



ROSA[®]
by medtech
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Minimally Invasive Epilepsy Surgery for Pediatric Patients

Pediatric patients with epilepsy present a unique challenge for clinicians. For young patients whose seizures are not well controlled by medication or diet, identifying seizure foci and utilizing surgical interventions to control or eliminate seizure activity is often considered as a next step, since the impact of ongoing seizures on cognitive development can be significant over time.

Utilizing ROSA[®] for minimally invasive SEEG allows the epilepsy team to understand and identify potential seizure foci without requiring more maximally invasive neurosurgical approaches to seizure localization. ROSA[®] allows the team to plan the placement of depth electrodes to further monitor seizures and place the electrodes through small drill holes in the skull along the pre-planned trajectories. Often, this approach allows the surgeon to perform the procedure without the need to shave the patient's head.

Evaluating Pediatric Patients for SEEG with ROSA[®]

The first step once a child is diagnosed with seizures is often treatment with anti-seizure medication. If seizures prove difficult to control with medications, the neurologist determines that a patient's epilepsy is resistant* to management with anti-seizure medications.



Following this diagnosis, the patient may then be referred to a comprehensive epilepsy center (most often a Level IV center following AANS guidelines) for evaluation of additional treatment options. The referral decision is impacted by many factors, including the neurologist's risk vs benefit assessment, the proximity of a level IV center, and the patient and caregiver's tolerance for further evaluation.

Once seen at the comprehensive epilepsy center, the patient undergoes further testing and evaluation, which may include:

- ~ Further resolution MRI imaging (may be a higher resolution than the original MRI, if MRI was previously utilized)
- ~ Functional MRI (fMRI)
- ~ Long-term monitoring in the Epilepsy Monitoring Unit (EMU) using scalp electrodes
- ~ WADA testing
- ~ Neuropsych evaluation

Once the relevant testing information has been collected, a multi-disciplinary patient management review is conducted, which includes the neurologist/epileptologist and neurosurgeon, to determine potential treatment options for the patient. If further monitoring using depth electrodes is determined to be the next step, minimally invasive SEEG is performed with ROSA[®], to implant depth electrodes for further evaluation of the patient's seizures, and localization of seizure foci. Utilizing ROSA for SEEG allows the surgeon and neurologist to pre-plan where they would like to implant electrodes, and allows the surgeon to use robotic guidance for accurate, efficient placement of electrodes in the OR.

Based on the findings, a plan of action is developed, and may include the following treatment options for the patient:

- ~ Minimally invasive ablation of the seizure focal areas
- ~ Resection of the areas of the brain where seizures originate, if appropriate
- ~ Placement of leads in or near the points of seizure origination to disrupt seizure activity
- ~ Additional SEEG monitoring

*Utilizing guidelines from the International League Against Epilepsy, this is the failure of sustained seizure control following adequate trial of two appropriate antiepileptic medications.

