Stereotactic laser amygdalohippocampotomy

Selective laser amygdalohippocampotomy (SLAH) is a minimally invasive surgical treatment for medial temporal lobe epilepsy. Visual field deficits (VFDs) are a significant potential complication. The objective of this study was to determine the relationship between VFDs and potential mechanisms of injury to the optic radiations and lateral geniculate nucleus. We performed a retrospective cross-sectional analysis of 3 patients (5.2%) who developed persistent VFDs after SLAH within our larger series (n = 58), 15 healthy individuals and 10 SLAH patients without visual complications. Diffusion tractography was used to evaluate laser catheter penetration of the optic radiations. Using a complementary approach, we evaluated evidence for focal microstructural tissue damage within the optic radiations and lateral geniculate nucleus. Overablation and potential heat radiation were assessed by quantifying ablation and choroidal fissure CSF volumes as well as energy deposited during SLAH.SLAH treatment parameters did not distinguish VFD patients. Atypically high overlap between the laser catheter and optic radiations was found in 1/3 VFD patients and was accompanied by focal reductions in fractional anisotropy where the catheter entered the lateral occipital white matter. Surprisingly, lateral geniculate tissue diffusivity was abnormal following, but also preceding, SLAH in patients who subsequently developed a VFD (all p = 0.005).In our series, vision-related complications following SLAH, which appear to occur less frequently than following open temporal lobe -surgery, were not directly explained by SLAH treatment parameters. Instead, our data suggest that variations in lateral geniculate structure may influence susceptibility to indirect heat injury from transoccipital SLAH [1)].

Stereotactic laser amygdalohippocampotomy (SLAH) uses Magnetic resonance guided laser induced thermal therapy.

This novel intervention can achieve seizure freedom while minimizing collateral damage compared to traditional open surgery, in patients with mesial temporal lobe epilepsy. An algorithm is presented to guide treatment decisions for initial and repeat procedures in patients with and without mesial temporal sclerosis. SLAH may improve access by medication-refractory patients to effective surgical treatments and thereby decrease medical complications, increase productivity, and minimize socioeconomic consequences in patients with chronic epilepsy [2)].

The report of Willie, Jon T et al., demonstrates the technical feasibility and encouraging early results of stereotactic laser amygdalohippocampotomy (SLAH), a novel approach to eliminating seizures while minimizing collateral injury in patients with mesial temporal lobe epilepsy (MTLE). Efficacy appears to approach that of open resection, especially in patients with mesial temporal sclerosis (MTS). Such minimally invasive techniques may be more desirable to patients and result in increased use of epilepsy surgery among the large number of medically intractable epilepsy patients. A larger, longer term multicenter study of seizure and cognitive outcomes after SLAH is currently under way [3)].

1)
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2)
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3)

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