Long-Term Seizure, Quality of Life, Depression, and Verbal Memory Outcomes in a Controlled Mesial Temporal Lobe Epilepsy Surgical Series Using Portuguese-Validated Instruments

Luis Augusto Dias, Geisa de Angelis, Wagner Afonso Teixeira, Luiz Augusto Casulari

■ OBJECTIVE: **We aimed to evaluate long-term surgical outcomes in patients treated for mesial temporal lobe epilepsy compared with a similar group of patients who underwent a preoperative evaluation.**

■ METHODS: **Patient interviews were conducted by an independent neuropsychologist and included a sociodemographic questionnaire and validated versions of the Beck Depression Inventory-II, Adverse Events Profile, Quality of Life in Epilepsy-31, and Rey Auditory Verbal Learning Test.**

■ RESULTS: **Seventy-one patients who underwent surgery and 20 who underwent mesial temporal lobe epilepsy preoperative evaluations were interviewed. After an 81-month mean postoperative follow-up, 44% of the surgical patients achieved complete seizure relief according to the Engel classification and 68% according to the International League Against Epilepsy classification. The surgical group had a significantly lower prevalence of depression ($P = 0.002$) and drug-related adverse effects ($P = 0.002$). Improvement on unemployment ($P = 0.02$) was achieved but not on driving or education. Delayed verbal memory recall was impaired in 76% of the surgical and 65% of the control cases ($P = 0.32$). Regarding the Quality of Life in Epilepsy-31, the operated patients scored higher in their total score (mean, 75.44 vs. mean, 60.08; $P < 0.001$) and in all but the cognitive functioning domain irrespective of the follow-up length. Seizure control, Beck Depression Score, and Adverse Events Profile severity explained 73% of the variance in the surgical group quality of life.**

■ CONCLUSIONS: **Our study found that, although surgical treatment was effective, its impact on social indicators was modest. Moreover, the self-reported quality of life relied not only on seizure control but also on depressive symptoms and antiepileptic drug burden.**

INTRODUCTION

Surgical intervention as a treatment option for epilepsy remains largely underused[1,2] despite robust, positive evidence from randomized clinical trials of mesial temporal sclerosis.[3,4] However, improvements in health-related quality of life (QOL) are substantially difficult to assess in limited, short-term studies.[5] Nonetheless, such assessments are important regarding patient aims.[6] In a multicenter trial of resective epilepsy surgery, Spencer et al.[7] reported that the QOL in epilepsy (QOLIE) improves early regardless of the seizure outcome; however, sustained and further developments are related to seizure relief, for which the rate decreases beyond 2 years after mesial temporal sclerosis surgery.[8,9] Moreover, seizure freedom-related

Key words
- Beck Depression Inventory-II
- Epilepsy surgery
- Liverpool Adverse Events Profile
- QOLIE-31
- Rey Auditory Verbal Learning Test

Abbreviations and Acronyms
AED: Antiepileptic drug
AEP: Adverse Events Profile
BDI-II: Beck Depression Inventory-II
ILAE: International League Against Epilepsy
MTLE: Mesial temporal lobe epilepsy
OR: Odds ratio
QOL: Quality of life
QOLIE: Quality of life in epilepsy
QOLIE-31: Quality of Life in Epilepsy-31
SD: Standard deviation

Universidade de Brasilia and Neurosurgical Unit, Hospital de Base do Distrito Federal, Brasilia, Brazil

To whom correspondence should be addressed: Luis Augusto Dias, M.D. [E-mail: luisaugustodias2009@gmail.com; luisaugustodias@terra.com.br]

Citation: World Neurosurg. (2017) 104:411-417.
http://dx.doi.org/10.1016/j.wneu.2017.05.004

*Journal homepage: **www.WORLDNEUROSURGERY.org***

*Available online: **www.sciencedirect.com***

gains that are of paramount importance[10] may be hampered by social-related (e.g., the burden of normality)[11] and treatment-related drawbacks (e.g., new memory deficits and mood disorders).[12] It has been reported that drug toxicity and depression are the highest QOLIE predictors in drug-resistant,[13] well-controlled,[14] and surgical patients.[15] Furthermore, there are notable regional differences worldwide in access to care, socioeconomic disparities, comorbid conditions, treatment choices,[16] and rehabilitation,[17] which should also be considered.

Since the beginning of our surgical program in 2000 in Brasilia, Brazil, we have preoperatively administered freely translated QOL questionnaires and psychometric instruments; however, the reliability and reproducibility of these tools are not sufficient and are a widely encountered problem in the field. The existence of discrepancies in the application of nonvalidated tests to different populations has long been noted.[10] Therefore, lengthy efforts (from 2000 to 2012) have been made by different research groups to overcome the translation, synthesis, back translation, expert committee review, and pretesting processes[18] involved in the full cross-cultural adaptation of the commonly used questionnaires and tests. To date, only short-term studies have been reported that concern the Brazilian population.[19,20]

Thus, in 2012, an investigation of patients who underwent surgical intervention for anterior mesial temporal epilepsy was initiated by using a structured demographic interview, a verbal memory test, and previously validated Brazilian Portuguese versions of widely used patient-based tools. This study was aimed at verifying the effects of surgery and clinical treatment on long-term QOL and its associations with seizure outcome, social relations, depression, and medication side effects, as well as their impact on existing verbal memory deficits.

METHODS

Patient Selection

Adult patients underwent an operation at Hospital de Base do Distrito Federal, Brasília-DF, Brazil, for drug-resistant mesial temporal lobe epilepsy (MTLE), as defined by the International League Against Epilepsy (ILAE).[21] Patients met the inclusion criteria of the electroclinical (video-electroencephalography) presentation of MTLE onset, had solely unilateral disease, showed structural magnetic resonance imaging evidence of hippocampal atrophy, or showed hippocampal sclerosis disease if they were magnetic resonance imaging–negative. Patient ages were encompassed by the QOLIE-31 survey[22] (i.e., 18–60 years old), and there was a minimum follow-up of 3 years.

Patients were excluded from this study if they had associated disease (e.g., hemiconvulsion-hemiplegia-epilepsy syndrome, type II cortical dysplasia) or cognitive or psychiatric impairment that precluded an adequate evaluation or if their residence at the time of the study was in another state.

A similar group of patients with MTLE who were waiting for surgery or video-electroencephalography and who were evaluated before June 2012 were enrolled as the control group.

All patients provided written informed consent for study participation, which was approved by our institution's ethics committee and registered to the Brazilian federal clinical trials registry (Plataforma Brasil) under no. 06623212.1.0000.5553.

Surgical Procedure

All operations were executed by the same surgeon (L.A.D.). A 3.5-cm to 4-cm anterior temporal corticectomy was performed, which spared the superior temporal gyrus (disregarding the side of the disease), combined with an amygdalohippocampectomy, which extended to at least the superior colliculus, as described by Spencer et al.[23]

Interview

From June 2012 to July 2013, all patients underwent a complete, in-person interview (of approximately 1.5 hours duration) by an independent neuropsychologist who had not been involved in the patients' previous investigations or treatments.

The demographic and clinical data questionnaire was adapted, and all neuropsychometric evaluation instruments were selected from the National Institute of Neurological Disorders and Stroke 2011 Common Data Elements Project recommendations.[24] The psychosocial profiling focused on employment, education, driving record, and family bonds (partnership and children). Seizure outcome was based on both Engels classification,[25] which considered groups Ia, I (Ia, Ib, Ic, Id), II, III, and IV, and the 1–6 group ILAE classification,[26] which considered only the most recent year of follow-up. The control group was also classified according to their seizure frequency for comparison.

Each patient's QOLIE, mood, antiepileptic drug (AED) burden, and verbal memory were evaluated by Brazilian Portuguese-validated versions of the following self-report instruments:

Table 1. Patients Who Were Excluded or Refused to Participate

Original Sample	Surgery Group (n = 156)	Medically Treated (n = 34)
Age <18 or >60 years	5	1
Bilateral temporal	1	
Nonlesional*	7	1
Tumoral pathology	11	
Dual pathology†	6	
Selective amygdalohippocampectomy‡	2	
Another surgeon	3	
Cognitive impairment	5	1
Psychiatric disorder	5	2
Living elsewhere	13	2
Total noneligible	58	7
Eligible refused	8	2
Eligible not found	19	5
Total eligible	27	7

*Magnetic resonance imaging and pathology negative.
†Hippocampal atrophy plus another magnetic resonance imaging lesion.
‡Niemeyer technique.