Epilepsy surgery in infants under a year of age

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Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the efficacy of epilepsy surgery in children under one year of age, 2) Identify the risks and complications associated with surgery in this age group.

Introduction

Infants with epilepsy often have a catastrophic course. There is a historical reluctance to operate in the very young, though experience is accumulating that persistent early seizures are detrimental.

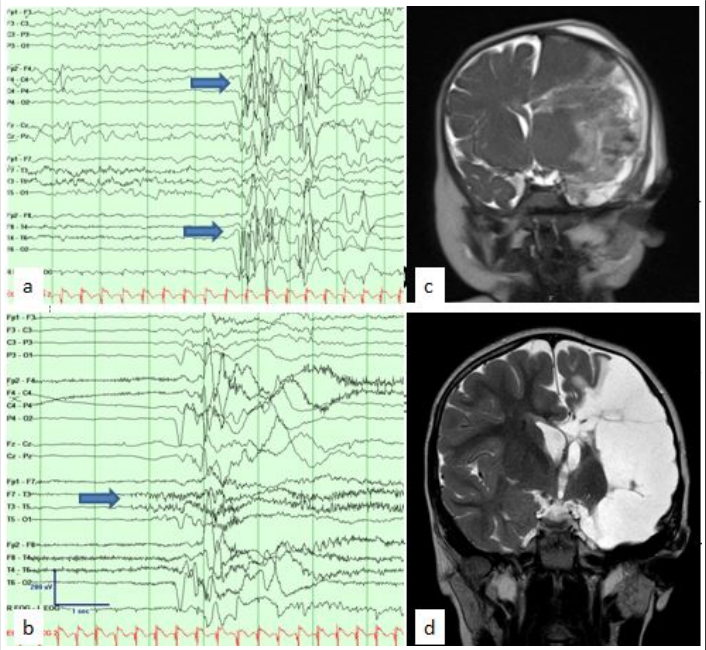
Methods

Epilepsy operations performed on children under one year of age between 2002 and 2013 were reviewed for demographic information, seizure outcome, and surgical complications.

Results

Patient Demographics and Surgical Interventions: 25 patients were 18 days to 11 months at operation, with a mean age 141 days, and a median age of 99 days. 17(68%) of these had seizures by the first two weeks of life. All had daily seizures and 80% had more than 10 seizures per day. Twenty-two had an abnormal MRI.
15(60%) patients underwent hemispherotomy at initial operation, and one an anatomical hemispherectomy. Seven(32%) infants had grid placement followed by focal resection. One of these required a subsequent hemispherotomy. One patient underwent a frontal lobe resection with electrocorticography but required a subsequent grid placement with repeat resection. One had resection of a temporal DIGG.
Seizure Outcomes: Mean follow-up was 62.4 months. 20 patients(80%) are seizure free, 10(40%) on no anticonvulsant. Two patients are Engle class 2, and the remaining 3 patients were Engel class 4, one of whom died with status epilepticus from the contralateral hemisphere.

Case Illustration



An infant who began having epileptic spasms and focal seizures on the first day of life. a) Pre-operative inter-ictal EEG showed diffuse abnormalities with bursts of high amplitude spike and wave discharges (arrows) more prominent over the right hemisphere. b) Pre-operative EEG during an epileptic spasm showed clear lead-in from the left temporal area (arrow) but higher amplitude over the right hemisphere. The patient underwent hemispherotomy and is seizure-free.

Pathology: Focal cortical dysplasia was the most common pathology (10 patients,45%) followed by hemimegalencephaly (7 patients,32%). One patient each had hemispheric infarct, Tuberous sclerosis, Sturge-Weber, atypical Rhett syndrome, and cobolamine C deficiency.
Surgical Complications: A total of 9 complications (36%) occurred in this patient series. All patients required blood transfusions. Estimated blood loss ranged from 10 to 194 cc/kg with an average of 66cc/kg. Two hemispherectomies were aborted because of bleeding, and completed at a subsequent operation.
Five patients (20%) developed hydrocephalus, 4 after hemispherotomy and one after a wide resection of a cortical tuber. Infection occurred in one patient after subdural grid implantation. One death ocurred in an infant with epidermal nevus syndrome who underwent hemispherotomy. Post-operatively he developed refractory seizure activity arising from the contralateral hemisphere and care was withdrawn several months after operation.

Conclusions

This large single-institution experience supports that infants with localization-related catastrophic epilepsy can have safe operations and excellent outcomes. There is no reason to delay intervention until they are older and have a longer-standing seizure burden.

Key References

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