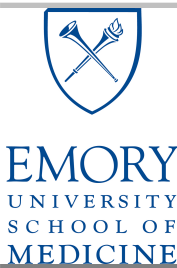


MRI-guided Stereotactic Laser Ablation of Presumed Cavernous Malformations in Drug-resistant Epilepsy

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Introduction

Open surgical resection is generally indicated for symptomatic cavernous malformations, including those associated with medically refractory epilepsy. Minimally invasive alternatives may maintain therapeutic efficacy while minimizing complications and disfigurement. MRI-guided stereotactic laser ablation (SLA) is a novel, FDA-cleared, minimally invasive approach to treating lesional epilepsy and brain tumors, including deep-seated lesions. To date, this approach has not been reported for cavernous malformations (CM). We present a case series of SLA of presumed CM causing refractory epilepsy.

Methods

Five patients with medically refractory epilepsy undergoing standard presurgical evaluation (3-Tesla MRI, fluoro-deoxyglucose PET, neuropsychological evaluation, and inpatient video-EEG studies) were found to have corresponding lesions consistent with CM. Each underwent stereotactic placement of a laser fiber assembly (optical fiber in a saline-cooled 1.6-mm diameter catheter, Visualase, Inc.) via twist drill hole under general anesthesia. Real-time MR anatomic and thermal imaging verified placement and extent of ablation of CM and

Learning Objectives

- By the end of the presentation, participants should be able to:
- 1) Describe the natural history and classical treatment of cavernoma related drug-resistant epilepsy
 - 2) Describe the technique for minimally invasive stereotactic laser ablation of cavernous malformations
 - 3) Understand the potential benefits, risks, and complications associated with the new procedure

Results

MR imaging revealed no evidence of hemorrhage following fiber placement within presumed CM. Immediate post-procedure contrasted imaging confirmed ablation in all cases. We detected no adverse events or neurological deficits. No ICU admissions were indicated and patients were discharged the following day. Three patients with temporal lobe lesions are seizure free at 6-15 months follow-up. One patient with a frontal lobe lesion has had a significant reduction in seizure frequency and severity, but is not seizure-free. It is too soon for seizure follow-up on the most recent patient.

Conclusions

Minimally invasive MRI-guided SLA of presumed epileptogenic CM is a potentially safe and effective alternative to open resection. We have performed this procedure without complication in five patients who have experienced excellent seizure outcomes. With additional experience this technique may become an excellent first option for patients with this disorder.