

# Memory for verbal material after temporal lobectomy in Spanish sample

Orozco, C.\*, Puente, A.E.\*\*, Verdejo, A.\*, Pastor-Pons, E.\*\*\*, Altuzarra, A.\*\*\*\*, Castañeda, M.\*\*\*\*, Galdon, A.\*\*\*\*, Sánchez-Alvarez, J.C.\*\*\*\*, Pérez-García, M.\*.  
 \*University of Granada (Spain). \*\*University of North Carolina at Wilmintong, North Carolina (U.S.A.). \*\*\*Granada Diagnostic Center Inc. (Spain). \*\*\*\*Virgen de las Nieves Hospital of Granada (Spain).

Drug resistant temporal lobe epilepsy is a complex alteration that greatly affects the neuropsychological functions, psychosocial adaptation and quality of life of the patients who suffer from it. Neurosurgery, and specifically the temporal lobectomy, is an effective alternative treatment for controlling the seizures of some of these patients (Engel, 1987). Due to the pronounced relationship between the temporal lobe and the mnemonic functions, one of the important undertakings of Clinical Neuropsychology is the study of the effects of these surgical interventions on the patients' memory. Therefore, the purpose of this study is to examine any possible post-operative changes in long term memory for verbal material after the temporal lobectomy in a Spanish sample, by using both group and individual methodologies.

## Method.

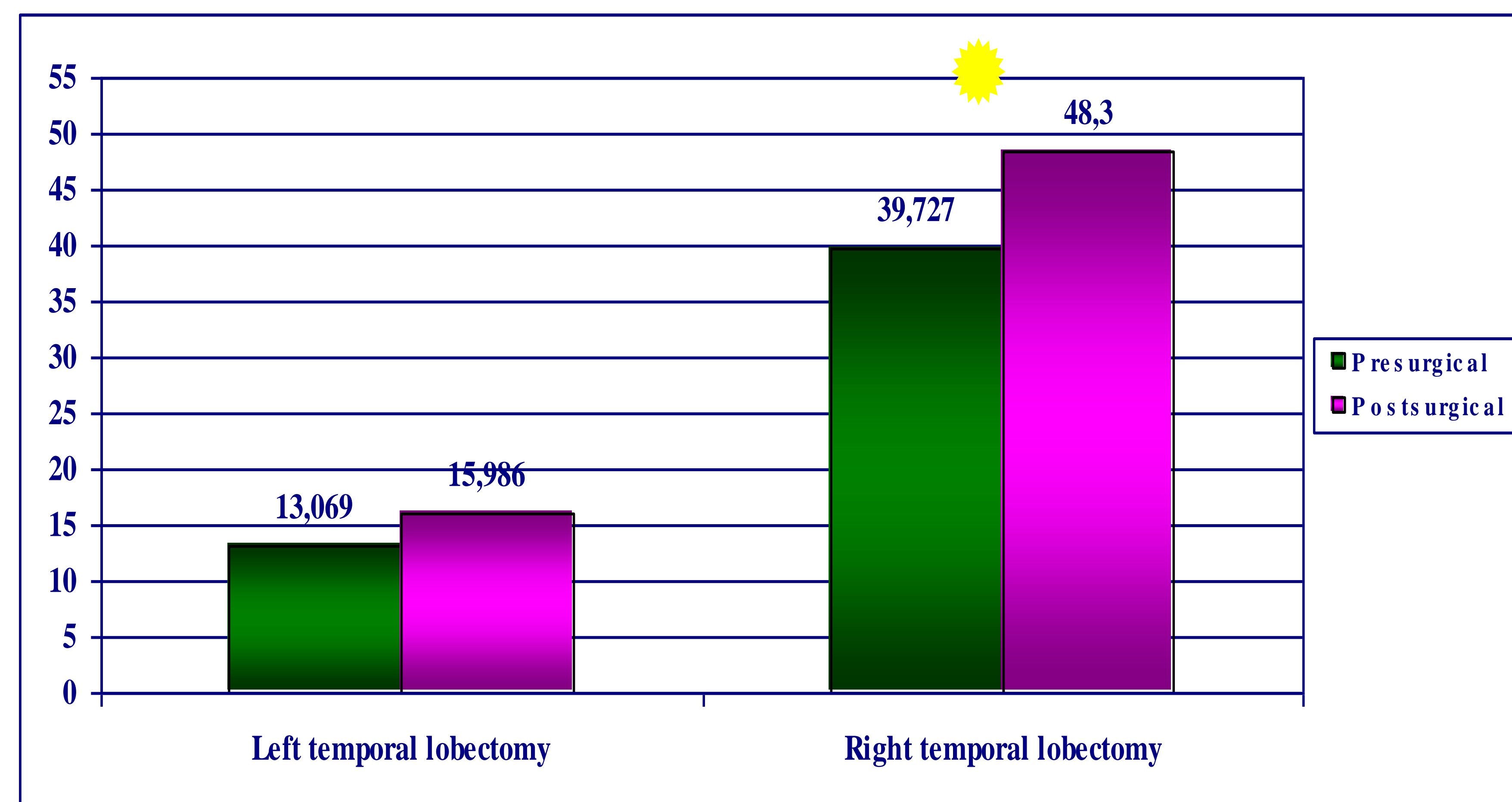
- **Subjet:** 27 patients with temporal lobe epilepsy with simple or complex partial seizures and with or without secondary generalization
- **Material:** Spain-Complutense Verbal Learning Test (Benedet & Alexandre, 1998). This is an episodic memory task for the verbal material. It is the Spanish version of the California Verbal Learning Test of the CVLT developed by Delis, Kramer, Kaplan & Ober in 1987.
- **Procedure:** Patients were evaluated presurgically and six month after the temporal lobectomy.
- **Variable:** T score for the Discriminability variable in recognition from the TAVEC. This variable is an index that provides information about the degree to which the patient discriminates the target words from the rest of the related and non-related words. It is obtained with the following formula:  $1 - \frac{(\text{False positives on recognition} + \text{omissions in recognition})}{44} \times 100$

## Results.

The total number of patients was divided into two groups according to the lateralization of the intervention, and the same group analyses were carried out for the variables of each group. Thus, the pre and post-operative variables of the patients who underwent a left temporal lobectomy will be compared on the one hand, while the variables of the patients who underwent a right temporal lobectomy will be compared on the other. The analyses to be used are the Student T, when the distribution is normal, and the paired Wilcoxon non-parametric analysis if the distribution of the variables is not normal. The frequency analyses are carried out in each variable with the objective of determining whether the clinically significant improvements and deteriorations (change equal to or greater than 1 SD (Hermann & Wyler, 1988)), as well as the absence of these changes, are more frequent depending on the lateralization of the intervention (left vs. right).

The analyses showed no statistically significant changes in the left temporal lobectomy group, but a statistically significant improvement in the right temporal lobectomy group [W(1,21) = 1.992;  $p = 0.046$ ]. The case analyses showed that the improvements or deteriorations were not more frequent in any group, but we observed some clinically significant deteriorations in the left group, and some improvements in both groups.

## T Student/Wilcoxon analyses of dicriminability in temporal lobectomy



## Frequency analyses of dicriminability improvement

Variable	Side of intervention	Improvement %	No Change %	<i>P</i> Fisher
Discriminability	Left Temporal Lobectomy	23.1	76.9	0.411
	Right Temporal Lobectomy	41.7	58.3	

## Frequency analyses of deterioration improvement

Variable	Side of intervention	Deterioration %	No change %	<i>p</i>
Discriminability	Left Temporal Lobectomy	15.4	84.6	0.480
	Right Temporal Lobectomy	0	100	

## Discusión

None of the analyses carried out on the left temporal lobectomy group, revealed the existence of statistically significant changes after the surgery. These results are inconsistent with many articles that report statistically significant deterioration in verbal memory after left temporal lobe surgery (Helmstaedter & Martin, 2001; Jones-Gotman, Zatorre, Olivier, Andermann, Cendes, Staunton, McMackin, Siegel, Wieser, 1997; Jokeit, Ebner, Holthausen, Marlowitsch, Moch, Pannek, Sculz, Tuxhorn, 1997; Hermann, Wyler, Somes, Dohan, Berry, Clement, 1994; Helmstaedter, Elger, 1996; Chelune, Naugle, Luders, Sedlak, Awad, 1993). There are various possible explanations for this lack of agreement between these articles. Fisrt, this lack of change could also be due to the effect of practice, as was proposed to explain the lack of change in the intelligence coefficient (Dodrill, Jones-Gotman, Loring, & Sass, 1993). Second, the fact that the majority of the patients in our sample presented mesial temporal sclerosis, and other types of similar findings and presurgical memory deficits, may have lessened the impact of the surgery on the memory. The group analysis revealed the existence of statistically significant improvements in right temporal lobectomy group. The post-operative improvement is therefore explained by the success of the surgery, which in most patients eliminates the epileptic seizures that would no longer spread to the contralateral hemisphere and would no longer produce these negative effects. Therefore, after a surgical intervention, the area with no structural damage observable with magnetic resonance becomes free of the harmful effects of the seizures. Secondly, if the seizures disappear, the doses and numbers of anti-epileptic drugs begin to be reduced, as there is no longer any reason to continue with a strong poly-therapy. Thus, almost all of our patients had their drug treatment reduced.

The comparison of the group analyses and the individual analyses reveal that the former are not sufficient to describe the post-operative changes, as they lose a lot of variability in the results. In our opinion, this is very important because in describing the changes they can lead to ignoring effects and relationships between variables that could potentially be important for developing predictive strategies based on the neuropsychological evaluation.

Finally, and in light of the results, we think future research should try to achieve two objectives. One of them is to carry out of this type of analyses with broader samples that would make it possible to broaden the categorization levels of the deterioration, as with two levels variability is lost (presence and absence of deterioration). The second objective is to continue to investigate other factors that may be influencing the results, such as the appropriateness, specificity and sensitivity of the neuropsychological tests used, as well as the existence of other variables unique to the patients themselves.

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