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## INSIDE PEDIATRICS

### Laser Surgery Proves Effective For Some Epilepsy Patients

On Valentine's Day 2017, 19-year-old Robin Struble became the first patient to undergo thermal laser ablation surgery to treat her epilepsy at Children's of Alabama. Thermal laser ablation, trademarked as Visualase, is touted as less invasive than a craniotomy and boasts a quicker recovery time.

Visualase uses a flexible laser fiber that is guided through a "nick" scalp incision and small hole in the skull – 3.2 millimeters to be exact or about the width of a coffee stir stick. The laser heats and destroys abnormal brain tissue, leaving the surrounding healthy tissue unharmed. The entire procedure is viewed in real time on magnetic resonance imaging to ensure safe and successful target treatment. Thermal maps show the extent of the tissue being destroyed. Finally, the laser is removed and the incision is closed with minimal sutures, typically one stitch.



Children's of Alabama neurosurgeon Curtis Rozzelle, M.D., and members of the Children's neurosurgery and imaging teams view a Visualase surgery using the ClearPoint imaging system in the MRI suite.

Eligible candidates include patients whose epilepsy doesn't respond well, or at all, to medicine or those who have MRI-visible lesions that have been confirmed as the source of the epilepsy. A key part of determining Struble's suitability was an intracranial EEG investigation using an array of depth electrodes that were implanted using the ROSA Surgical Robot, which acts as a sort of GPS for the skull and may be used for all types of cranial intervention. Only when the depth electrodes confirmed Struble's seizures originated from her MRI-visible lesion did Visualase become a treatment option. The target does not have to be visible on MRI to use laser ablation, although targeting is easier in those cases.

Children's neurosurgeons Jeffrey Blount, M.D., and Curtis Rozzelle, M.D., underwent training to perform Visualase therapy, first approved by the U.S. Food and Drug Administration in 2010. In addition, the Children's neurosurgery team and imaging department worked closely to implement the new system. While long-term outcomes are not fully known, preliminary results show a large portion of patients experience immediate improvement or control, and these results have lasted several months to one year. Additional studies are ongoing to measure long-term outcomes.

"[Visualase] puts us on the cutting edge in offering the latest treatment options and modalities in neurosurgery," Rozzelle said. "It gives us another tool for epilepsy patients and perhaps going forward for tumor patients as well."

Rozzelle explained the neurosurgery team delivers the therapy one of two ways – via the ROSA Surgical Robot or the ClearPoint system. ClearPoint provides stereotactic guidance for accurate placement and operation of instruments in a hospital's existing MRI suite. When ROSA is used, however, the laser fiber is inserted in the operating room, then the patient is transferred to imaging. While treatment time is a matter of minutes, setup and laser placement can take on average three to four hours. Once again, careful and accurate placement is key.

Struble was discharged the day after the surgery and has not experienced a seizure since.

"It makes me feel good," Robin said of living seizure free. "I can work now!"