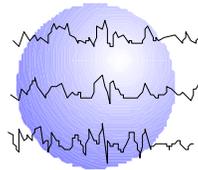


# **BEHAVIORAL CHANGES IN RIGHT TEMPORAL LOBECTOMY PATIENTS PRE AND POSTOPERATIVELY**

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## REVISED ABSTRACT

**RATIONALE:** Behavioral abnormalities (BA) including affective difficulties are common in patients with right temporal lobe epilepsy (RTE). This study examines the preoperative incidence of and the postoperative effect of surgery on these complaints.

**METHODS:** We performed retrospective chart reviews of 50 adult patients with RTE who underwent right temporal lobectomy (RTL) between 1991-2000. All complaints of mood and behavioral difficulties (e.g., depression, anxiety, explosive disorder) were tabulated. Intracranial electrodes were utilized in 21 procedures to define epileptic focality unclear from surface recordings. The left hemisphere was dominant in 44. MRI revealed unilateral right mesial temporal sclerosis (MTS) in 30; bilateral MTS in 2; and other right structural lesions in 5. Full Scale IQ (FSIQ) was less than 80 in 5 patients. Pathology reported gliosis in 98%. Postoperative (postop) follow up ranged from 7-113 months.

**RESULTS:** History revealed preoperative (preop) complaints of BA in 33/50. Postop early BA at 1 month showed worsening in 10 (20%), improvement in 12 (24%), and no change in 27 (54%). Of the 10 who initially worsened, 3 improved over the next year. All 50 patients had follow-up beyond 6 months. 33 (67%) had no BA or improved postop BA, of whom 22 (70%) had reported prior preop BA; 6 (12%) had worsened from preop status and 21 (43%) had no change. Of the 32 patients with MTS, 20 had preop BA which improved in 13 (65%); 4 of the MTS patients developed BA. Of the 16 patients without MTS, 11 had preop BA and 7 of this group improved. BA was present in all 5 with structural lesions, 4 improved and 1 had no change in BA. Three patients with low FSIQ had preop BA which improved in two. Seizure outcome was Engel Class I in 90%.

**CONCLUSIONS:** 66% of our patients with RTE had BA preop. After RTL, 26% had persistent BA despite Class I surgical outcome. Persistent BA did not correlate with FSIQ or structural or pathological findings. The presence of preop BA does not preclude successful surgical outcome or improved behavior status.

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## **INTRODUCTION**

Patients with temporal lobe epilepsy have psychological symptoms ranging from affective disorders to psychosis. Temporal lobectomy may improve cognitive and affective function. The patient's behavioral status is considered one of the factors in choosing appropriate surgical candidates. We retrospectively reviewed 50 surgical patients with right temporal lobectomy (RTL) with regard to their behavioral status preoperatively and postoperatively to evaluate clinical course and predictive factors for outcome.

## **METHODS**

Fifty retrospective chart reviews of adult patients with RTL were conducted and each patient was rated for the presence or absence of behavioral abnormalities pre- and postoperatively. Behavioral abnormalities (BA) were defined as depression, dysphoria, anger outbursts and anxiety. Psychoses were not included. Early postoperative period was defined within the one month postoperative period. Late postoperative period was defined as later than six months.

## **RESULTS**

Patients were age 18 - 56 at time of RTL. Follow-up ranged from 7 to 113 months. Twenty-one patients had intracranial electrodes implanted prior to RTL. Only two patients were right dominant; 44 were left dominant, and two had some bilateral speech representation based on intracarotid amobarbital procedure (IAP). Two patients did not have IAP. There were three deaths, all late postoperative: 1 murder, 1 probable SUDEP, one asphyxiation due to noncompliance and nocturnal seizure. Demographic data, IQ, and preoperative MRI results are shown in Table 1.

Sixty-six percent of patients with RTL had preop BA prior to surgery (Table 2). Most (54%) developed no early BA; 20% developed BA of which 70% were persistent.

Follow-up revealed no late BA in 34 patients (68%) of whom 22 (70%) had had prior pre-op BA, 6 (12%) had worsened from preop status and 20 (48%) had had no change. 35% of patients with normal IQ had preop BA and showed little chance of improving. Patients with low IQ had a 60% incidence of preop BA but did well (100% improved).

The presence or absence of MTS did not predict presence of preop BA. There was no statistical difference between the incidence of BA preoperatively or postoperatively nor in the likelihood of improvement after resection.

Patients with preop BA achieved Engel Class I outcomes in 97%. In patients with Class I outcome, late BA occurred in 25%, only 5% of whom were new onset BA (Figure 2). Patients who achieved Class II outcome despite improvement in seizure frequency had a higher risk of late BA (Figure 3).

Patients with non MTS structural lesions all had baseline BA, with four of five improving; all had Class I outcome.

## **DISCUSSION**

Surgery for uncontrolled partial epilepsy from the temporal lobe is an effective treatment for medically intractable seizures. Depression and other behavioral abnormalities have been described previously<sup>1-6</sup>.

This retrospective study looked only at patients with right temporal epilepsy and at historical descriptors of behavior before and after RTL. We evaluated the effect of IQ, MTS and other structural lesions, and seizure outcome on the incidence of BA and postoperative improvement. The presence of preoperative BA does not preclude good surgical outcome. Estimated probability of improvement with preoperative BA was 52%. The probability of developing new late BA was 35%. Although the numbers were small in the subgroups precluding statistical significance, patients with low IQ and/or non-MTS structural lesions tended to show resolution of BA.

Our prevalence of preoperative BA (60%) and postoperative BA (33%) is similar to previously published results of 57% and 39% respectively<sup>7</sup>. Few patients worsen from baseline. In a small number of our patients, the extent of preoperative BA was severe enough to engender discussion as to whether the patient and/or the institution could endure the evaluation and the procedure. No patient decompensated to an unsafe clinical condition. Some patients were delayed for resection in order to stabilize behaviors with medications and/or counseling and/or increase the supports within the personal home environment.

## **CONCLUSIONS**

1. 90% of patients had a Class I Engel outcome. 100% had Class I or Class II.
2. In patients undergoing RTL, those who have behavioral abnormalities at baseline do well behaviorally, remaining stable or improving in a majority of cases.
3. Baseline behavioral abnormalities are not a contraindication for surgical resection.
4. Late development of behavioral abnormalities in a small minority of patients does not preclude a good surgical outcome.
5. Patients with MTS or other structural lesions or with low IQ who have baseline preoperative behavioral abnormalities are likely to improve postoperatively.

## **REFERENCES**

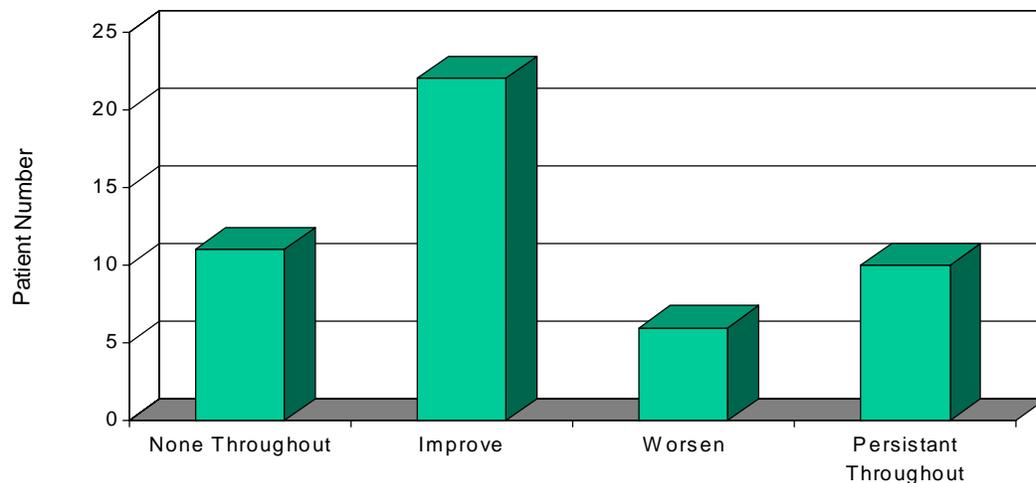
1. Derry PA, Rose KJ, McLachlan RS. Moderators of the effect of preoperative adjustment on postoperative depression after surgery for temporal lobe epilepsy. *Epilepsia*, 41:177-185, 2000.
2. Gibbs FA, Gibbs EL. Atlas of Electroencephalography, Vol 2 and 3. Cambridge, MA. Addison-Wesley Press, 1964.
3. Flor-Henry P. Ictal and interictal manifestations in epilepsy: specific or non-specific. *Epilepsia*, 13:773-783, 1972.
4. Burton LA, Labar D. Emotional status after right vs. left temporal lobectomy. *Seizure*, 8:116-119, 1999.
5. Altshuler LL, Devinsky O, Post RM, Theodore M. Depression anxiety and temporal lobe epilepsy: laterality of focus on symptoms. *Arch Neurol*, 47:284-288, 1990.
6. Kohler C, Norstrand JA, Baltuch G, et al. Depression in temporal lobe epilepsy before epilepsy surgery. *Epilepsia*, 40:336-340, 1999.
7. Blumer D, Wakhlu S, Davies K, Hermann B. Psychiatric outcome of temporal lobectomy for epilepsy: incidence and treatment of psychiatric complications. *Epilepsia*, 39:478-486, 1998.

**Table 1****DEMOGRAPHICS RIGHT TEMPORAL LOBECTOMY PATIENTS (n = 50)**

Male	26	MTS by MRI:	Right	30
Female	24		Bilat	2
IQ > 80	43		Unavail	2
IQ < 80	5		Absent	16
IQ - NA	2	Other Lesions:		5

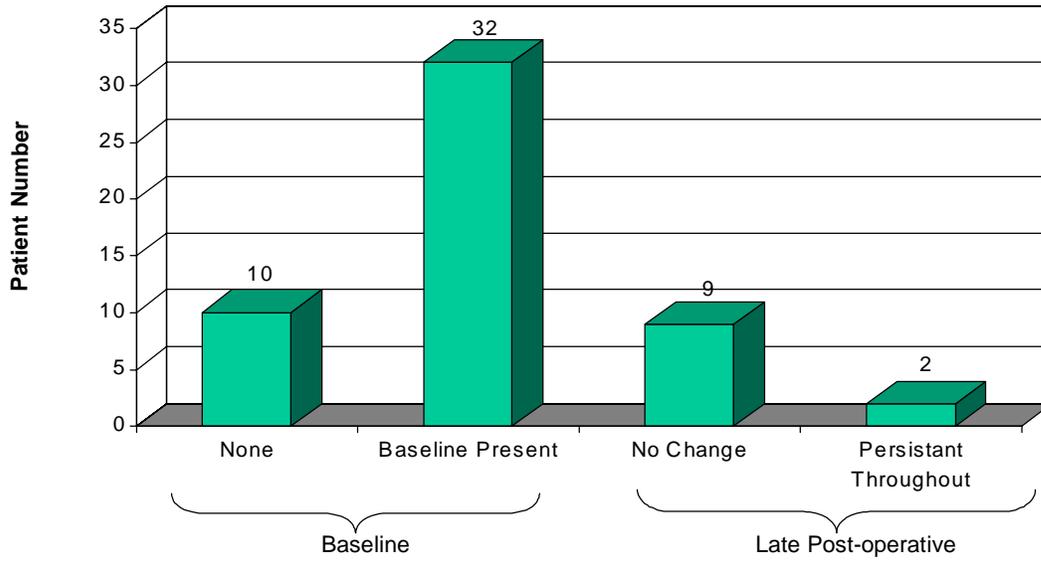
**Table 2****PRESENCE OF BEHAVIORAL ABNORMALITIES**

	N	N Baseline (%)	Post Op		% Pts Improve Baseline to LPO
			Early (%)	Late (%)	
RTL Patients	50	33 (66)	30 (60)	16 (33)	52%
IQ > 80	43	15 (35)	27 (63)	14 (34)	8%
IQ < 80	5	3 (60)	2 (40)	0 (0)	100%
MTS by MRI*	32	20 (62)	18 (44)	10 (23)	50%
No MTS	16	11 (70)	11 (70)	6 (37)	45%
Structural Lesion	5	5 (100)	2 (40)	1 (20)	80%

**Figure 1****COURSE OF BEHAVIORAL ABNORMALITIES PREOPERATIVE TO LATE POSTOPERATIVE**

**Figure 2**

**BEHAVIORAL ABNORMALITIES IN PATIENTS WITH CLASS I OUTCOME**



**Figure 3**

**BEHAVIORAL ABNORMALITIES**

