

Objective: Anterior temporal lobectomy is a common surgical approach for medication-resistant temporal lobe epilepsy (TLE). Prior studies have shown inconsistent findings regarding the utility of presurgical intracarotid sodium amobarbital testing (IAT; also known as Wada test) and neuroimaging in predicting postoperative seizure control. In the present study, we evaluated the predictive utility of IAT, as well as structural magnetic resonance imaging (MRI) and positron emission tomography (PET), on long-term (3-years) seizure outcome following surgery for TLE.

Participants and Methods: Patients consisted of 107 adults (mean age=38.6, SD=12.2; mean education=13.3 years, SD=2.0; female=47.7%; White=100%) with TLE (mean epilepsy duration =23.0 years, SD=15.7; left TLE surgery=50.5%). We examined whether demographic, clinical (side of resection, resection type [selective vs. non-selective], hemisphere of language dominance, epilepsy duration), and presurgical studies (normal vs. abnormal MRI, normal vs. abnormal PET, correctly lateralizing vs. incorrectly lateralizing IAT) were associated with absolute (cross-sectional) seizure outcome (i.e., freedom vs. recurrence) with a series of chi-squared and t-tests. Additionally, we determined whether presurgical evaluations predicted time to seizure recurrence (longitudinal outcome) over a three-year period with univariate Cox regression models, and we compared survival curves with Mantel-Cox (log rank) tests.

Results: Demographic and clinical variables (including type [selective vs. whole lobectomy] and side of resection) were not associated with seizure outcome. No associations were found among the presurgical variables. Presurgical MRI was not associated with cross-sectional (OR=1.5, $p=.557$, 95% CI=0.4–5.7) or longitudinal (HR=1.2, $p=.641$, 95% CI=0.4–3.9) seizure outcome. Normal PET scan (OR= 4.8, $p=.045$, 95% CI=1.0–24.3) and IAT incorrectly lateralizing to seizure focus (OR=3.9, $p=.018$, 95% CI=1.2–12.9) were associated with higher odds of seizure recurrence. Furthermore, normal PET scan (HR=3.6, $p=.028$, 95% CI =1.0–13.5) and incorrectly lateralized IAT (HR= 2.8, $p=.012$, 95% CI=1.2–7.0) were presurgical predictors of earlier seizure recurrence within three years of TLE surgery. Log rank tests indicated that survival functions were significantly different between patients with normal vs. abnormal PET and incorrectly vs. correctly lateralizing IAT such that these had seizure relapse five and seven months earlier on average (respectively).

Conclusions: Presurgical normal PET scan and incorrectly lateralizing IAT were associated with increased risk of post-surgical seizure recurrence and shorter time-to-seizure relapse.

Categories: Epilepsy/Seizures

Keyword 1: epilepsy / seizure disorders - surgical treatment

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33 Pre-Surgical Evaluation of Bilingual Epilepsy Patients; A Case Study Demonstrating the Importance of Bilingual Assessment

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Objective: In the US, >20% of individuals aged 5 years and older speak a language other than English at home, with rates of bi- and multilingualism increasing. Providing linguistically- and culturally- competent care to increasingly diverse populations is a necessary task for neuropsychologists. The need for close attention to bilingualism is even more glaring in the context of neurosurgical interventions, such as in intractable epilepsy. Pre-surgical epilepsy evaluations serve as a baseline for post-surgical change, inform lateralization and localization, and help determine cognitive risks associated with surgery. The importance of evaluating bilingual status and assessing cognitive abilities in both languages, if needed, in presurgical epilepsy evaluations is examined. We present the neuropsychological profile of a 10-year-old bilingual male with intractable epilepsy participating in a pre-surgical epilepsy evaluation.

Participants and Methods: This right-handed male is a sequential language learner, exposed to Spanish at birth and English when he began kindergarten. His parent reported he was primarily English speaking. Developmental milestones were met within expected

timeframes. Seizures began at age 5. He is prescribed Vimpat and Lamictal. vEEG during admission revealed right temporal-onset seizures. Neuropsychological assessment was conducted in English based on parent report; however, expressive language testing revealed significantly higher performance in Spanish (average) compared to English (exceptionally low). Subsequently, a bilingual provider was consulted, and supplemental Spanish verbal reasoning and verbal memory measures were administered.

Results: The patient's neuropsychological profile captured a significant difference between English and Spanish verbal abilities. WISC-V Similarities scaled scores (ss) were 5 and 11 in English and Spanish, respectively. Vocabulary scaled scores were 8 and 15 in English and Spanish, respectively. Regarding verbal memory, list learning was below average in English (ss = 5), but low average in Spanish (ss = 6). Contextual verbal memory was only administered in Spanish; scores were average (ss = 10). Verbal Fluency administered in English was low (phonemic fluency ss = 5, categorical fluency ss = 6). fMRI verbal tasks were performed in English and revealed left-sided language lateralization.

Conclusions: In pre-surgical epilepsy evaluations of bilingual children, consideration of language is essential. Assessment of language dominance is a minimum requirement in bilingual families, followed by full bilingual evaluation if necessary. In this case, starkly different conclusions regarding lateralization and localization may have been made if the child had not been evaluated in both languages. In English, a significant split between verbal and non-verbal cognition was apparent, possibly suggesting involvement of the dominant left hemisphere. With Spanish testing, this split disappeared, with high average verbal skills. While a growing proportion of children in the US are bilingual, bilingual assessments are not commonly conducted in pre-surgical epilepsy evaluations. In fact, very little work has been done examining language functioning in bilingual epilepsy patients, particularly in children. With both epilepsy-and language-related factors at play in a developing brain, we encourage closer attention to these issues, particularly in the context of neurosurgical procedures.

Categories: Epilepsy/Seizures

Keyword 1: bilingualism/multilingualism

Keyword 2: diversity

Keyword 3: epilepsy / seizure disorders - surgical treatment

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34 Executive Function as a Protective Factor for Post-Surgical Quality of Life in Unilateral Epilepsy Surgery

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Objective: Many epilepsy syndromes are medically refractory, leading patients to be referred for surgical work-up to control their seizures and improve their quality of life (QOL). Although surgical treatments may reduce or stop seizures, many patients continue to present with declines in mood and/or cognition post-operatively. In addition, pre-operative QOL of patients with medically refractory epilepsy is impacted by executive function (EF). The present study aims to investigate the relationship between post-operative mood/QOL and pre-operative EF in adults with epilepsy. It was hypothesized that mood would remain stable or decline post-operatively; pre-operative EF would be a protective factor for mood decline and QOL.

Participants and Methods: The sample consisted of 47 adult patients (57.4% female; Age, M= 34.02(11.59)) with medically refractory epilepsy at the UCSF Epilepsy Center. Participants were included if they received surgical treatment for their epilepsy (42.6% right anterior temporal lobectomy [ATL], 46.8% left ATL, 2.1% laser ablation, 6.4% responsive neurostimulation, 2.1% multiple surgical interventions) and received both a pre- and post-surgical neuropsychological evaluation. Most patients were right-handed (95.7% right). Mood and QOL were assessed from pre- and post-operative evaluations using the Beck Depression Inventory- Second Edition (BDI-II), Beck Anxiety Inventory (BAI), and Quality of Life in Epilepsy- 31 (QOLIE-31). Executive function was assessed using the Trail Making Test, and