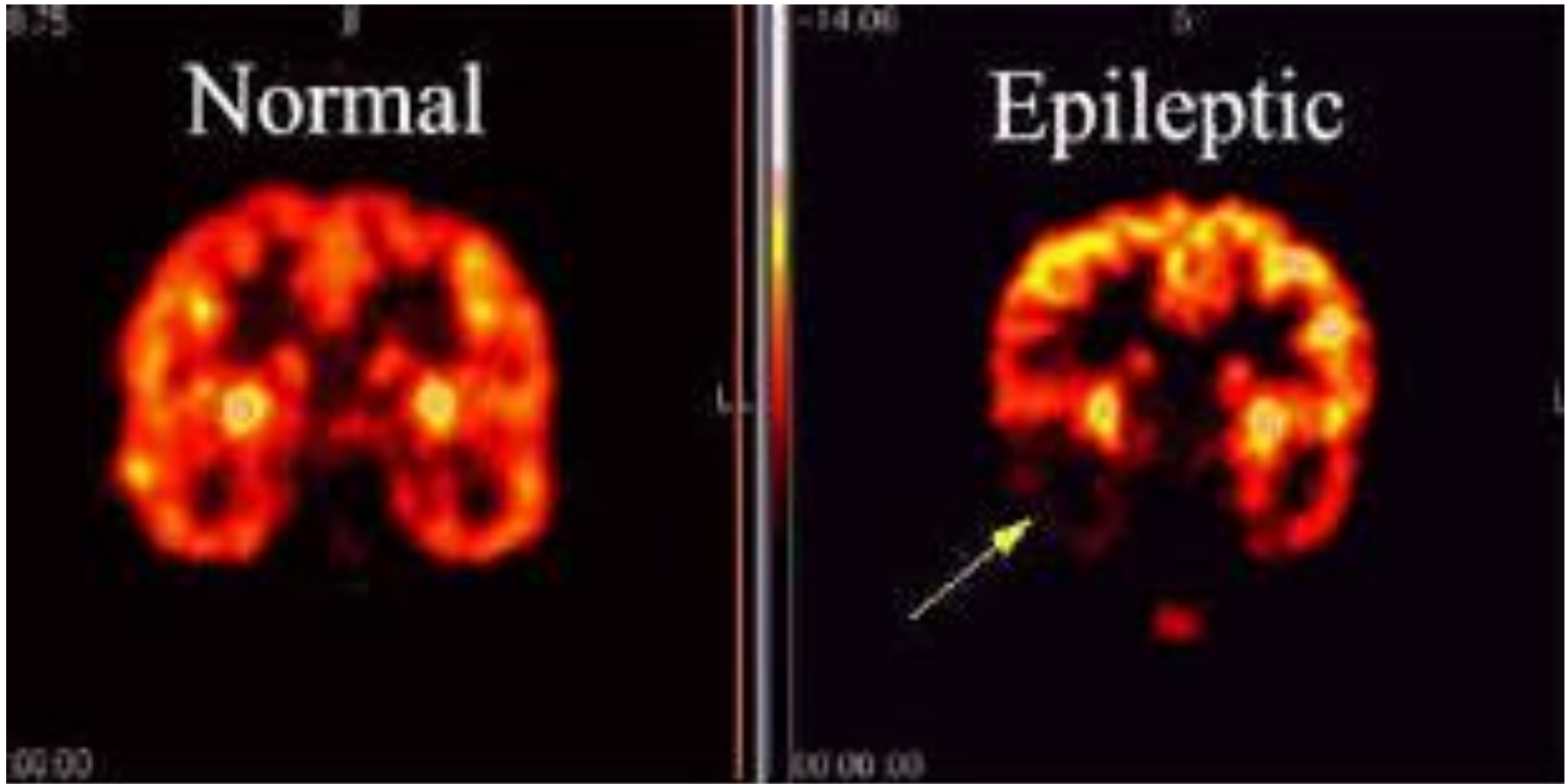
- Neurological examination(Neurological deficit)
- Psychological evaluation(IQ, psychological development)
- Psychiatric evaluation(depression, psychosis, behavioral disorders)



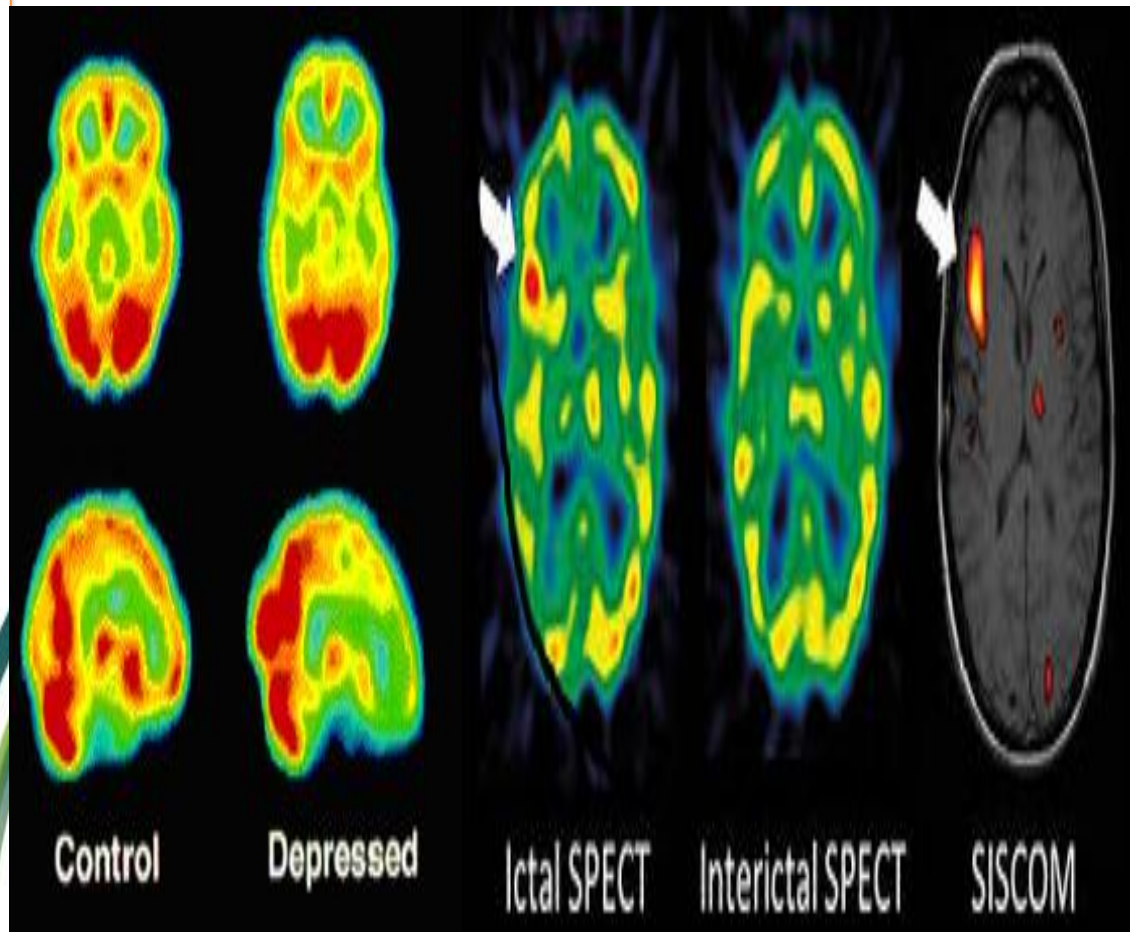
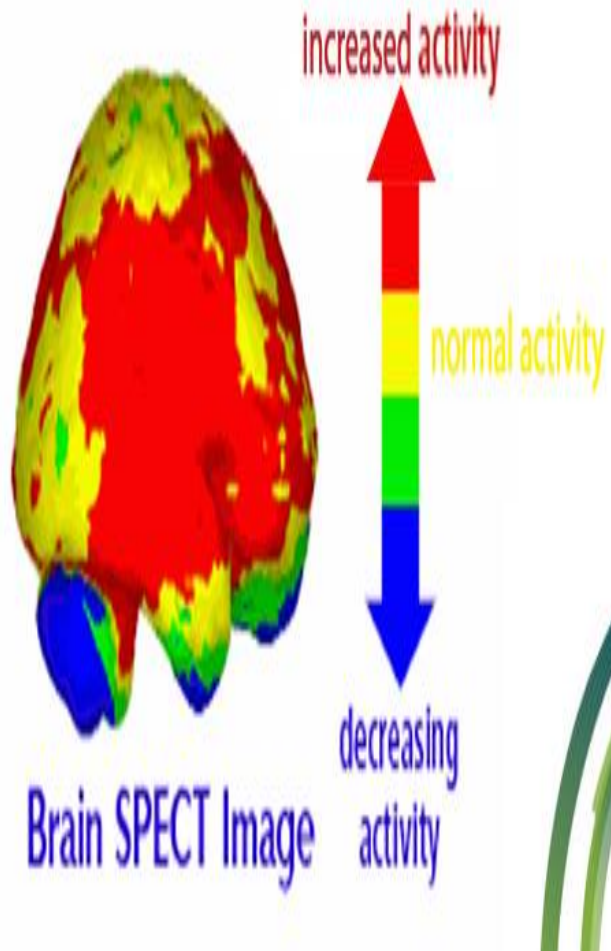
Presurgical Evaluation

- **Brain MRI** ; Epilepsy protocol (Flair, T1, and T2 weighted with 3mm thickness for the temporal lobe area)
- Functional Imaging
 - **PET scan**:
 - hypo metabolism interictally
 - **SPECT Scan** :
 - Hypo perfusion interictally
 - Hyper perfusion ictally

Presurgical evaluation/Brain PET Scan



Presurgical Evaluation /Brain SPECT





Presurgical Evaluation/ Neurophysiologic tests

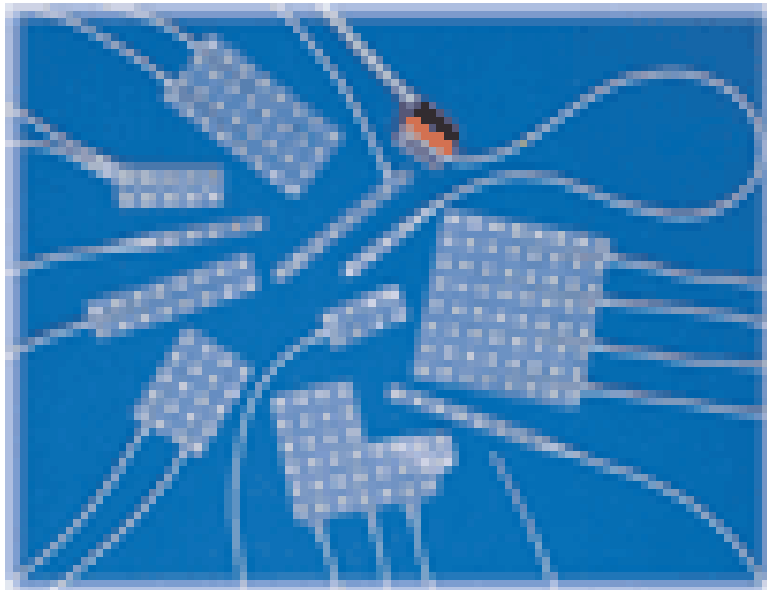
Noninvasive EEG;

- EEG; To confirm epilepsy in epileptic patient , negative EEG, cannot rule out epilepsy)
- Video EEG(confirm epilepsy, detect the epileptogenic foci, the onset of seizure , psychogenic , seizure semiology, interictal and ictal epileptiform discharges.

Invasive EEG ;

- (ECoG, and Deep electrodes insertion) for selected cases)
- Grids and strips, most commonly subdural
 - Parenchymal “depth” electrodes, especially for recording from hippocampus

Presurgical evaluation/Video ECoG





Epilepsy surgery management

- Epilepsy surgery is an multidisciplinary approach, through; epilepsy surgery program or epilepsy surgery unites).
- Epilepsy surgery team include:
 - Adult neurologist
 - Pediatric Neurologist
 - Clinical neurophysiologist
 - Epileptologist
 - Epilepsy Surgeon
 - Technicians

Epilepsy surgery approach should be approved by the team of epilepsy surgery



Types of Surgical Procedures

Resective or curative surgery:

- Organic lesions(Brain tumor, AVM, migratory disorders).

Surgical procedures;

- Temporal lobectomy and amygdalo hippocampectomy.
- Hemispherectomy



Epilepsy surgery / Intraoperative monitoring





Refractory seizure & Temporal lobectomy and amygdalo hippocampectomy.

Indication:

- Unilateral temporal lobe epilepsy or onset of seizure activity
- Migratory disorder
- Mesotemporal sclerosis
- Extensive organic lesion of the temporal lobe.

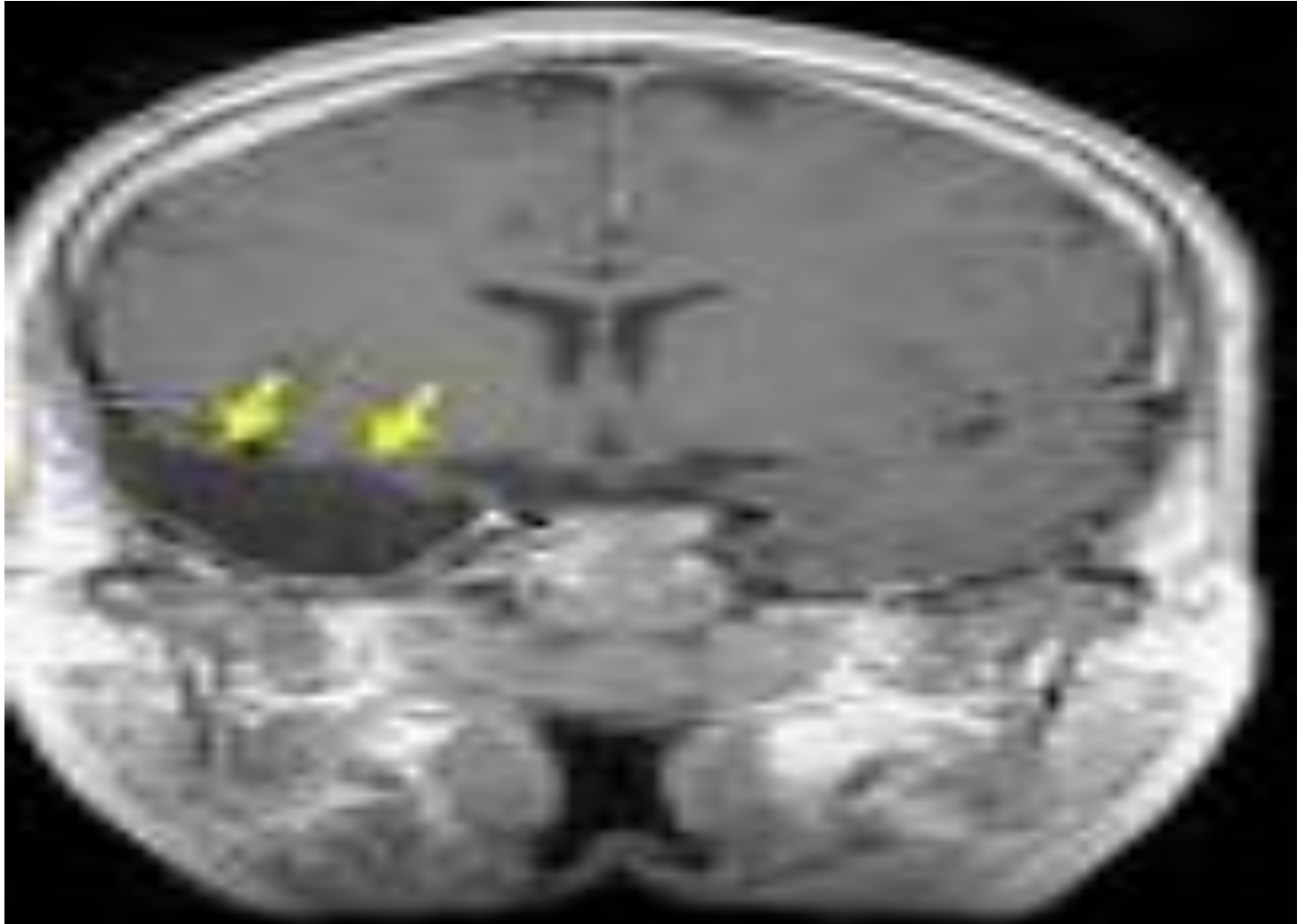
Outcome:

- 80% cure or almost cure.
- 20% partial improvement

Morbidity:

- 12-14% quadrantanopsia
- Memory disturbances

Temporal lobectomy





Refractory seizure & Frontal lobectomy.

Indication;

- Onset foci in the frontal lobe
- Migratory disorders
- Extensive organic lesion

Outcome;

-60% cure or almost cure.



Refractory seizure & Occipital lobectomy.

Indications:

- Onset foci in the occipital lobe.
- Organic lesion

• Outcome:

50% cure or almost cure

Complications:

Homonymous hemianopia



Hemispherectomy

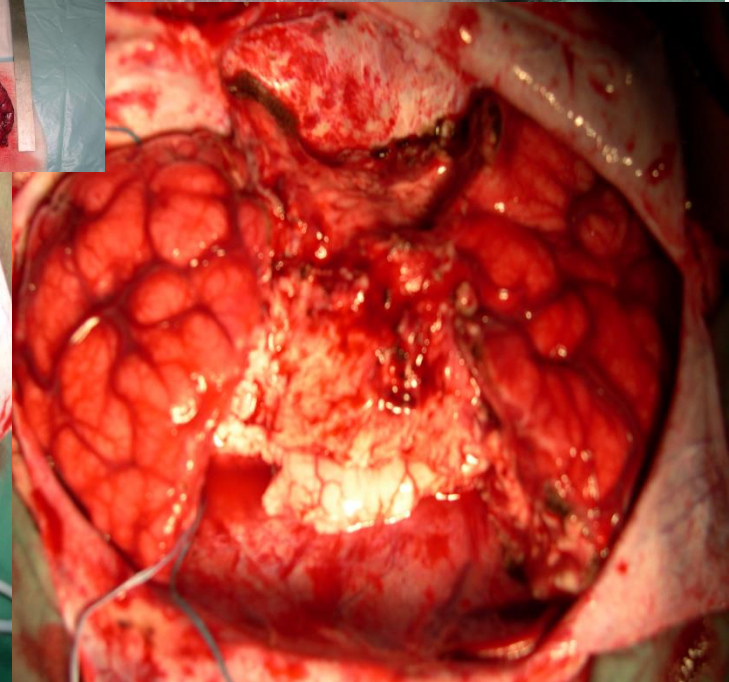
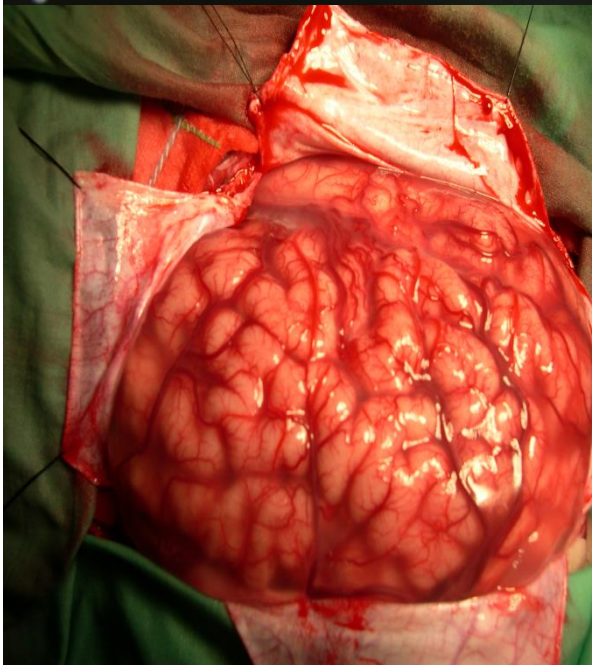
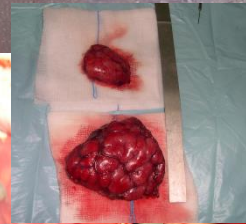
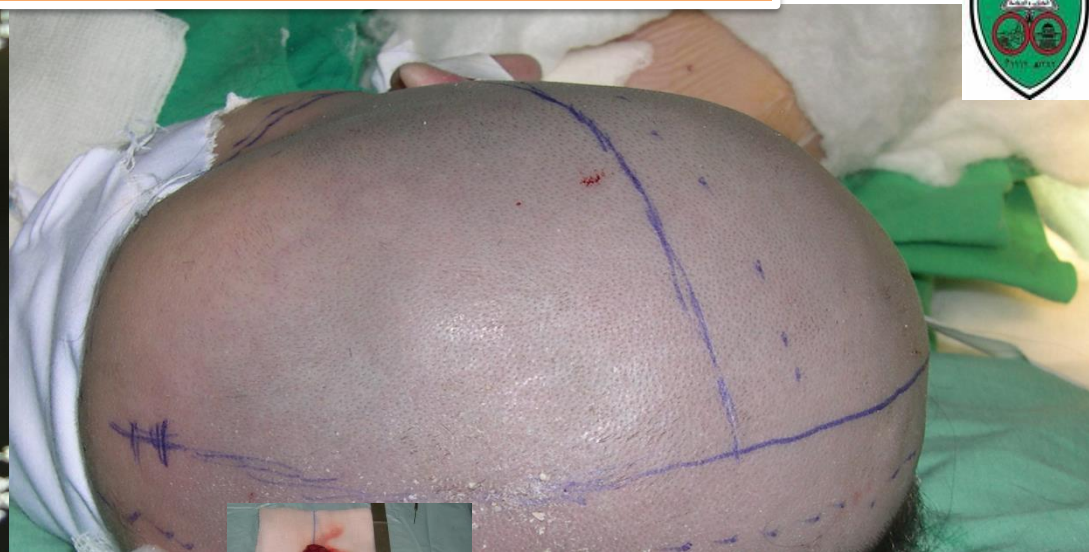
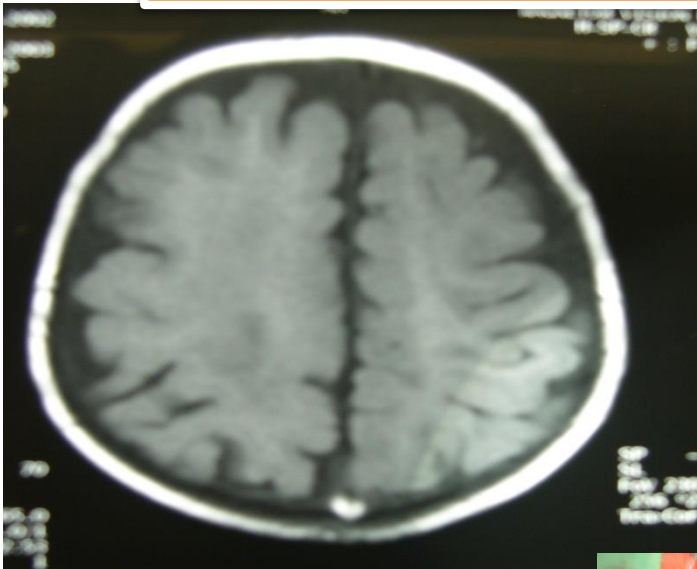
- **Indications:**

- Multifocal seizure
- <8 years old
- Hemimegalencephaly
- Sturge-Weber Disease
- Rasmussen encephalitis
- Lennox-Gastaut Disease

- **Outcome:**

- 50% cure or almost cure.
- **Complications:**
- Hydrocephalus
- Loss of peripheral vision
- Developmental alteration

Functional Hemispherectomy





Epilepsy surgery & Corpus Callostomy (palliative treatment)

Dissection of the anterior
2/3 of the corpus
callosum.

Indications;

- Multifocal seizure
- Drop attacks

Outcome;

- 50% improve in
different grades

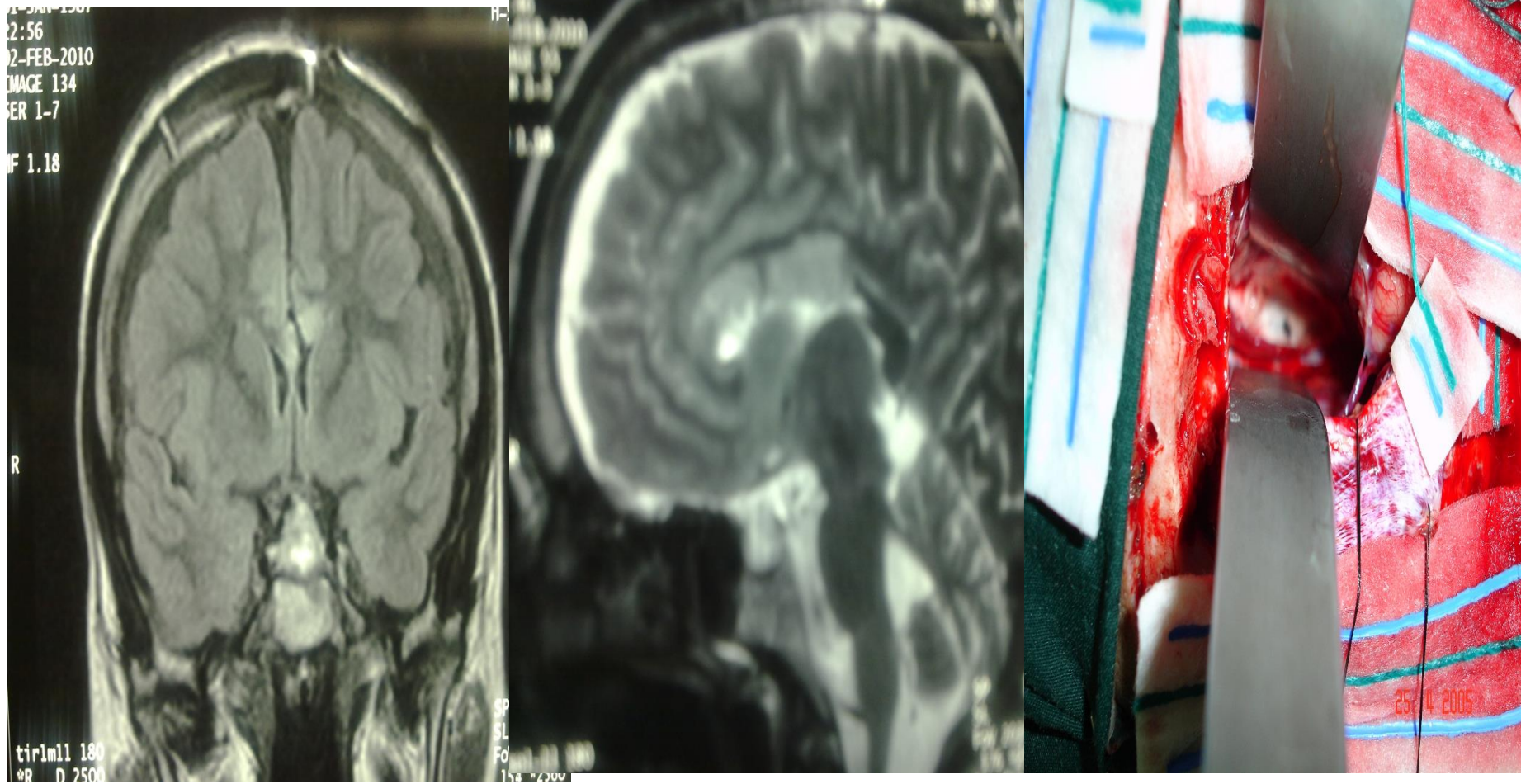
Complications;

- Mutism
- Somato agnsia of none
one lower extremity

Both complications are
transitory.



Callosotomy



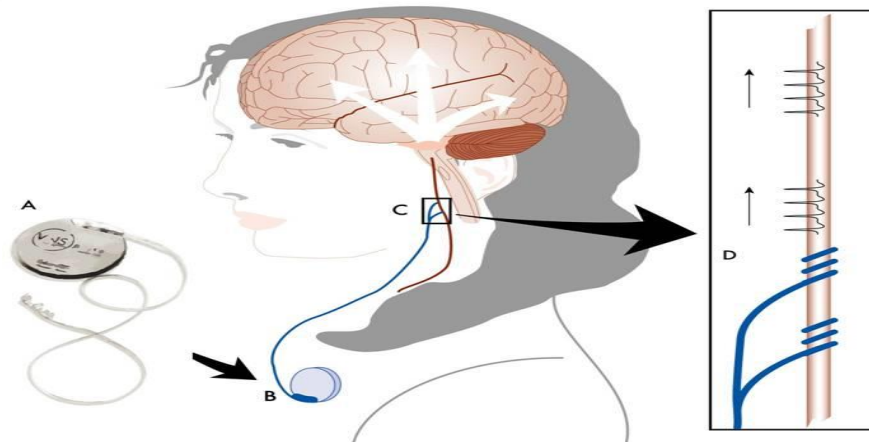
Epilepsy surgery & VNS implantation (palliative treatment)

Indications:

- Multifocal seizure
- Generalized atonic seizure
- Complex partial seizure

Complications:

- Dysphonic
- Respiratory dysfunction
- Cable discomfort



Vagues Nerve stimulator

