



IN BRIEF

Considerations for Surgical Treatment Drug-resistant Epilepsy in Young Children

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Epilepsy, Neurology, Neurosurgery



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Surgical management can achieve seizure freedom in pediatric patients with drug-resistant epilepsy, but special precautions must be taken.

Seizure freedom rates after surgical treatment of drug-resistant epilepsy (DRE) can be as high as 90 percent in young children, according to a new study by a multidisciplinary epilepsy surgery team from Nationwide Children’s Hospital.

“Over the last several decades, numerous anti-seizure medications have come out. They have different mechanisms of action, but unfortunately, they all have incredibly similar efficacy,” says Adam Ostendorf, MD, senior author of the study. “Epilepsy is a common disease, but for about one-third of patients with epilepsy, medication alone will not work for them.”

Opinion Poll

Which emerging technology will have the greatest impact on health care?

ROBOTICS AND ARTIFICIAL INTELLIGENCE

3D PRINTING

BLOCKCHAIN

GENOMICS

Results

GENOMICS:
45%, 21 Votes

BLOCKCHAIN:

13%, 6 Votes

3D PRINTING:

19%, 9 Votes

ROBOTICS AND ARTIFICIAL INTELLIGENCE:

23%, 11 Votes



The investigators sought “to provide a thorough and systematic review of the literature that discusses and explores intracranial epilepsy surgery” in infants and toddlers in addition to the clinical insights gained by the Nationwide Children’s team, explains [Jonathan Pindrik, MD](#), lead author of the study and surgical director of the [Epilepsy Surgery Program](#) at Nationwide Children’s.

The review, which was published in the journal *Neurosurgical Focus*, included 20 studies that were published between January 1990 and May 2017. The mean patient age at surgery was 16.8 months (1.4 years); ages ranged from 28 days to 36 months. Resective or disconnective surgery was performed in 444 patients (18 studies). Two studies included 21 patients that underwent vagus nerve stimulator insertion.

The authors found that in contrast to older children and adults, the predominant etiologies of DRE in infants and toddlers were hemispheric syndromes, malformations of cortical development, vascular malformations, stroke, tuberous sclerosis complex, neoplasms and prior infections.

Approximately 90 percent of the surgeries were extratemporal resections, multilobar resections, or hemispherectomies/hemispherotomies, and 42 percent of the surgeries were anatomical hemispherectomies and functional hemispherotomies.

Seizure freedom rates ranged from 45-90 percent after surgical treatment for DRE. In patients who underwent hemispherotomy and hemispherectomy, the rates ranged between 65 percent and 85 percent. Vagus nerve stimulator insertion led to 33-66 percent reductions in seizures and had 0-13 percent surgical complication rates, usually attributed to device infection.

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“We were disappointed by the lack of evidence [regarding safety and efficacy] for the newer [less-invasive] techniques in young children and hope to improve this over time,” says Dr. Ostendorf, who is also an assistant professor at The Ohio State University.

No randomized, controlled trials or prospective cohort studies met the review inclusion criteria; thus, all studies were retrospective reviews, observational studies, or uncontrolled cases series.

Drs. Ostendorf and Pindrik emphasize the multidisciplinary nature of managing patients with epilepsy, especially young children. “Being seen and treated at a center that specializes in intractable epilepsy is important because it often requires many unique and specialized tests and a large team of people to identify the right kind of surgery for the patient,” says Dr. Ostendorf.

The review covers the intricacies of handling and positioning pediatric patients during surgery and warns of their susceptibility to hypothermia and blood loss, which is the leading cause of mortality in infants undergoing epilepsy surgery.

“Despite the higher intraoperative and postoperative risks of morbidity and mortality, we would highly encourage other [epilepsy surgery] teams to closely evaluate and consider these patients for surgery at a young age because the risks of ongoing seizures can be devastating due to neurocognitive impairments, and the potential benefits from early successful intervention can be remarkable,” says Dr. Pindrik, who is also an assistant professor at The Ohio State University, “getting them on a better track towards seizure freedom or at least seizure reduction and neurocognitive improvement.”

Reference:

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[Center for Childhood Cancer and Blood Diseases](#)

[Center for Clinical and Translational Research](#)

[Center for Colorectal and Pelvic Reconstruction](#)

[Center for Gene Therapy](#)

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