Mesial temporal lobe epilepsy treatment

In adults, mesial temporal lobe seizures are initially responsive to medical therapy but become more varied and refractory, and may respond to seizure surgery.

Radiofrequency thermocoagulation

Stereoelectroencephalography guided radiofrequency thermocoagulation.

Radiosurgery

see Mesial temporal lobe epilepsy radiosurgery.

Surgery

see Temporal lobe epilepsy surgery.

Surgical resection is the gold standard treatment for drug-resistant focal epilepsy, including mesial temporal lobe epilepsy (MTLE) and other focal cortical lesions with correlated electrophysiological features.

Surgical approaches for medically refractory mesial temporal lobe epilepsy (MTLE) that previously have been reported include anterior temporal lobectomy (ATL), transcortical selective amygdalohippocampectomy, transsylvian amygdalohippocampectomy, and subtemporal amygdalohippocampectomy.

Each approach has its advantages and potential pitfalls.

Anterior temporal lobectomy

see Anterior temporal lobectomy.

Subiculum stimulation

Evidence has been provided that the subiculum may play an important role in the generation of seizures.Electrostimulation at this target has been reported to have anticonvulsant effects in kindling and pilocarpine rat models, while in a clinical study of hippocampal deep brain stimulation (DBS), contacts closest to the subiculum were associated with a better anticonvulsive effect.

Vázquez-Barrón et al. evaluated the effect of Electrostimulation of the subiculum in patients with refractory mesial temporal lobe epilepsy (MTLE) who have hippocampal sclerosis (HS).

Six patients with refractory MTLE and HS, who had focal impaired-awareness seizures (FIAS) and focal to bilateral tonic-clonic seizures (FBTCS), had DBS electrodes implanted in the subiculum. During the first month after implantation, all patients were OFF stimulation, then they all completed an open-label follow-up of 24 months ON stimulation. DBS parameters were set at 3 V, 450 µs, 130 Hz, cycling stimulation 1 min ON, 4 min OFF.

There was a mean reduction of 49.16% (±SD 41.65) in total seizure number (FIAS + FBTCS) and a mean reduction of 67.93% (±SD 33.33) in FBTCS at 24 months. FBTCS decreased significantly with respect to baseline, starting from month 2 ON stimulation.

Subiculum stimulation is effective for FBTCS reduction in patients with MTLE and HS, suggesting that the subiculum mediates the generalization rather than the genesis of mesial temporal lobe seizures. Better results are observed at longer follow-up times [1].

1)
Vázquez-Barrón D, Cuéllar-Herrera M, Velasco F, Velasco AL. Electrostimulation of Subiculum for the Treatment of Refractory Mesial Temporal Lobe Epilepsy with Hippocampal Sclerosis: A 2-Year Follow-Up Study. Stereotact Funct Neurosurg. 2020 Oct 28:1-8. doi: 10.1159/000510295. Epub ahead of print. PMID: 33113540.