

# Holding on to Last Words? Aphasic word-repetitions may have psychological relevance



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## INTRODUCTION

- **Aphasia** refers to language deficits, typically, after left-hemisphere brain damage. Patients have problems either in converting their thought into language (i.e., expressing language) or in converting language into thought (i.e., understanding language). Any aspect of language may be disrupted in aphasia including naming objects, semantics, syntax, morphology, reading etc.
- Importantly, such patients frequently repeat a word or a phrase or a sentence (**verbal-perseveration**).
- They also mispronounce or (semantically) mis-use words. Sometimes they even coin and use new words (**neologism**).
- While it may seem that the word/phrase being repeated or invented is random it is not known if such words have any significance for the patient.
- **Hemineglect** is the neglect of left-sided space, body parts and mental representations, typically, after right-hemisphere brain damage.
- The patient may not perceive events that occur on left side, not make motor actions with left sided body parts, not recall mental representations that were spatially on the left side of the space being recalled. Sometimes patients may neglect or feel irritated by the person sitting on their neglected left side.
- **Right-sided neglect** following left-hemispherical damage is rare but has been recognized.

## CASE DESCRIPTION

The patient, R.C., is a 66-years-old man, with no previous neurological condition. His family noted increased 'forgetfulness' in him when he could not name some otherwise day-to-day objects. Neurological investigation revealed a tumor in his left-temporal lobe.

## CLINICAL COURSE

### Pre-operative Neuropsychological Assessment

- Mild language impairment was observed on tests for aphasia. He scored 79/82 on **GATA Aphasia Test (GAT-2)** due to points he lost on reading and following ambiguous commands.
- When asked to generate as many words as possible that start with specific letters (e.g., K and M), he generated 7 words starting with the letter K, and 9 words starting with letter M, showing moderate impairment. He could only generate 6 food-related words in one minute. However, he generated 16 animal names in a minute.
- He was severely impaired in tests of fluid intelligence. He scored 3/71 in block design part, and 4/30 in matrix reasoning part of **Wechsler Abbreviate Scale of Intelligence** battery.
- His visuo-spatial memory was also impaired. When asked to copy a complex figure from memory, he scored 6/36 in immediate recall (expected average score for his age 14/36) and 4/36 in delayed recall (expected average score 14/36).
- Neither him nor his wife nor his son reported any significant incapability in competencies of daily (tested by **Patient Competency Rating Test**).
- He showed no neglect. His **line-bisections** were in the expected middle (Figure 1).

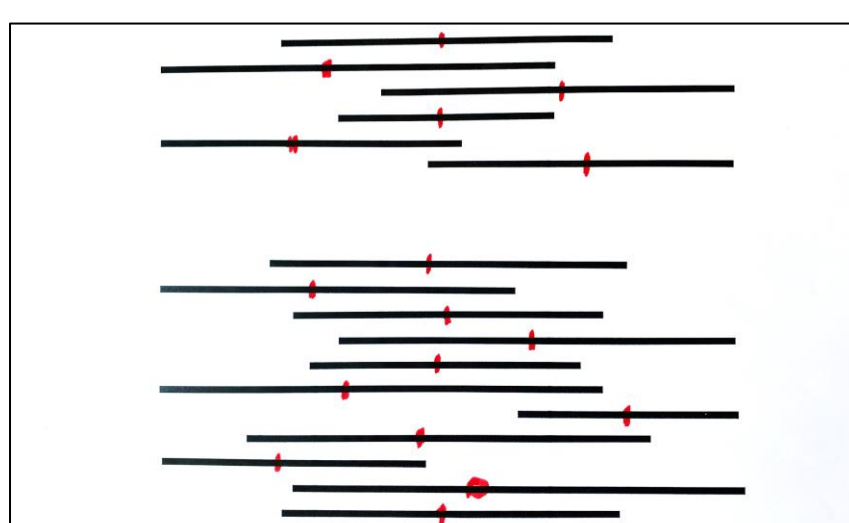


Figure 1. Pre-operative line bisection test. The patient successfully marked the midpoints of the lines (red marks were drawn by the patient).

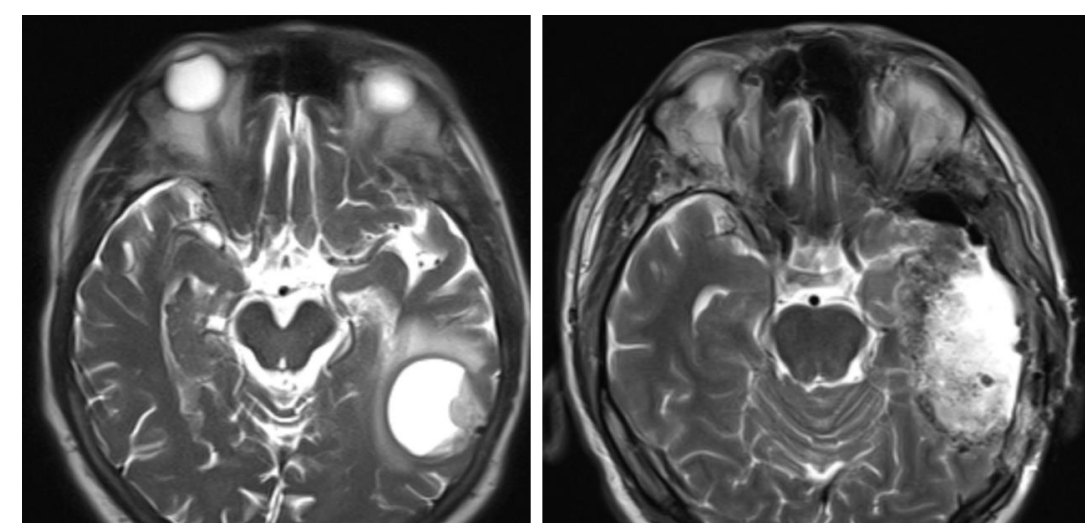


Figure 2. Pre-operative T2 weighted MR image on the left shows the tumor on the left temporal lobe. Post-operative T2 weighted MR image on the right shows the resected area.

## Surgery

Left temporal lobectomy excluding the hippocampus was performed. Pre-operative and post-operative scans show the tumor and the resected area (Figure 2).

### Post-operative Neuropsychological Assessment

After surgery, all major language abilities such as comprehension, reading, fluently speaking and writing were severely damaged to the extent that he was unable to communicate. He was also very poor in taking verbal and written commands. Hence, he could not be neuropsychologically assessed in detail.

Crucially, he perseverated on a single word and used it instead of almost every other word while speaking. He used new and non-existent words that were very evidently derived from this word. The word he perseverated and used constantly for almost everything he wanted to say was **öğren** (to learn) (Figure 3). For instance, when he was asked to tell the name of the examiner, the name of an old friend of him or name of objects (e.g., a water bottle), he used the word **öğren** instead of the name of the person or the object.

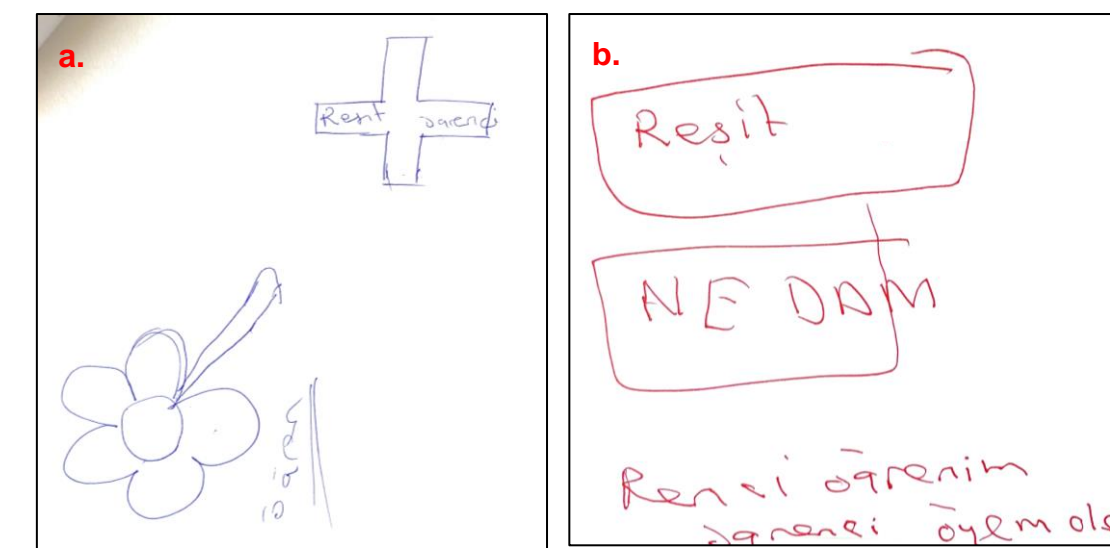


Figure 3. Perseveration of the patient with the word öğren. When he was asked to copy the shapes, he, instead, wrote öğren and öğrencisi to the edge of the shapes (a). When asked to write his name and surname or some random sentences, he wrote words derived from the word öğren as öğrenim and öğrencisi (b).

He also showed **right sided hemineglect**. He was neglecting the right side of the paper when asked to read a text, to write something or to perform some calculations or draw some shapes on the paper. He didn't recognize the shapes or calculation operations on the right side of the paper unless the ones on the left were covered by the examiner (after that, he was able to perceive the ones on the right side with the examiner's pointing). His line-bisections were significantly shifted to the left side (Figure 4).

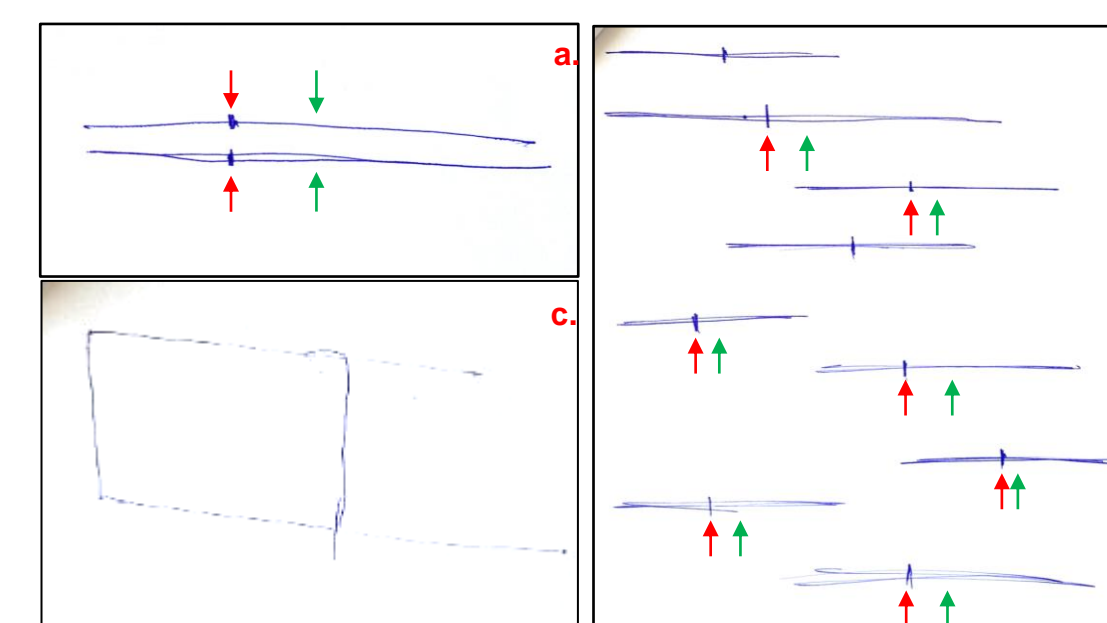


Figure 4. Post-operative line bisections of the patient. Significant shifts toward the left side while marking the midlines can be seen. Red marks were drawn by the patient, green marks are the actual midlines (a and b). When asked to mark the midline of the two horizontal lines, he completed the lines to a rectangle by excluding the right side. The excluded part of the rectangle on the right side can be seen (c).

He was also found to neglect people on his right side. When the examiners spoke from his right side, the patient could not perceive them and take commands unless the examiners switched to the left side of his visual field.

## DISCUSSION

The family reported that, just before the operation, they had explained the risks of the surgery to the patient. They had emphasized that he may lose his language abilities.

They had motivated the patient by saying that they will learn (**öğren**) together and recover the impaired functions again.

This likely made the word öğren not only very relevant but also emotionally salient to the patient.

Before the operation, the patient may have clung to the idea that even if there is a risk of forgetting and losing language functions, there is only one thing to hold on to and that is that he will learn again, that he must learn.

Therefore, to learn again may have become the most salient thing that remained in his memory.

**The case suggests that perseverations and neologisms in aphasia may have deep psychological relevance to the patient.**

**This case shows that right-sided hemineglect can occur after left temporal lobectomy.**