Evaluating long-term epilepsy outcomes with laser ablation surgery

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Dr. Brett Youngerman and researchers from the Columbia Comprehensive Epilepsy Center have led the largest multicenter series to date of magnetic resonance-guided laser interstitial thermal therapy (MRgLITT) recently published in the *Journal of Neurology, Neurosurgery, and Psychiatry*.

On the impacts of this study, Dr. Youngerman stated, "In the largest multi-center study to date, we found that MRI-guided laser ablation is a viable minimally invasive surgical treatment with lasting seizure control for drug resistant temporal lobe epilepsy. Congratulations and thanks to all of the authors for their important contributions."

What is interstitial thermal therapy?

For people with clearly localized seizure sites (foci) that may be difficult or risky to access with traditional surgery, Columbia Neurosurgery offer a minimally invasive techniques called laser interstitial thermal therapy (LITT- also known as laser ablation). Using computer-guided navigation, both of these techniques attempts to eliminate the seizure focus without making a large opening in the skull.

Aided by MRI, our surgeons guide a laser through a three-millimeter incision and into the focus of a seizure to destroy the brain tissue causing seizures. Most people are able to go home the next day.

Details of the study

MRgLITT is a minimally invasive alternative to surgical resection for drug-resistant mesial temporal lobe epilepsy (mTLE). The durability of seizure freedom after MRgLITT and outcomes after subsequent resection were previously largely unknown. The study found that among 268 consecutively treated patients at 11 centers, nearly half (49.3%) of

patients had durable seizure freedom at last follow-up (median 47, range 12–95 months) and an additional 16.7% had rare disabling seizures.

Preoperative focal to bilateral tonic-clonic seizures were independently associated with seizure recurrence. Among patients with seizure recurrence after MRgLITT, 14/21 (66.7%) became seizure-free after subsequent anterior temporal lobectomy (ATL) and 5/10 (50%) after repeat MRgLITT. The authors concluded that MRgLITT is a viable minimally invasive, first-line surgical treatment with durable outcomes for patients with drug-resistant mTLE evaluated at a comprehensive epilepsy center.

Although seizure freedom rates were lower than reported with ATL, this series represents the early experience of each center and a heterogeneous cohort. ATL remains a safe and effective treatment for well-selected patients who fail MRgLITT.

More information: Brett E Youngerman et al, Long-term outcomes of mesial temporal laser interstitial thermal therapy for drug-resistant epilepsy and subsequent surgery for seizure recurrence: a multi-centre cohort study, *Journal of Neurology, Neurosurgery & Psychiatry* (2023). DOI: 10.1136/jnnp-2022-330979

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