

Rates and Predictors of Success in Repeat Epilepsy Surgery: A Meta-Analysis and Systematic Review Max Ostrinsky Krucoff MD; Alvin Y Chan BS; Stephen C Harward MD; John David Rolston MD, PhD; Dario J. Englot MD,

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Introduction

Medically refractory epilepsy is a debilitating disorder that is particularly challenging to treat in patients who have already failed a surgical resection. Evidence regarding outcomes of further epilepsy surgery is limited to small case series and reviews. Therefore, our group performed the first quantitative meta-analysis of the literature from the past 30 years to assess for rates and predictors of successful reoperations.



Methods

A PubMed search was conducted for studies reporting outcomes of repeat epilepsy surgery. Studies were excluded if they reported fewer than 5 eligible patients or had average follow ups < 1 year, and patients were excluded from analysis if they received a non-resective intervention. Outcomes were stratified by each variable of interest and quantitative meta-analysis was performed to generate odds ratios (OR) and 95% confidence intervals (CI).

Results

782 patients who received repeat resective epilepsy surgery from 36 studies were included. Engel I outcome was observed in 47% (N=369) of patients. Significant predictors of seizure freedom in included congruent over non-congruent electrophysiology data (OR 3.6, 95% CI 1.6-8.2), lesional over nonlesional epilepsy (OR 3.2, 95% CI 1.9-5.3), and surgical limitations over disease-related factors associated with failure of the first surgery (OR 2.6, 95% CI 1.3-5.3). Among patients with at least one of these predictors, seizure freedom was achieved in 58%. Conversely, the use of invasive monitoring was associated with worse outcome (OR 0.4, 95%) CI 0.2-0.9). Temporal lobe over extratemporal/multilobe resection (OR 1.5, 95% CI 0.8-3.0) and abnormal over normal pre-operative MRI (OR 1.9, 95% CI 0.6-5.4) showed nonsignificant trends toward seizure freedom.



Conclusions

Here we provide the first quantitative meta-analysis of predictors of success in repeat epilepsy surgery. Predictors of favorable outcome in repeat surgery resemble those reported with initial epilepsy surgery. Overall, this analysis supports considering further resection in patients with intractable epilepsy who continue to have debilitating seizures after an initial surgery, especially in the context of factors predictive of a favorable outcome.