Gross Total Resection Improves Long-Term Seizure Control in Patients with Dysembryoplastic Neuroepithelial Tumors

Matthew Z. Sun; Joseph Kim BS; Aaron J. Clark MD PhD; Michael E. Ivan MD; Taemin Oh BA; Michael Safaee BS; Bruce Youm; Michael Oh MD; Orin Bloch BS, MD; Andrew T. Parsa MD PhD

Department of Neurological Surgery

Introduction

Unlike malignant tumors, dysembryoplastic neuroepithelial tumors (DNETs) are low-grade CNS tumors that rarely recur post-operatively and are associated with longer survival. Thus, quality of life is important for DNET patients. Because they commonly present with seizures, post-operative seizure control is critical to quality of life. We performed a systematic literature review to identify potential factors associated with seizure control.

Results

Table 1: Patient Demographics by Extent of Resection.

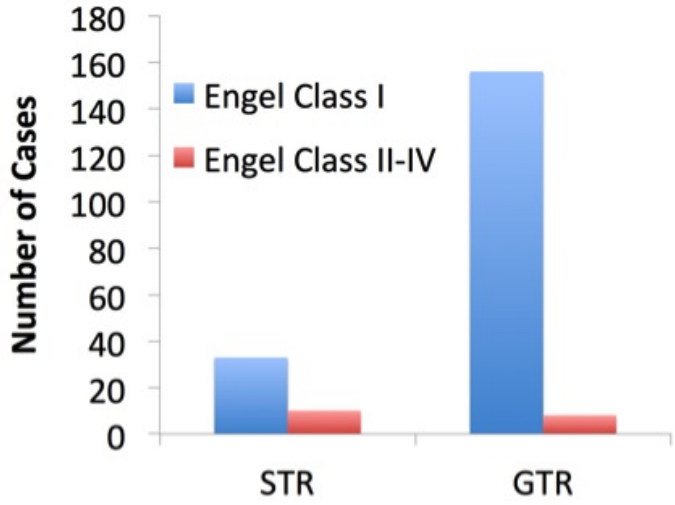
	STR	GTR	P-value
Total number	43	164	
Mean Age ± SD	12.8±10.6	16.9±10.1	0.022
Tumor Location			
Temporal	15	116	0.001
Extra-Temporal	24	45	
Both	4	3	
Surgery Type			
Lesionectomy	35	110	0.091
Lobectomy	8	54	
Seizure Duration Pre-Op	57.4±90.6	72.4±75.0	0.293
Pre-Op Anti-epileptic Drug Use			
Yes	21	109	0.516
No	1	3	

Methods

A Pubmed search was performed to identify articles containing disaggregated clinical information of surgically treated (excluding biopsy) DNET patients. Data for age at diagnosis, duration of preoperative seizures (= vs < 2 years), type of surgery (lesionectomy vs lobectomy), extent of resection (gross total resection (GTR) vs subtotal resection (STR)), tumor location (temporal, extratemporal, or both), and preoperative anti-epileptic drug use were collected. Engel Class 1 defined seizure control. Chi-square tests were used to identify variables that significantly predicted seizure control at 1 year postop, as well as the potential variables for inclusion into multivariate binary logistic regression analysis for determining the most significant factor ($p<0.05$ defining significance).

A total of 72 articles containing disaggregated data on 207 patients with at least 1-year of follow-up were identified. There were significant differences in mean age and tumor location, but no significant differences in type of surgery, mean preoperative seizure duration, and preoperative use of anti-epileptic drugs (Table 1).

Figure 1: Gross Total Resection Improves Long Term Seizure Control



Gross total resection was associated with significantly improved seizure control (Engel Class I) at 1 year after surgery ($p < 0.001$)

Age at diagnosis ($p=0.03$), seizure duration prior to surgery ($p=0.04$), and extent of resection ($p<0.001$) (Figure 1) were significantly associated with seizure control at 1 year.

Using multivariate binary regression analysis, only GTR was significantly associated with greater seizure control at 1-year (Seizure Control Odds Ratio=5.87, 95% CI: 1.16-29.74, $p=0.03$).

Conclusions

GTR was significantly associated with improved seizure control at 1 year for patients with DNET. This data suggests that extent of resection is a critical component of seizure control for patients with this disease, and stresses the importance of GTR when possible.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) describe the importance of seizure control and quality of life for DNET patients; 2) discuss, in small groups, the various factors that could potentially influence long term seizure control; and 3) identify the most significant predictor of long term seizure control for DNET patients treated surgically.

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