LOCATION AND ETIOLOGY INFLUENCING SURGICAL OUTCOME

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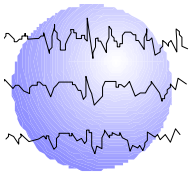

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ABSTRACT

Rationale: Many factors are considered in selecting epilepsy surgical candidates. Etiology and region of resection are often thought to be influential variables in predicting a successful outcome.

Methods: We analyzed all pediatric patients who underwent initial resective surgery at Minnesota Epilepsy Group, PA from Jan 2000-Dec 2002. Diagnostic variables including etiology and region of resection were reviewed. Etiology was described as symptomatic or idiopathic. Etiology was also specifically categorized into congenital, genetic, infectious, neoplastic, traumatic, vascular, extra-temporal encephalomalacia, mesial temporal sclerosis, undetermined, as well as an "other recognized pathology" group. Regions of resection were organized into temporal versus extra-temporal. Extra-temporal was grouped into frontal, parietal, and multilobar resection. Subjects were scored at follow-up at 12- and 24-months by Engel classification. Outcomes of Engel I and II classes were considered beneficial. Statistical method utilized Fisher's Exact Test.

Results: Forty-six consecutive subjects were identified and reviewed; 23 (50%) underwent temporal lobe-only resection; extra-temporal resections included 10 (22%) frontal, 1 (2%) parietal, and 12 (26%) multi-lobe. 41/46 (90%) of subjects had follow-up data: 23/41 (56%) were seizure free at 12-months, and 19/33 (58%) were seizure free at 24-months. Of those patients with follow-up data at 12-months, 13/21 (62%) subjects with temporal lobe-only resection were seizure free compared to 10/21 (48%) with extra-temporal surgery. This was not a statistically significant difference ($p<0.268$). However, temporal lobe surgery was statistically more successful achieving a beneficial outcome of Engel I-II in 17/21 (81%) subjects compared to 11/21 (52%) of the extra-temporal group ($p=0.05$). This trend continued to be significant at 24-months ($p<0.046$). Subjects with symptomatic etiology achieved similar seizure freedom at 12-months in 21/35 (60%) compared to 2/7 (29%) subjects with probably symptomatic etiology ($p<0.134$). Etiology did influence beneficial outcome (symptomatic 26/35: 74%; probably symptomatic 2/7: 29%) at 12-months ($p<0.031$) but not at 24-months (symptomatic 23/30: 77%; probably symptomatic 1/3: 33%) ($p<0.174$). This is may be influenced by low numbers within the probably symptomatic group.

Conclusion: Pediatric patients with temporal lobe resections are more likely to achieve a beneficial outcome compared to extra-temporal resections, despite having similar seizure free rates. The major difference between these groups is Engel class II. Patients with symptomatic etiology achieved beneficial outcomes more often than those with probably symptomatic etiology at 12-months, but this trend failed after 24-months.

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Introduction

Seizure control in children following temporal or extra-temporal lobe resection was compared to determine the prognostic value of etiology and/or location of resection. This information may be helpful in assisting parents and children in making the decision to have epilepsy surgery.

Methods

This is a retrospective analysis of 46 consecutive children who had resective surgery for epilepsy. Post-operative follow-up at one year is available for 42 (95%), and at two years 34 (74%). Charts were analyzed for:

- Demographics – age, sex, cognitive / developmental status, age at onset of seizures, etc.
- Seizure outcome based on the Engel Classification and defined as Seizure Free (Engel I), Beneficial (Engel I and II), or Poor (Engel III and IV).
- Etiology as determined by imaging studies prior to surgery as symptomatic (s), or probably symptomatic (ps).
- Location of surgical resection.

The results were analyzed to determine if location of resection and / or etiology correlated with seizure outcome.

Results

There were 25 males, 21 females, 15 had normal development / cognition, 38 were symptomatic, 8 probably symptomatic. Twenty-three had temporal resections, and 23 extra-temporal resections. There were no significant demographic differences between the children who had temporal vs. extra-temporal resections. Twenty-one from each group were available for follow-up at one year. Twelve of the 21 extra-temporal resections were multilobar, and 11/12 involved the temporal lobe (fronto-temporal, temporal parietal, etc.) The one-year post-operative outcome is given in Table 1.

Discussion

In our group, we could not separate seizure free outcome on the basis of location of surgery alone. This may be due to the large number of patients with symptomatic etiology in the temporal resection group (20/21)). Although there is a strong suggestion that Symptomatic etiology as determined on imaging is correlated with a better outcome (21/23 of the seizure free patients), this could not be separated from location of surgery. Overall, 2/3 (28 vs 14) of the patients had a Beneficial Outcome (Engel I – 23, and Engel II – 5).

Conclusions

Seizure Free: Temporal (62%) vs extra-temporal (48%): not statistically different.

Beneficial Outcome: Temporal (81%) vs. extra-temporal (52%): $p < 0.05$.

Seizure Free: Symptomatic (60%-21/35) vs. probably symptomatic (29% - 2/7): $p < 0.03$.

At two years, location of surgery remained significant for Beneficial Outcome. Symptomatic etiology had a 77% Beneficial Outcome, vs. Probably Symptomatic, 33% Beneficial Outcome.

But, the numbers were low, and no significant difference was demonstrated.

Table 1

Outcome (12 mo.) by Area of Resection and Etiology

	Ts	Tps	Ets	Etps
Seizure Free	13 (62%)	0	8 (38%)	2 (10%)
Beneficial	4 (19%)	0	1 (5%)	0
Poor	3 (14%)	1 (5%)	6 (29%)	4 (19%)

Key: T – Temporal S = Symptomatic
ET = Extra-Temporal PS = Probably Symptomatic