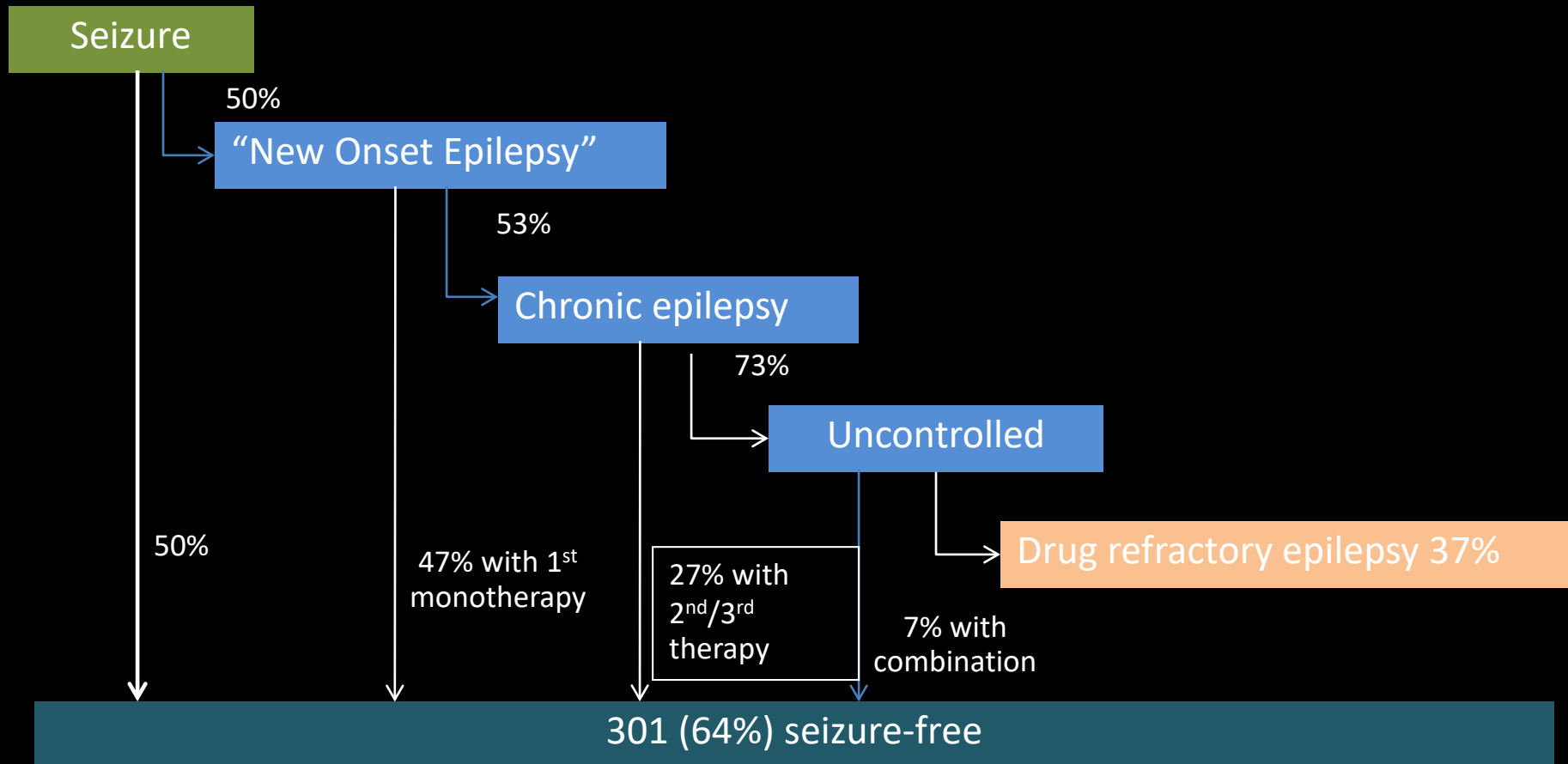


Presurgical Evaluation and Epilepsy Surgery

Teeradej Srikijvilaikul, M.D.
Prasat Neurological Epilepsy Center



Achievement of seizure freedom in newly diagnosed epilepsy (n=470)





Indication

- Intractable to medical treatment
 - Acceptable seizure control cannot be achieved, despite adequate trials with potentially effective drugs, at dose or levels that are associated with no side effects or with acceptable side effects only
 - At least **2** first-line drugs



Differential diagnosis

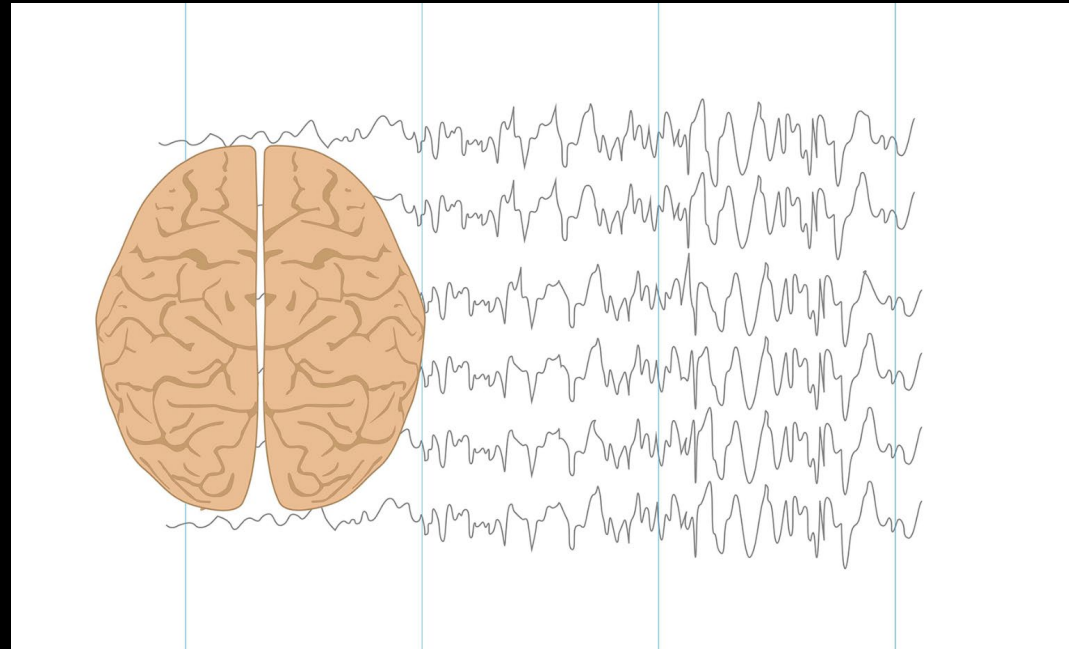
- Wrong diagnosis
- Inappropriate antiepileptic medications
- Not adequate doses
- Poor compliance



Preoperative workup

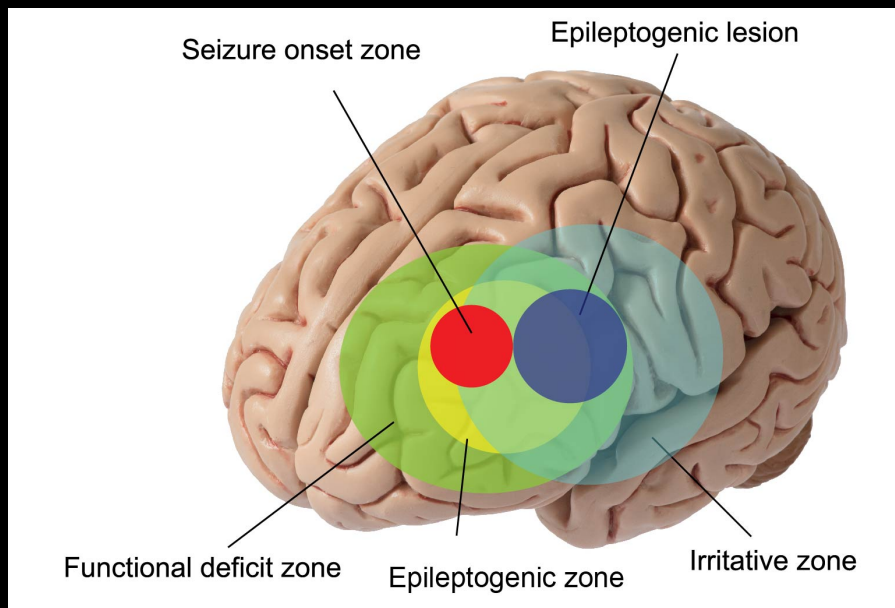
Epileptogenic zone

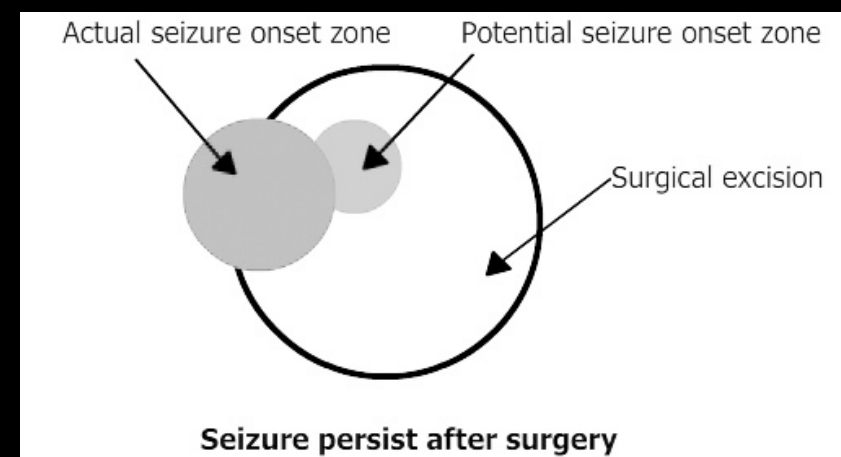
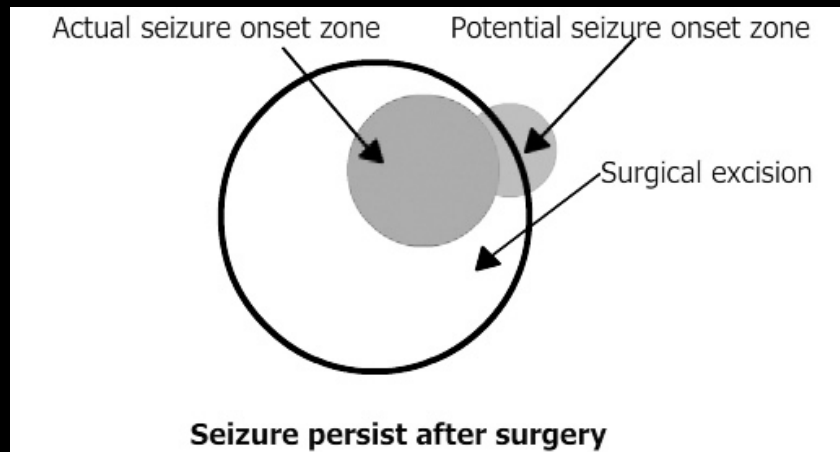
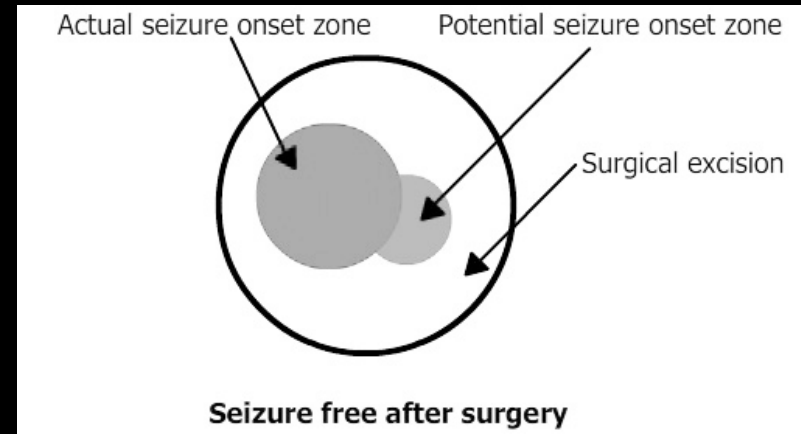
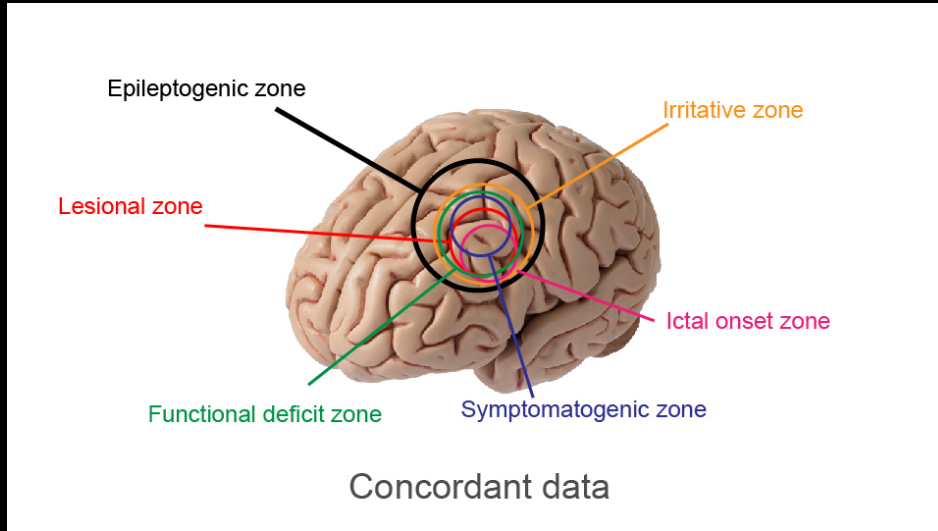
- Location
- Lateralization
- Extent
- Functional cortex



Epileptogenic zone (Zone)

“Area necessary and sufficient for initiating seizures, the removal or disconnection of which is necessary for abolition of seizures”





Principal considerations

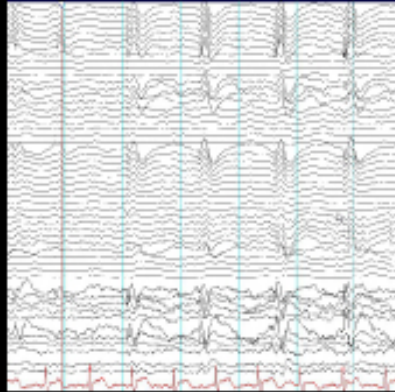
- Epileptogenic zone
- Symptomatogenic zone
- Irritative zone
- Ictal onset zone
- Epileptogenic lesion
- Functional deficit zone



Presurgical evaluations

- H&P
- Routine EEG, 24-hour video EEG, MRI
- Neuropsychological test
- Ictal SPECT, PET, fMRI
- Wada test

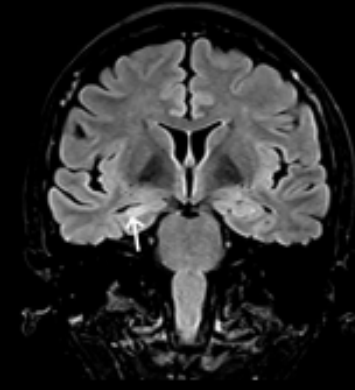




Irritative zone
Ictal onset zone



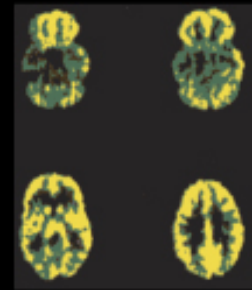
Presurgical evaluation



Epileptogenic lesion



Symptomatogenic zone



Functional deficit zone



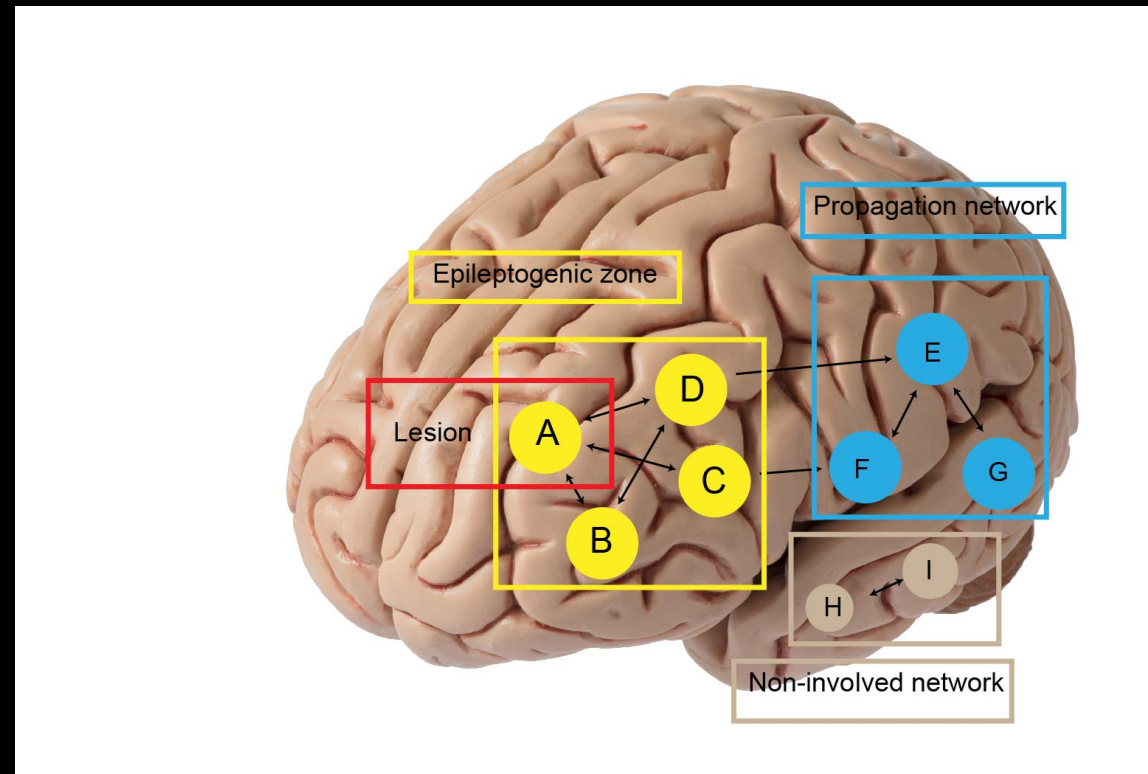
Intracranial EEG

- Intraoperative EcoG
- Subdural electrode
- Depth electrode
- Stereoelectroencephalography (SEEG)



Epileptogenic zone (network)

The site of the beginning and of the primary organization of the epileptic seizures”



Bancaud and Talairach



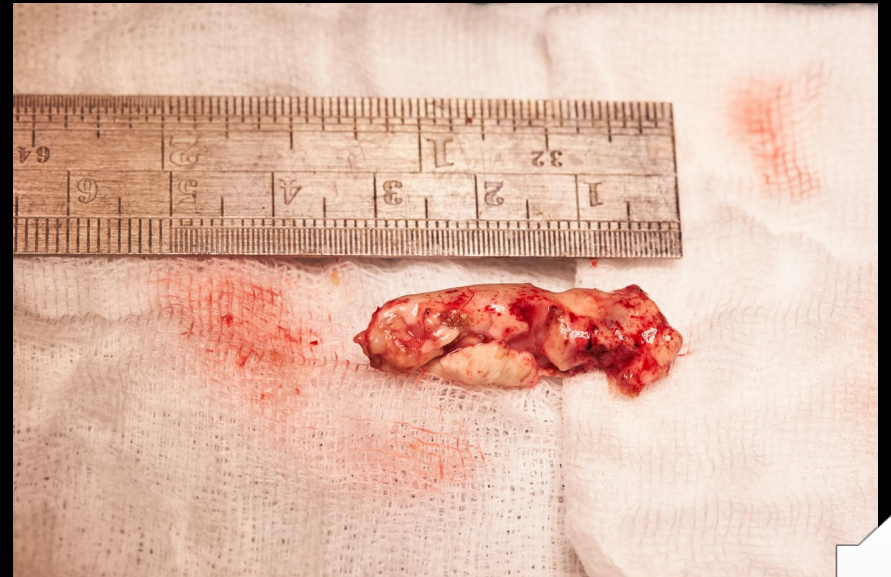
Epilepsy Surgery

- Resection
 - Lesionectomy, topectomy, lobectomy, hemispherectomy
- Disconnection
 - Corpus callosotomy, multiple subpial transection
- Ablation
 - Thermocoagulation, Laser interstitial ablation, Radiosurgery
- Neurostimulation
 - VNS, DBS, RNS (responsive neurostimulation)



Pathological substrates

- Hippocampal sclerosis
- Cortical dysplasia (malformation of cortical development)
- Low grade glioma (DNET, Ganglioglioma, PXA, Astrocytoma)
- Cavernoma
- Etc. AVM, post-traumatic

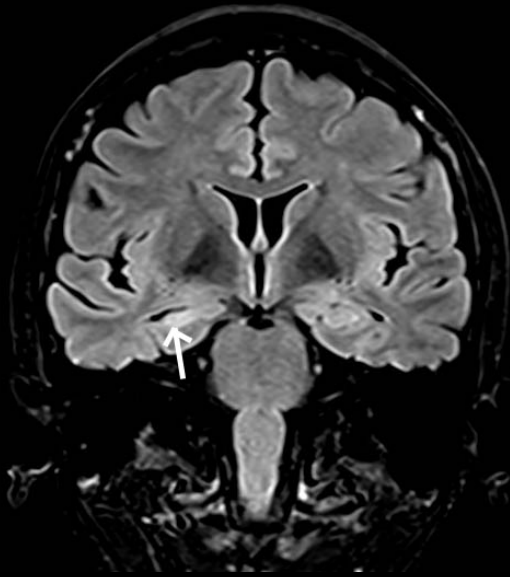


Temporal lobe surgery

- Lesionectomy
- Lesionectomy & intraop EcoG
- Lesionectomy & amygdalohippocampectomy
- Temporal lobectomy



Hippocampal sclerosis



Lobectomy

- Standard temporal lobectomy
- Anterior temporal lobectomy
- Anteromedial temporal lobectomy

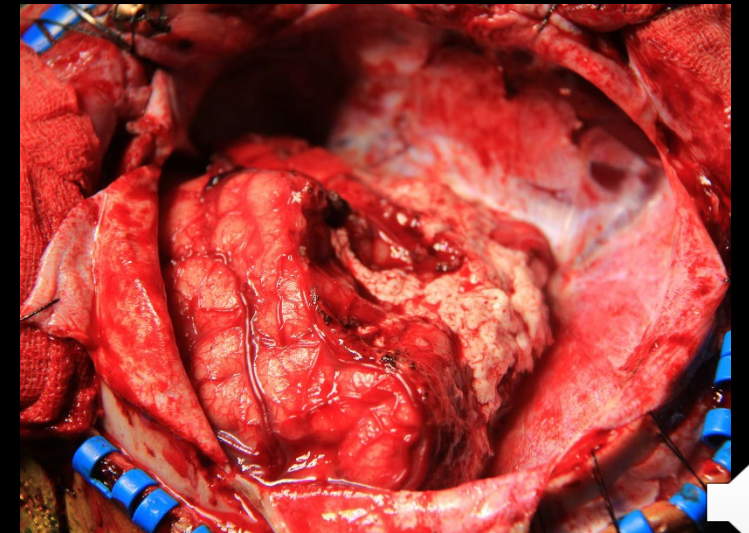
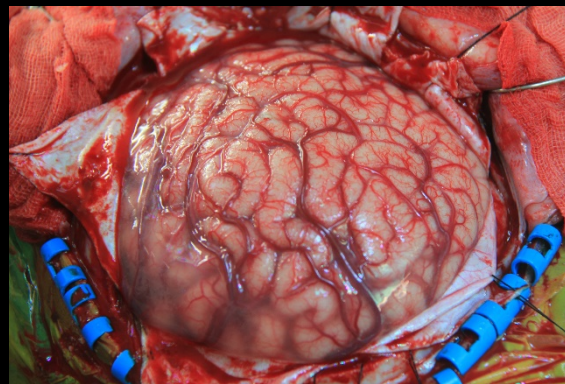
Selective Amygdalohippocampectomy

- Transylvian
- Transcortical
- Subtemporal



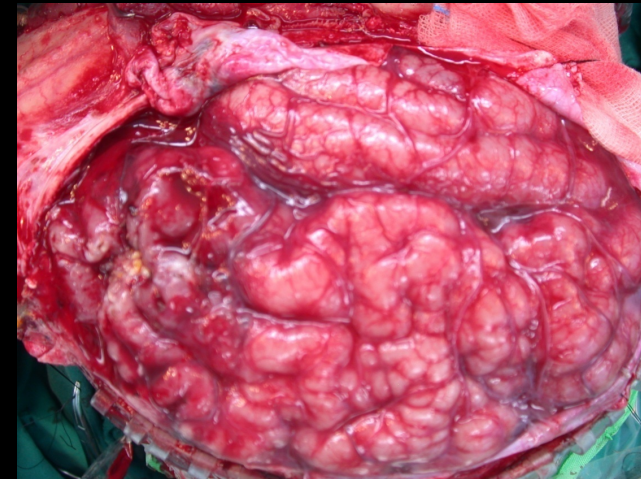
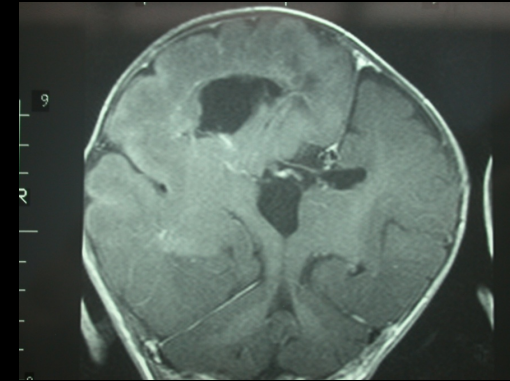
Extracranial surgery

- Frontal, parietal, occipital, multilobar
 - Lesionectomy
 - Lesionectomy & intraoperative EcoG
 - Lobectomy
 - Multilobar resection



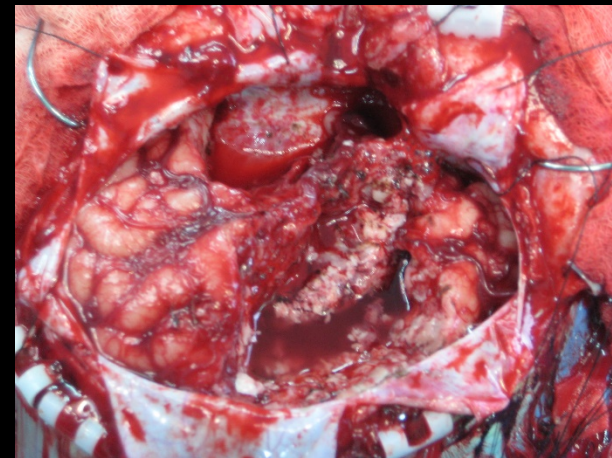
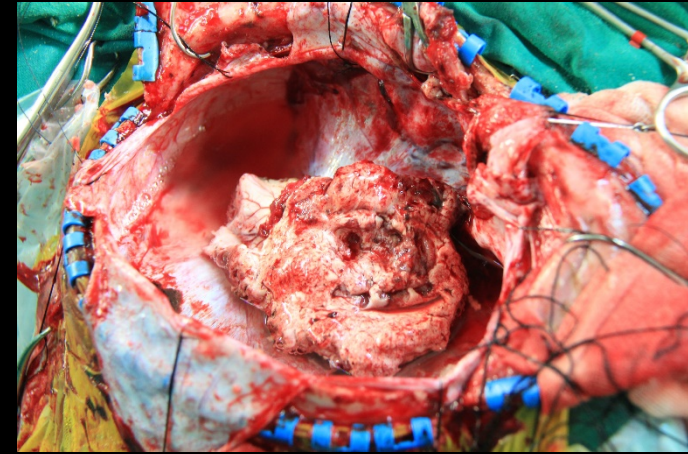
Hemispherectomy

- Hemimegalencephaly
- Rasmussen's encephalitis
- Perinatal infarction
- Sturge-Weber syndrome



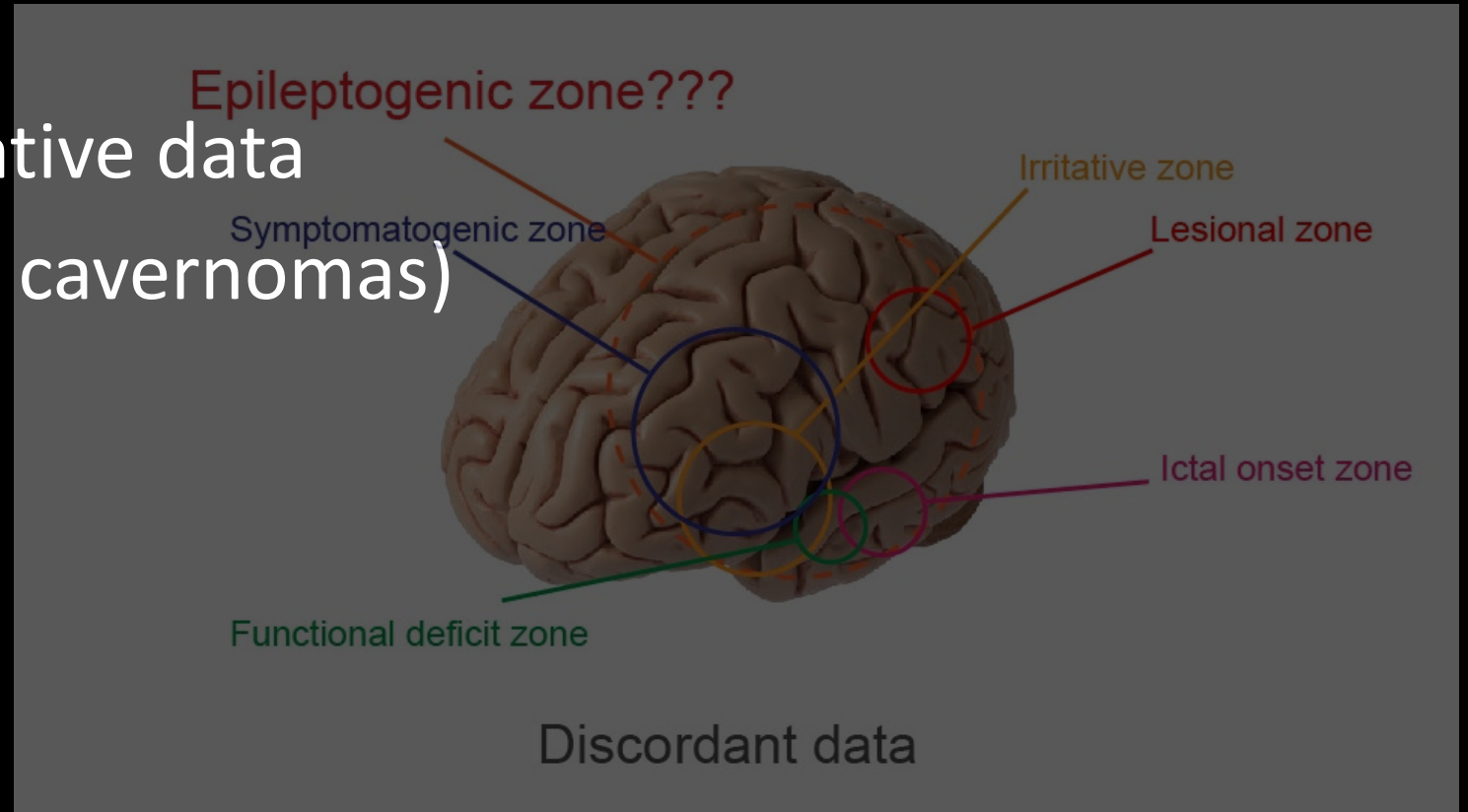
Hemispherectomy

- Anatomical
- Functional
 - Periinsular hemispherectomy
 - Transylvian hemispherotomy
 - Vertical hemispherotomy

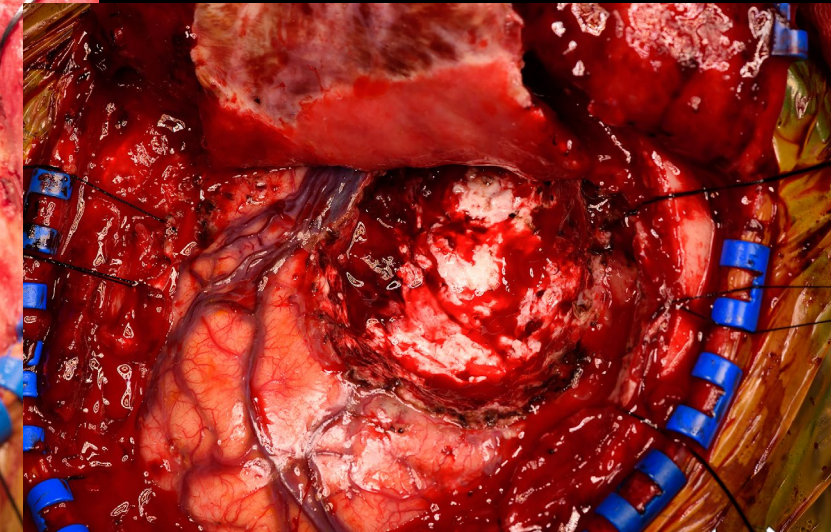
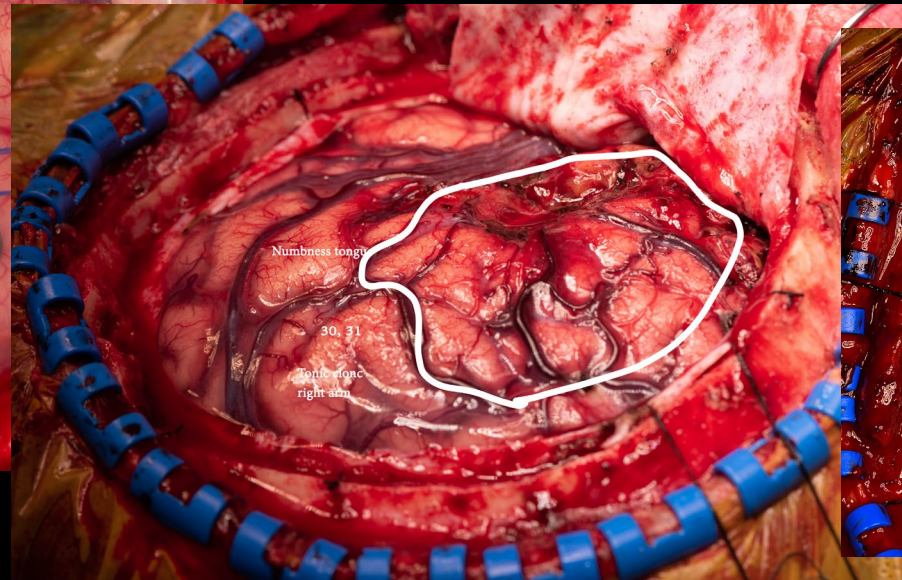
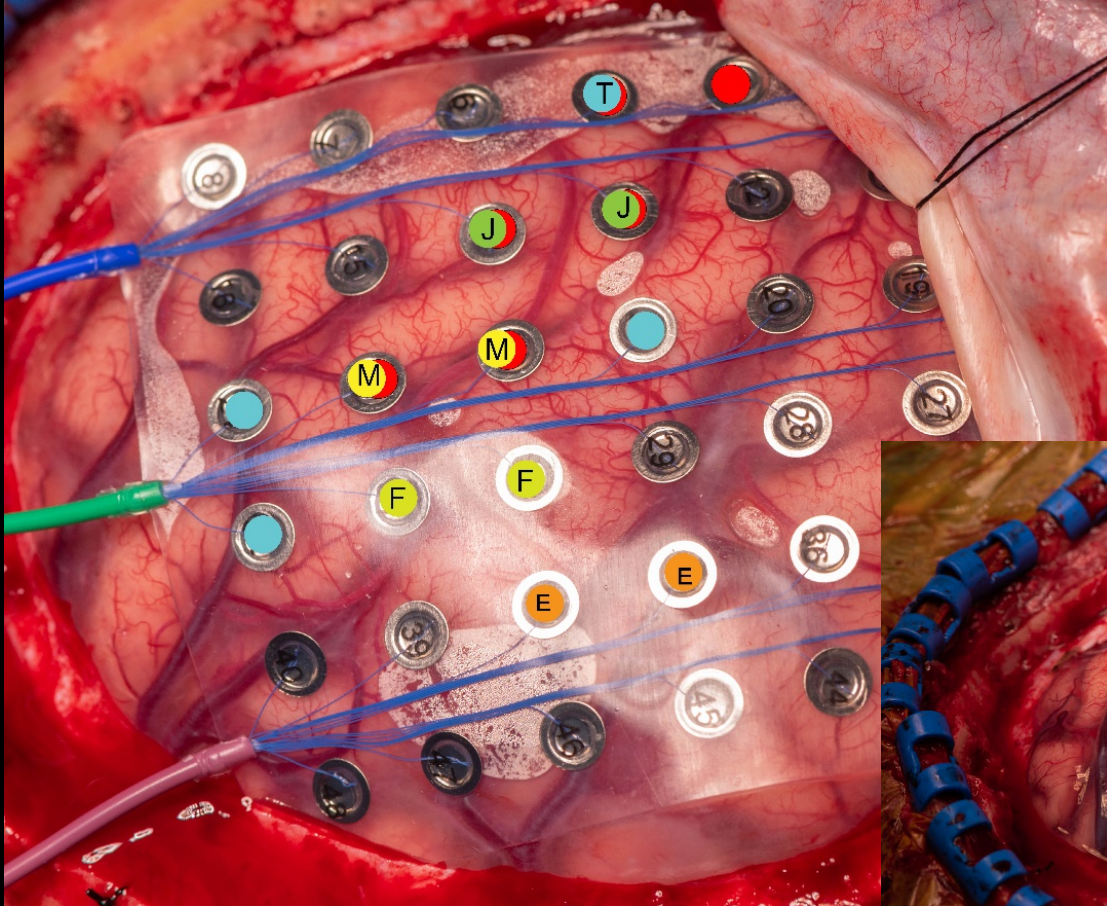
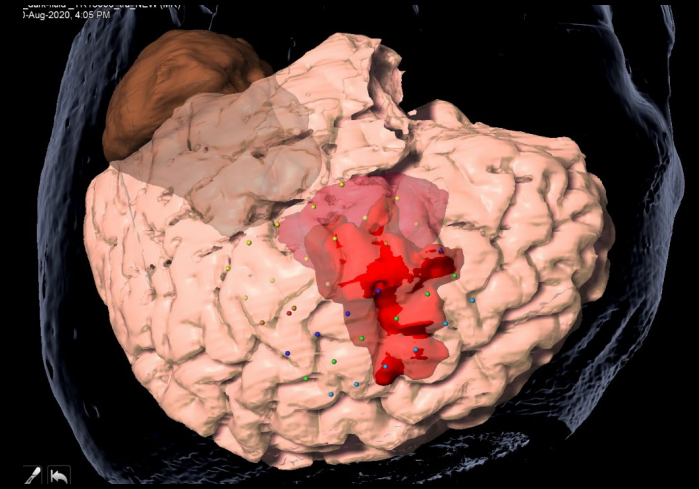


Intracranial EEG

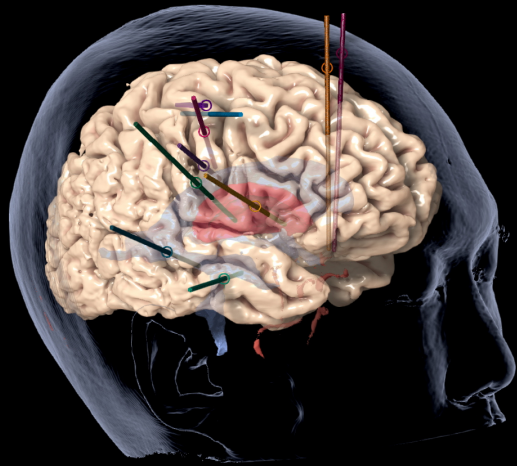
- Nonlesional
- Discordant preoperative data
- Multiple lesions (TS, cavernomas)
- Functional cortex



Subdural electrode

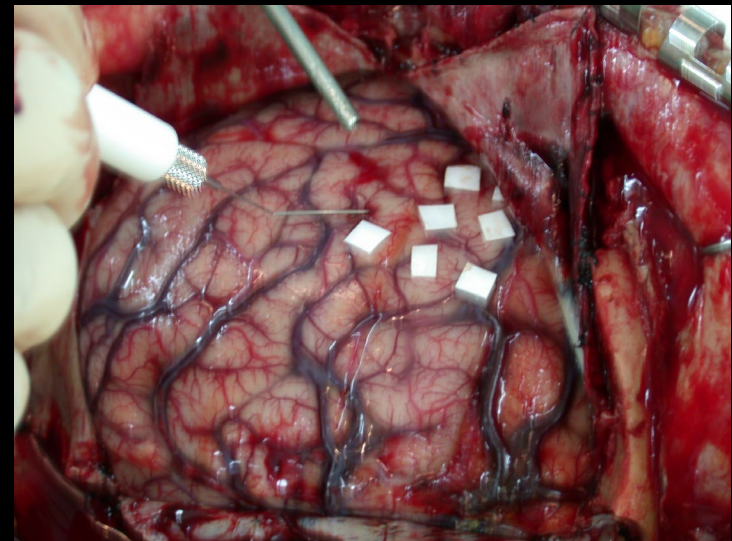
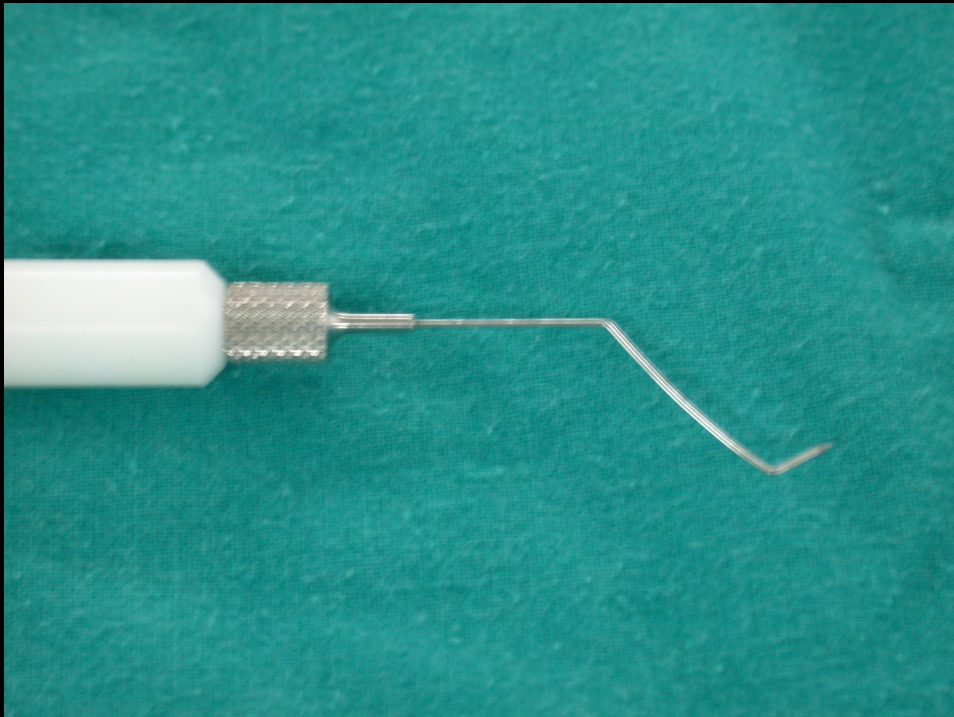


StereoEEG



Disconnection surgery

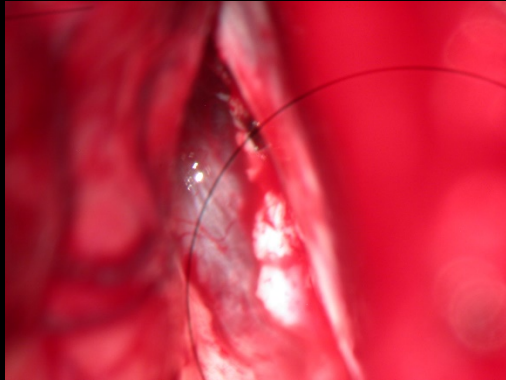
- Multiple subpial transection



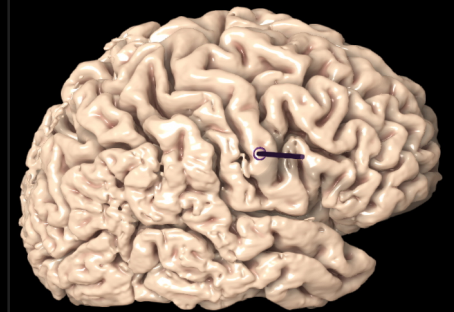
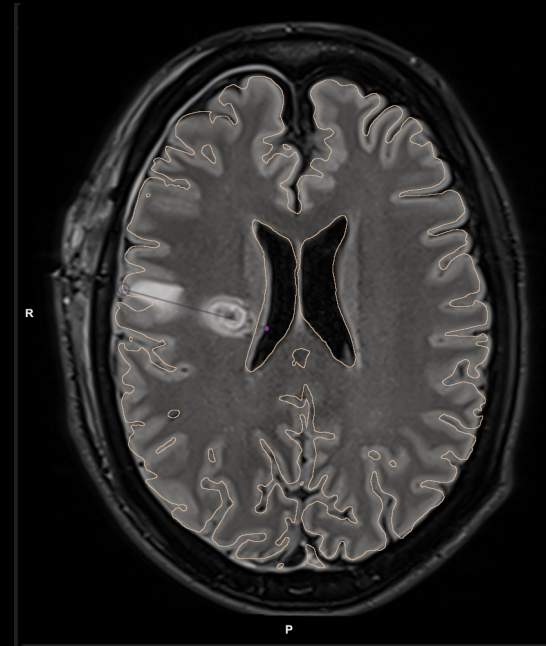
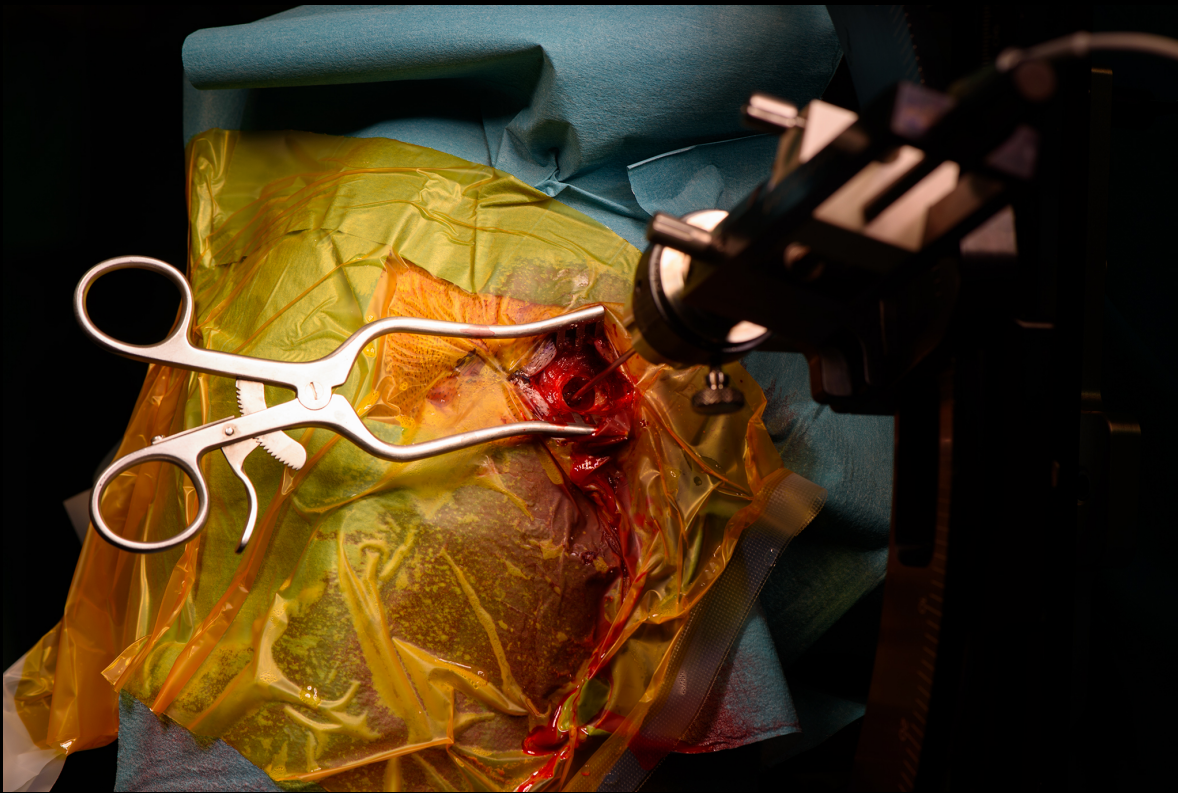
Disconnection surgery

- Corpus callosotomy

“Lennox-Gastaut syndrome”



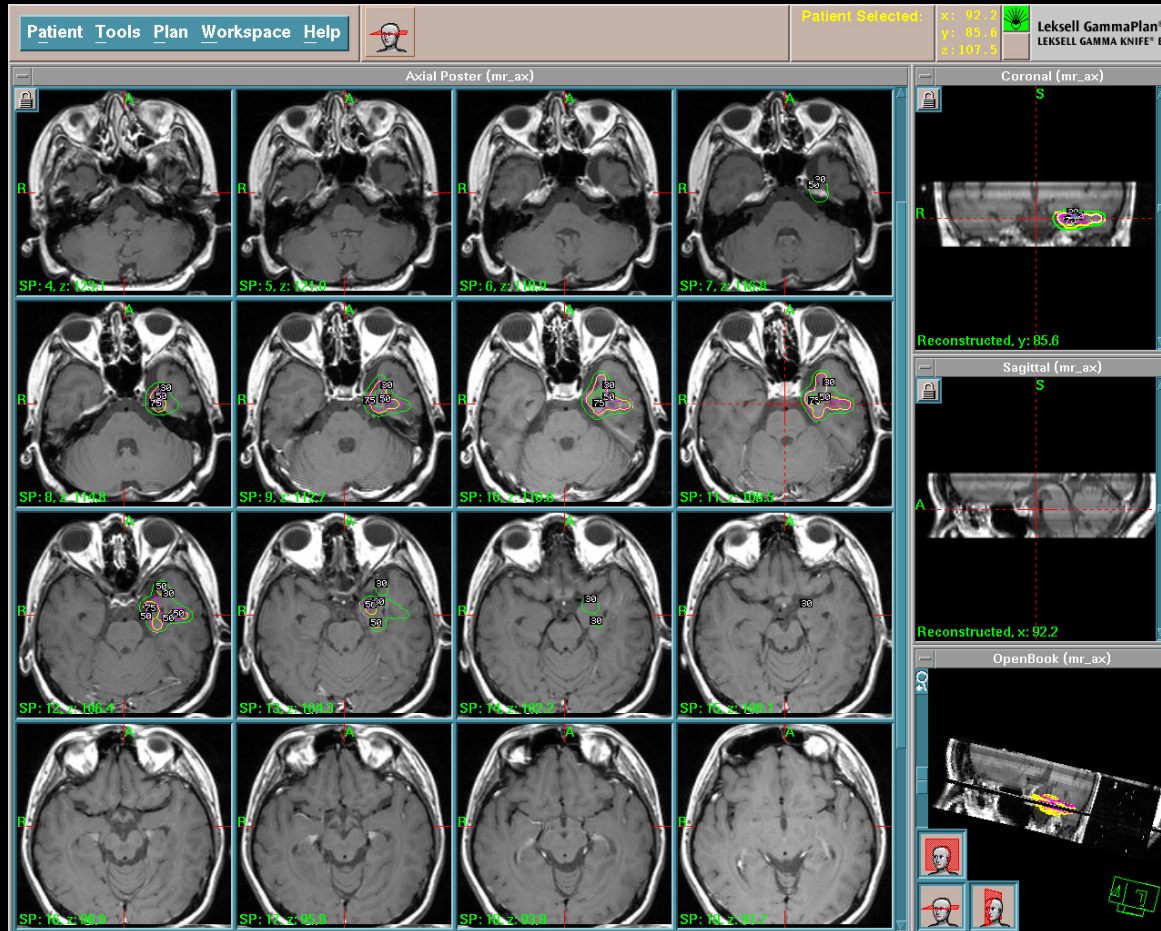
Ablation



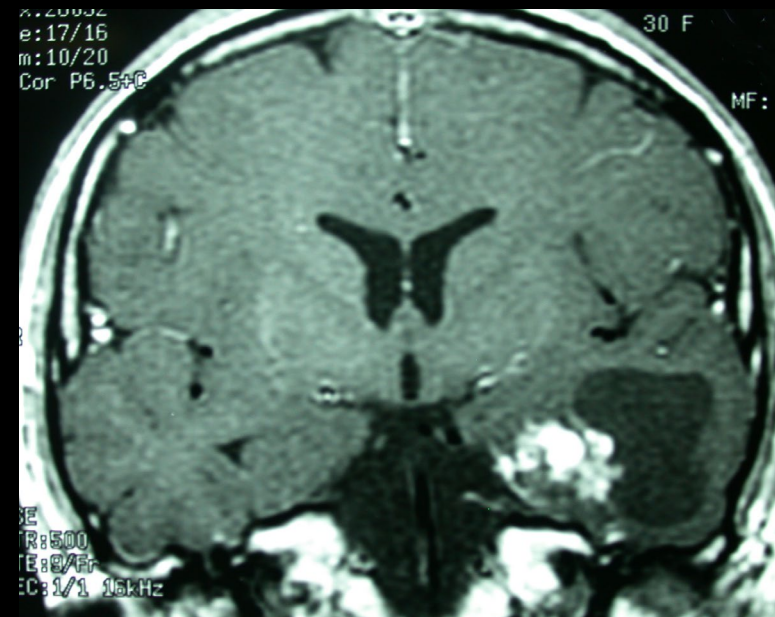
Frame-based stereotactic thermocoagulation



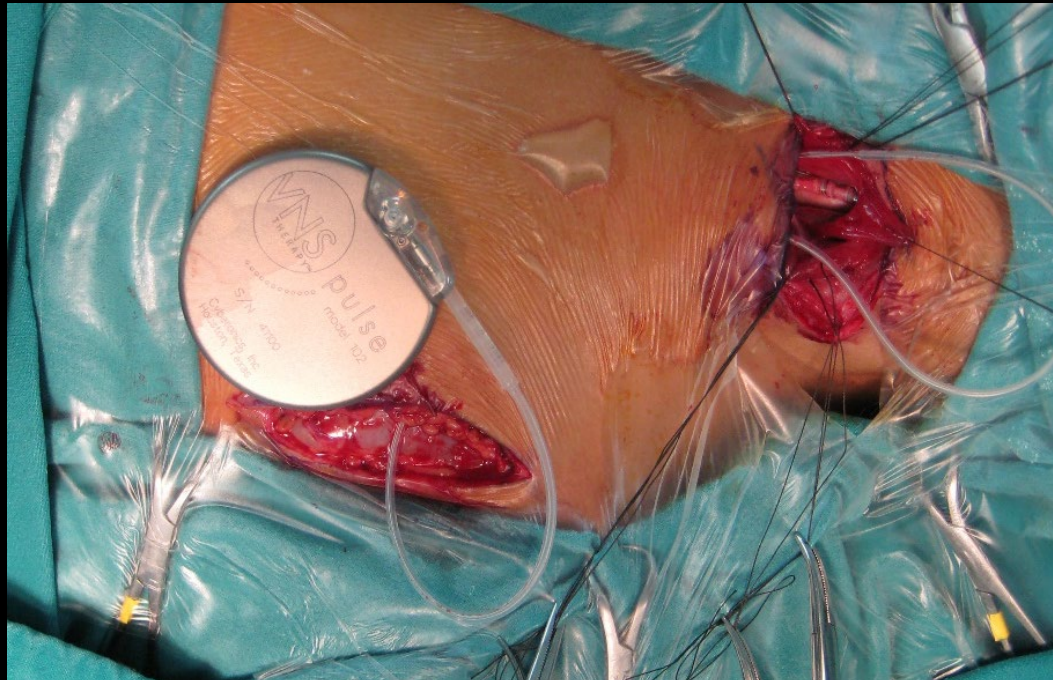
Radiosurgery



- MTLE
- Hypothalamic hamartoma
- Callosotomy

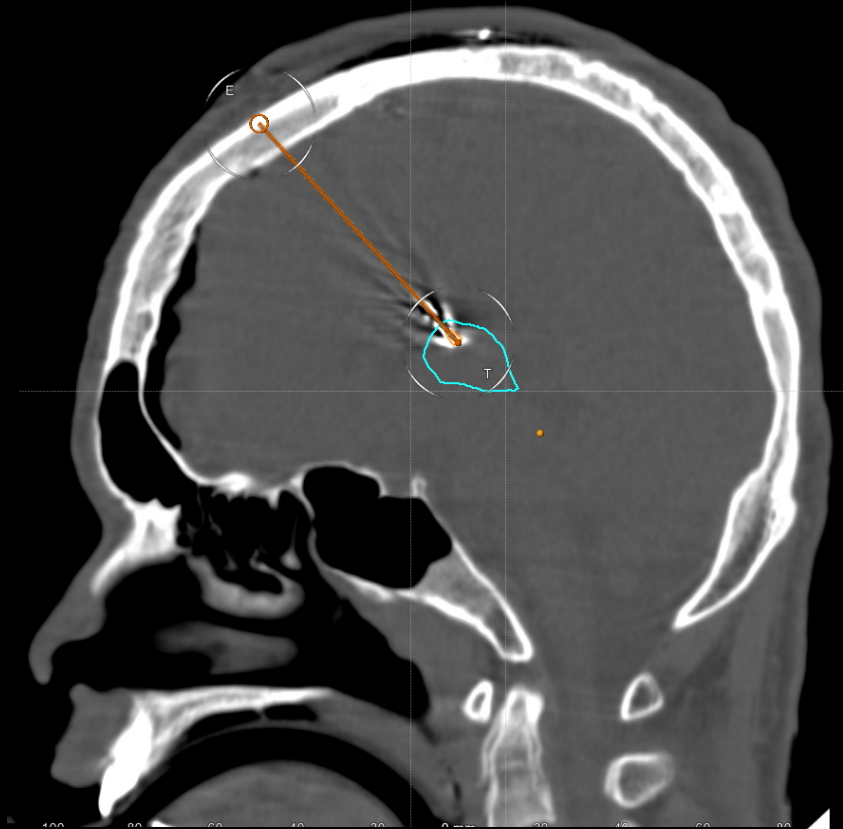
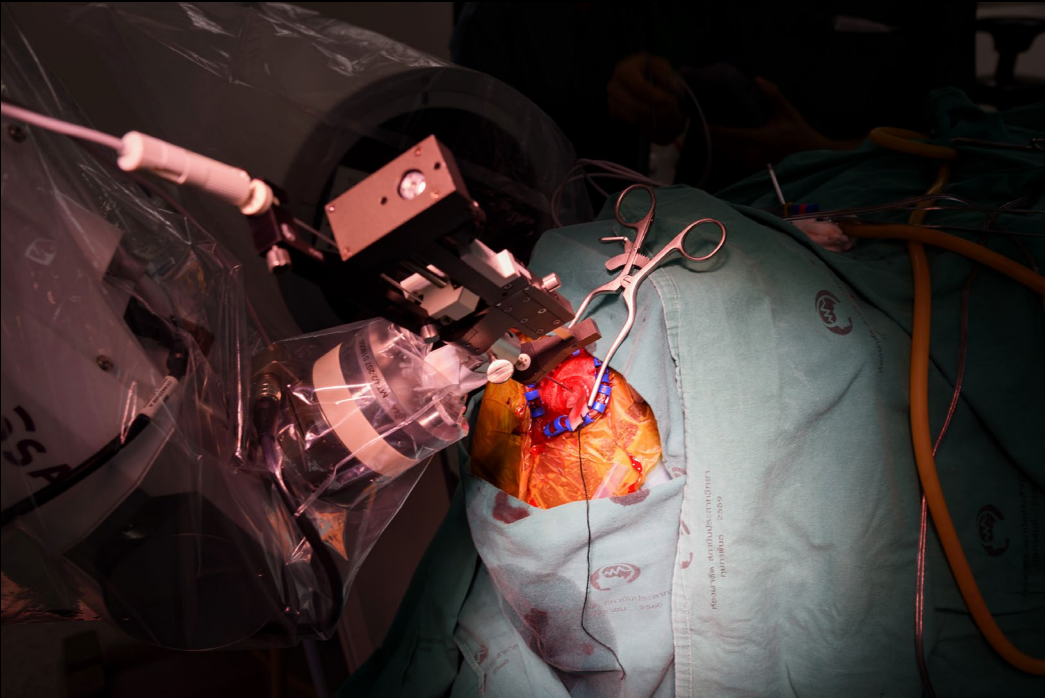


Vagal nerve stimulation



Deep brain stimulation

- Anterior thalamic nucleus (ATN)
- Centromedian nucleus



Thank you

