Long-term seizure outcome after mesial temporal lobe epilepsy surgery: cortical amygdalohippocampectomy versus selective amygdalohippocampectomy

TANER TANRIVERDI, M.D.,1 ANDRE OLIVIER, M.D., PH.D.,1 NICOLE POULIN, R.N., M.ED.,1 FREDERICK ANDERMANN, M.D.,2 AND FRANÇOIS DUBEAU, M.D.2

Departments of 1Neurosurgery and 2Neurology, Montreal Neurological Institute and Hospital, McGill University, Montreal, Quebec, Canada

Object. Resection strategies for the treatment of temporal lobe epilepsy (TLE) are a matter of discussion, and little information is available. The aim of this study was to compare seizure outcomes at the 5-year follow-up in patients with medically refractory unilateral mesial TLE (MTLE) due to hippocampal sclerosis (HS) who were treated using a cortical amygdalohippocampectomy (CorAH) or a selective AH (SelAH).

Methods. The authors obtained data from 100 adult patients who underwent surgery for MTLE. Fifty patients underwent a CorAH and 50 underwent an SelAH. Seizure control achieved with each technique was compared using the Engel classification scheme.

Results. Overall, at the 5-year follow-up, favorable (Engel Classes I and II) seizure outcomes were noted in 82 and 90% of patients who had undergone CorAH and SelAH, respectively. Furthermore, 40% of the patients who had undergone a CorAH and 58% of those who had undergone an SelAH were seizure free (Engel Class Ia). There was no statistically significant difference between the 2 surgical approaches in terms of seizure outcome at the 5-year follow-up (p = 0.38).

Conclusions. Both CorAH and SelAH can lead to similar favorable seizure control in patients with MTLE/HS. However, the authors suggest that the transcortical selective approach has the great advantage of minimizing or completely abolishing the impact of dividing several venous and arterial adhesions which are tedious, time consuming, and, at times, associated with some degree of cerebral swelling. (DOI: 10.3171/JNS/2008/108/3/0517)

KEY WORDS • anterior temporal lobe resection • cortical amygdalohippocampectomy • epilepsy surgery • seizure outcome • selective amygdalohippocampectomy

Abbreviations used in this paper: AH = amygdalohippocampectomy; CorAH = cortical AH; ECoG = electrocorticography; EEG = electroencephalography; HS = hippocampal sclerosis; MNI = Montreal Neurological Institute; MR = magnetic resonance; MTLE = mesial temporal lobe epilepsy; SD = standard deviation; SelAH = selective AH.

Because most centers use 1 preferred surgical approach for MTLE/HS, comparisons in terms of seizure outcome or cognitive changes can only be made with the results from other centers where different types of surgical strategies are...
used. Thus, there is a paucity of data directly comparing SelAH and CorAH, or what is sometimes inappropriately called an “anterior temporal lobectomy,” in terms of seizure outcome in a single center. To the best of our knowledge, the authors of only 5 studies have specifically compared seizure outcomes between SelAH and CorAH. Some of these studies consisted of unequal numbers of patients in each group and short follow-up periods, and some included patients with variable profiles of abnormalities in mesial structures and different follow-up durations for each surgical group. In this report, we selected equal numbers of patients who had a very homogeneous clinical picture with unilateral mesial temporal structure atrophy in MR imaging, were uniformly evaluated, underwent surgery through either an SelAH or CorAH, and underwent surgery performed by the same surgeon (A.O.). The comparison of 5-year seizure outcomes of these 2 surgical techniques is the subject of this report.

**Clinical Material and Methods**

**Patient Population**

Between 1986 and 2001, a total of 1077 patients underwent MTLE/HS surgery for medically intractable epilepsy at MNI. For this study the inclusion criteria were as follows: patients who 1) were ≥ 16 years old; 2) had similar clinical profiles; 3) had complete clinical, neuropsychological, electrophysiological, neuropsychological, and surgical data; 4) had interictal and ictal scalp/sphenoidal and intracranial depth electrode EEG studies displaying unilateral independent anteromesial temporal epileptic discharges; 5) had MR imaging or histopathological findings characteristic of HS; 6) had not undergone reoperation; and 7) had a follow-up duration of ≥ 5 years.

A list of all patients who underwent SelAH or CorAH between 1986 and 2001 was obtained from the epilepsy surgery database. All patients were seen at regular follow-up examinations by the referring neurologist and the surgeon. Data used for this analysis included the following clinical and demographic parameters: 1) age at seizure onset; 2) duration of epilepsy; 3) seizure frequency; 4) history of febrile seizure; 5) age at febrile seizure; 6) febrile seizure frequency; 7) duration of febrile seizure; 8) family history of seizure; 9) developmental delay (yes/no); 10) perinatal difficulties (yes/no); 11) history of status epilepticus; 12) head trauma; 13) secondary generalization; 14) history of meningitis/encephalitis; and 15) age at surgery.

**First Cohort: Patients With CorAH**

The first group included the first 50 patients who had undergone CorAH for MTLE/HS between March 1986 and January 1990 and who met our inclusion criteria. These individuals were selected from a total of 336 patients who had undergone surgery for intractable epilepsy. This group consisted of 19 male and 31 female patients with a mean age of 34.1 ± 12.2 years. The mean patient age at seizure onset was 12.3 ± 9 years, and all patients had complex partial seizures. Twenty patients in this cohort showed secondary generalization. Twenty-four patients underwent surgery on the right side and 26 patients on the left side.

**Second Cohort: Patients With SelAH**

The patients within the second group consisted of the first 50 patients who met our inclusion criteria and had undergone SelAH for MTLE/HS between January 1991 and April 2001. These individuals were drawn from a total of 741 patients who had undergone surgery for intractable epilepsy during the same period. This group consisted of 18 male and 32 female patients with mean age of 37.6 ± 11.6 years. The mean patient age at seizure onset was 13.7 ± 11 years. All had complex partial seizures and 23 patients had secondary generalization. Thirty-three patients underwent surgery on the right side and 27 on the left side.

Data regarding clinical and surgical variables in the 2 categories are listed in Table 1.

### TABLE 1

<table>
<thead>
<tr>
<th>Factor</th>
<th>AH Cohort*</th>
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<tr>
<td></td>
<td>Cortical (50 patients)</td>
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<tr>
<td>mean age (yrs)</td>
<td>34.14 ± 12.24</td>
</tr>
<tr>
<td>sex (M/F)</td>
<td>19/31</td>
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<tr>
<td>handedness (rt/lt/both)</td>
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<td>mean age at onset (yrs)</td>
<td>12.36 ± 9.8</td>
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<tr>
<td>mean duration of seizures (yrs)</td>
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<tr>
<td>mean frequency of seizures (mos)</td>
<td>24.24 ± 6.9</td>
</tr>
<tr>
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<td>2/48</td>
</tr>
<tr>
<td>aura (yes/no)</td>
<td>35/15</td>
</tr>
<tr>
<td>secondary generalization (yes/no)</td>
<td>20/30</td>
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</tr>
<tr>
<td>febrile seizure (yes/no)</td>
<td>13/37</td>
</tr>
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<td>mean age at onset of febrile seizure (yrs)</td>
<td>1.81 ± 1.2</td>
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<td>mean duration of febrile seizure (yrs)</td>
<td>1.92 ± 1.6</td>
</tr>
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<td>mean frequency of febrile seizure (days)</td>
<td>1.42 ± 0.7</td>
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<td>8/42</td>
</tr>
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<td>perinatal difficulties (yes/no)</td>
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<td>developmental delay (yes/no)</td>
<td>3/47</td>
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<td>history of trauma (yes/no)</td>
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<td>history of meningitis or encephalitis (yes/no)</td>
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<tr>
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<td></td>
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<td>hippocampal atrophy (rt/lt)</td>
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<td>mean age at op (yrs)</td>
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<tr>
<td>side of op (rt/lt)</td>
<td>24/26</td>
</tr>
<tr>
<td>pathological finding (sclerosis/gliosis)</td>
<td>21/28</td>
</tr>
<tr>
<td>mean follow-up (yrs)</td>
<td>10.9 ± 5</td>
</tr>
</tbody>
</table>

* Mean values are reported as the means ± SDs.
Electrophysiological evaluations included scalp and sphenoidal interictal and ictal EEGs. Intraoperative ECoG was performed routinely in cases of CorAH and exception- ally in SelAH. Prolonged video-EEG with scalp/sphenoidal electrodes was performed to record interictal and ictal spikes during wakefulness and sleep in all patients. Intracranial stereo-EEG recording with stereotactically implanted electrodes were performed in 5 and 7 patients with CorAH and SelAH, respectively, because the extracranial EEG recordings did not provide clear localization or lateralization of seizure onset. Furthermore, when needed, ECoG recording was used in patients to see whether there was epileptic activity coming from the neocortex.

Neuropsychological testing, with an emphasis on verbal and visual memory, visuospatial abilities, and language functions, was performed preoperatively in all patients. The standardized neuropsychological test battery included the full intelligence scale (Wechsler Adult Intelligence Scale–Revised), verbal (story learning test, abstract words learning test, and the Rey auditory verbal learning test), nonverbal, and learning (the Rey–Osterrieth Complex Figure Test, and Batterie de Mnésique 144 design recognition test and abstract design learning test) tests. Patients in whom there were uncertainties about memory reserve or lateralization of language underwent bilateral intracarotid sodium amobarbital tests.

**Surgical Procedures**

Between 1986 and 1990 (when the first group underwent surgery), CorAH was considered the standard procedure at MNI for treatment of MTLE/HS. In CorAH, the goal is to perform a temporal neocortical resection, extending habitual 5 cm along the sylvian fissure and 5–5.5 cm along the floor of the middle fossa on the nondominant side and 4.5–5 cm in the dominant side, together with total or partial resection of the amygdala and uncus, and 2.5–3 cm removal of the hippocampus and parahippocampal gyrus. The surgical procedure has been described in detail elsewhere.\(^{37,38}\) Between 1991 and 2001 (when the second group underwent surgery), SelAH became the main surgical procedure. Briefly, transcortical SelAH, a procedure that has been described in greater detail elsewhere,\(^{31}\) involves performing either a pterional craniotomy or a centered craniectomy with incision along the superior bank of the second temporo-ral gyrus, subpial extension of this line of entry down along the superior temporal sulcus, across the temporal white matter, and into the temporal horn of the lateral ventricle. Inside the ventricle, the hippocampus, amygdala, entorhinal cortex, and uncus are resected by endoscopic technique performed by the same surgeon.\(^{32}\) The steps of the procedure are performed with neuronavigation. The evolution of the surgical procedure paralleled the advancements in neuroimaging techniques and understanding of the epileptogenic basis of MTLE/HS. At MNI, our work with chronic depth electrode recording has confirmed the overwhelming predominance of temporal seizure onset from limbic structures.\(^{33,34}\) In patients with bitemporal epilepsy, it has been shown that the seizures arise predominantly from 1 temporal lobe and, within that temporal lobe, usually from the amygdala or hippocampus > 80% of the time.\(^{34}\) Seizures of neocortical onset have been relatively rare, but are well documented. Relying more and more heavily on the morphological and electrophysiological changes seen in the limbic structures on MR imaging and EEG, we have performed more frequently the transcortical SelAH, which has become the procedure of choice in cases of mesiotemporal limbic epilepsy, that is, when the seizure pattern, the EEG findings, and the morphological stigmata are congruent.\(^{35}\)

**Histopathological Study**

Hippocampal tissue sufficient for histopathological diagnosis was available in all patients. The resected specimens were histopathologically examined with previously described techniques.\(^{36}\) A standard neuropsychopathological protocol was generally used for all epilepsy cases. The qualitative assessment of pattern of cell loss, gliosis, and HS in hippocampal subfields CA1, CA3, and in the dentate gyrus was applied.

**Postoperative Evaluation**

Patients were discharged from the hospital and placed on therapeutic dosages of \(\geq\) 1 first-line antiepileptic drugs. Follow-up examinations were conducted at 6 weeks, 6 months, and yearly thereafter, either through outpatient visits or telephone interviews. Outcome was assessed independently by the neurological and neurosurgical teams. Patients and relatives were instructed to report seizure recurrences by telephone between scheduled outpatient visits, and these data were entered into a structured outcome data sheet. Interviews for follow-up purposes involved questioning patients or relatives about the recurrence of symptoms and signs suggestive of complex partial, partial motor, or generalized tonic–clonic seizures. All patients underwent MR imaging, scalp EEG, and neuropsychological evaluations during the follow-up period.

Outcome at the 5-year follow-up in relation to seizure control was based on the modified Engel classification,\(^{9}\) using all 12 subclasses as follows: Class I, seizure free (Ia, completely seizure free since surgery; Ib, auras only since surgery; Ic, some seizures after surgery but seizure free for \(\geq\) 2 years; and Id, generalized convulsions following antiepileptic withdrawal only); Class II, rare seizures, with a maximum of 3 seizures per year (IIa, initially seizure free but currently has rare seizures; IIb, rare seizures since surgery; Iic, rare seizures for \(\geq\) 2 years; and IId, nocturnal seizures only, causing no disability); Class III, worthwhile improvement with a \(> 90\%\) reduction of seizures (IIIA, worthwhile seizure reduction; and IIIB, prolonged seizure-free intervals for more than half of the follow-up but not \(<\) 2 years); and Class IV, no worthwhile improvement (\(<\) 90\% reduction in seizure frequency; IVa, 60–90% reduction; IVb, no appreciable difference \(<\) 60% reduction). For categorical comparisons, this classification was divided into favorable (Engel Classes I and II) and unfavorable (Engel Classes III and IV) seizure outcome.

**Statistical Analysis**

All data collected from each patient were organized in a database (Excel, Microsoft Corp.). Numeric variables were provided as the mean \(\pm\) SD. For statistical analysis, we performed independent sample t-tests for comparing patient demographics and clinical characteristics between the 2 groups. We used chi-square analyses to compare seizure...
outcomes for different surgical procedures. For smaller contingency tables, we used the Fisher exact test. A probability value $< 0.05$ was considered statistically significant. All statistical calculations were performed using commercially available software (SPSS version 11.0.1, SPSS Inc.).

**Results**

The follow-up period was $> 5$ years for all patients, and data were available at the 5-year follow-up in all patients.

**Clinical Findings and Demographic Data**

Demographic and clinical data are summarized in Table 1. Patients who underwent a CorAH or SelAH had very similar clinical and demographic characteristics. There was no statistically significant difference between the 2 groups in terms of patient demographics, seizure characteristics, patient history, surgical features, and follow-up duration.

**Overall Seizure Outcome at 5 Years Postoperatively**

At the 5-year follow-up, 86 patients (86%) were included in favorable seizure outcome (Engel Classes I and II) and 14 patients (14%) showed unfavorable seizure outcome (Engel Classes III and IV) (Fig. 1). A total of 49 patients (49%) were completely seizure free (Engel Class Ia) without aura after tough questioning concerning of presence or absence of aura (Fig. 2). No patient suffered worsening of seizure frequency or severity following surgery (Engel Class IVb).

**Seizure Outcome for CorAH and SelAH at the 5-Year Follow-Up**

A favorable seizure outcome at the 5-year follow-up was documented in 41 patients (82%) and 45 patients (90%) in the CorAH and SelAH groups, respectively (Fig. 3). There was no statistical difference between the 2 different surgical approaches in terms of seizure outcome at the 5-year follow-up ($p = 0.38$, chi-square test). The numbers and equivalent percentages falling into each Engel class at the 5-year follow-up are listed in Table 2. We also did not find a statistically significant difference between the 2 groups regarding each subclass at the 5-year follow-up. Although seizure freedom (Engel Class Ia) seemed to be attained more rapidly following SelAH than CorAH during the first 2–3 years, on long-term follow-up the percentages of patients in Classes I and II in both groups were similar. Therefore, at the 5-year follow-up the difference between groups was not statistically significant.

**Postoperative Complications**

There were neither intra- nor postoperative deaths nor any significant neurological deficits in this series. Surgical complications occurred in 5 patients (6%) who underwent CorAH and in 1 patient (2%) who underwent SelAH. Nonoperative complications (pulmonary embolism) without sequelae occurred in only 2 patients (4%) in the CorAH group. The complications other than upper quadrantanopia were transitory and had resolved by the time of discharge from the hospital (Table 3).
intrinsic unpredictability, which causes irreversible damage. Consequently, results of studies dealing with relatively short-term outcomes should be interpreted cautiously.

Seizure Outcome in CorAH and SelAH

Our results demonstrated that there is no significant difference between CorAH and SelAH in terms of seizure outcome at the 5-year follow-up. It has been shown that both CorAH or anterior temporal resection (or what is sometimes inappropriately called a temporal lobectomy) and SelAH are effective and safe procedures in patients with intractable MTLE/HS.\(^2,4,27,31,34–37,49\) However, much debate exists given that the authors of some studies have claimed that a more restricted resection such as SelAH offers advantages in terms of seizure outcome,\(^6,43,49\) whereas others have not found significant differences between the 2 types of surgery.\(^2,35,36\)

The comparison between 2 modalities is difficult because most centers usually perform 1 preferred procedure and comparison usually relies on the results reported by other centers. To our knowledge, there have been only 5 studies in which the authors specifically compared the surgical results of CorAH and SelAH in terms of seizure outcome at a single center.\(^2,3,18,35,36\)

The first study was from our center and included 74 patients with MTLE/HS.\(^3\) The CorAH and SelAH procedures were performed in an equal number of patients (37 in both groups), and the results in terms of seizure outcome were compared. No statistically significant difference was found between the 2 procedures in seizure control at the 1-year follow-up. Patients with unilateral atrophy had significantly better results than those with bilateral or no atrophy. The authors concluded that better results were achieved with SelAH as a more conservative procedure. This study included patients with uni- or bilateral hippocampal atrophy or patients with no atrophy, and the follow-up period was short.

The authors of the second study compared the results in terms of seizure outcome at the 1-year follow-up of 72 and 28 patients who underwent CorAH and SelAH, respectively.\(^18\) They found that CorAH was more effective than SelAH in terms of seizure control. However, these authors also evaluated the results with a rather short-term follow-up, and the patients had different types of pathological entities within the temporal lobe.

The third study compared long-term seizure outcome in 79 patients who underwent CorAH and in 56 patients who underwent SelAH.\(^35\) At the 10-year follow-up, no significant difference in the achievement of Engel Class Ia was found between the 2 groups, and survival analysis showed the rate of seizure freedom (Engel Class Ia) decreased from 85 to 74% between the 1st and 5th year after surgery. The rate of seizure freedom was found to be 66% at 10 years. The authors suggested that less favorable surgical outcomes for MTLE/HS over the years should not be systematically attributed to the remaining temporal neocortex or to the preservation of the posterior portion of the hippocampus. However, they did not mention whether the patients specified as seizure free or Engel Class Ia had an aura.

In the fourth study, no statistically significant difference was found in 80 patients with CorAH and 81 patients with SelAH in regard to Engel class or subclass at the 6.7-year (for CorAH) and 4.5-year (for SelAH) follow-up periods.\(^36\) A recently published study compared the seizure outcome at the 1-year follow-up of patients who had CorAH (82 patients) and those who had SelAH (32 patients), and a statistically significant difference between these 2 surgical types was found.\(^3\) The authors concluded that CorAH was
more effective in controlling seizures than SelAH in patients with MTLE/HS.

The authors of the fifth study compared unequal numbers of patients in each group after a short follow-up time. We reported findings that were similar to those of Arruda et al.2 and Paglioli et al.,35,36 who compared CorAH and SelAH in a homogeneous large group of patients with MTLE/HS after long-term follow-up. Our results demonstrated that the rate of seizure freedom without aura (Engel Class Ia) ranged from 73% to 49% at 1 and 5 years after surgery, respectively. In a large cohort of patients with MTLE of various origins, Clusmann and colleagues’ reported findings similar to ours and stated that seizure outcome is mainly dependent on diagnosis and clinical factors.

**Surgical Methods**

In this study, we found that both surgical strategies are effective and that there is no significant difference in terms of seizure outcome at long-term follow-up. At MNI, our surgical strategy changed in 1990; the cohorts in the pre-1990 era formed the method of choice (the second cohort). We chose the transcortical SelAH approach initially proposed by Niemeyer27 to avoid manipulation of the Sylvian vessels and to prevent disconnection of the anterior portion of the temporal stem, which can result from the transsylvian technique. The main finding regarding these 2 cohorts is that despite the reduction in the amount of resected tissue, the success rate remained stable. A comparison of CorAH and SelAH performed in this series revealed a similar rate of seizure control: a satisfactory seizure control (Classes I and II) at the 5-year follow-up was achieved in 82% and 90% of patients in the CorAH and SelAH groups, respectively. When we compare subclasses, the results are also similar. For 50 patients in the CorAH group, the frequency falling into each of the Engel classes are as follows: Ia (40%), Ib (10%), Ic (6%), Id (8%), Ila (8%), Ilb (4%), Ilc (6%), IIIa (10%), IIIb (2%), and IVa (6%). For 50 patients who underwent SelAH, the frequencies are as follows: Ia (58%), Ib (6%), Ila (22%), Ilc (2%), Id (2%), and IIla (10%). No patient in either group experienced worsened seizure frequency (Engel Class IVb) following surgery at the 5-year follow-up (Table 2). On reviewing the literature, we found that there is no common consensus stating that the extent of the resection has an effect on seizure outcome. The authors of some studies have reported that the extent of the mesial temporal resection had no effect,5,13,15,20,45 but others have reported that a greater extent of mesial temporal resection (in patients with a mesial or unilateral anterior temporal lobe focus) had a significant association with good outcome.3,13,14,26,51 It should be noted that if the site of seizure origin resides in the damaged structures then these should be resected as radically and selectively as possible.31 The larger cortical removal in standard resection should not become, or remain, simply a method of exposing the limbic structures.31 Finally, the transcortical SelAH approach has the great advantage of minimizing or completely abolishing the impact of dividing several venous and arterial blood vessels, which is tedious, time consuming, and, at times, associated with some degree of cerebral swelling.31

**Postoperative Complications**

There were no surgery-related significant neurological deficits and deaths in this series. Surgery-related complications were seen in only 4 patients (4%). This rate compares favorably with the reported rate ranging from 4 to 5.4% in larger studies.39,41,43,46,49 In our study, only 1 patient in the SelAH group experienced a complication (upper quadrantanopia). In the CorAH group, subgaleal fluid accumulation was encountered in 1 patient, and it completely resolved after insertion of a lumbar catheter. One patient had

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**TABLE 2**

<table>
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<tr>
<th>Engel Class</th>
<th>CorAH</th>
<th>SelAH</th>
<th>p Value</th>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td>20 (40)</td>
<td>29 (58)</td>
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</tr>
<tr>
<td>b</td>
<td>5 (10)</td>
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<tr>
<td>c</td>
<td>3 (6)</td>
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</tr>
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<td>d</td>
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<td></td>
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<td>a</td>
<td>4 (8)</td>
<td>11 (22)</td>
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<tr>
<td>b</td>
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<td>1 (2)</td>
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<tr>
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<td>44 (88)</td>
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</tr>
<tr>
<td>UFO (Engel Classes III &amp; IV)</td>
<td>9 (18)</td>
<td>6 (12)</td>
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* FO = favorable outcome; NA = not applicable; NS = nonsignificant; UFO = unfavorable outcome.

**TABLE 3**

<table>
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<th>Complication</th>
<th>No. of Patients</th>
<th>Cortical</th>
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<td>0</td>
<td>no sequela</td>
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<td>1</td>
<td>0</td>
<td>no sequela</td>
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<td>upper quadrantanopia</td>
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<td>1</td>
<td>persisted</td>
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<td>2</td>
<td>0</td>
<td>no sequela</td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>5</td>
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<td></td>
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</tr>
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</table>

* CSF = cerebrospinal fluid.
Epilepsy surgery

a postoperative noncompressive epidural hematoma; by the

time of hospital discharge it had resolved completely. Non-

operative complications, namely pulmonary edema, were

seen in 2 patients in the CorAH group and were treated

using anticoagulation therapy; the patients suffered no se-

quelae. In addition, 1 patient in the CorAH group exhibited

upper quadrantanopia.

We stress that the definition of a complication may be

open for discussion given that some postoperative distur-

bances have been considered as acceptable side effects and

not as complications if they resolved completely within a

few days. Thus, for example, brain edema may cause sim-

ple transient side effects such as dizziness, mild hemipa-

resis, aphasia, and numbness in extremities, which general-

ly resolve after antiedema medication. Furthermore, some

permanent visual field defects should also not be classified

as complications, because they may be unavoidable in both

surgical techniques. In this series, the overall rate of mor-

bidity related to surgery amounted to 4%, which is well

within the range of those in the literature.39,41,43,46,49

Methodological Limitations

We realize that there are methodological limitations to

the study. First, this study is retrospective, and we did not

randomize the patients to either operation. Second, the

study should have included a large population of patients,

and we included limited number of patients (50) in each

group. Therefore, the likelihood of Type II errors may be

high, which account for the high proportion of null or in-

conclusive findings. Although the desired power in cohort

studies is usually 80–90%, the statistical power of our study

was found to be 76%. Thus, we suggest that future studies

should be prospective and randomized and include a great-

er number of patients.

Conclusions

In this study, we have demonstrated that 2 basic surgical

 modalities used in the treatment of patients with MTLE/HS

can lead to similar favorable seizure control. Approxi-

mately 82–90% of patients who had undergone either

CorAH or SeLAH had attained a favorable outcome at the

5-year follow-up, and both procedures were similarly asso-

ciated with no difference in terms of seizure outcome.

Thus, seizure freedom is likely not to be a decisive factor

in favoring one technique over the other. Temporal en bloc

lobectomy may still have its place in specific instances.

However, the advances in intracranial recording and brain

imaging, as well as consideration of patients with impaired

memory, has imposed on the surgeon the need to consider

various types of resection individualized for each patient.

Over the last 20 years, there has been a definite trend in

the amount of removal of limbic structures. This has led

surgeons in many centers to use, more and more frequent-

ly, selective limbic removal through a variety of approach-

es. We have found that the transcortical selective approach

has the great advantage of minimizing or completely abol-

ishing the impact of dividing several venous and arterial

blood vessels which are tedious, time consuming and, at

times, associated with some degree of cerebral swelling.

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