Word-centered left pure hemi-alexia: a case report

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Background

- Pure alexia, or alexia without agraphia, is a rare, acquired reading disorder typically associated with left occipitotemporal lesions [1].
- A variant limited to the left visual field is described after splenial lesions [2].
- We report a case of left pure hemi-alexia in a 63-year-old patient after surgical resection of a meningioma, resulting in right inferior quadrantanopia.

Neuropsychological assessment

- The patient showed markedly slow reading, hesitations (particularly at the beginning of words), and reading errors such as omissions, substitutions, and completions of initial letters, even when words were vertically oriented.

Word target	Reading
terreno	sereno
coscienza	scienza
tetto	petto
volare	solare

Non-word target	Reading
qualerco	anerco
carra	serra
gartino	artino
gilvane	silvane

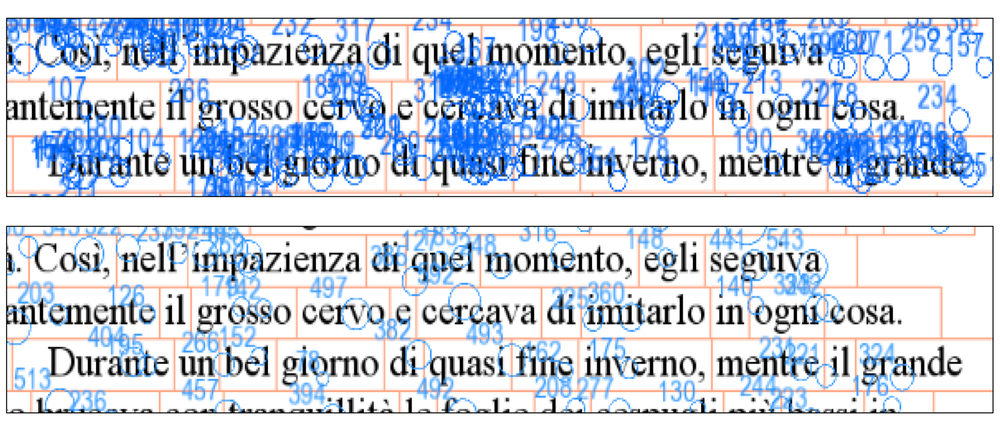
- Long words were read more accurately than short ones, and non-words were frequently misread as real words based on their endings.

Word and non-word reading errors	35 days after surgery		55 days after surgery		5 months after surgery	
	Words	Non-words	Words	Non-words	Words	Non-words
Total errors	33%	42%	27%	80%	27%	56%
Left-sided errors/total errors	83%	84%	80%	75%	96%	100%
of which insertions	0%	13%	0%	7%	8%	4%
of which replacements	76%	69%	80%	44%	54%	68%
of which omissions	12%	19%	15%	37%	29%	24%

- Letter recognition was impaired, particularly for letter pairs or triplets, but the patient correctly identified them after copying.
- The other cognitive domains were preserved.

Eye movements during text reading

- Increased number of fixations per word (> 3)
- Normal single fixation duration (≅ 230 ms)
- Increased number of within-word, but not between-word, regressions
- Normal overall regression rate (≅ 9%)
- Increased dwell time (≅ 850 ms)



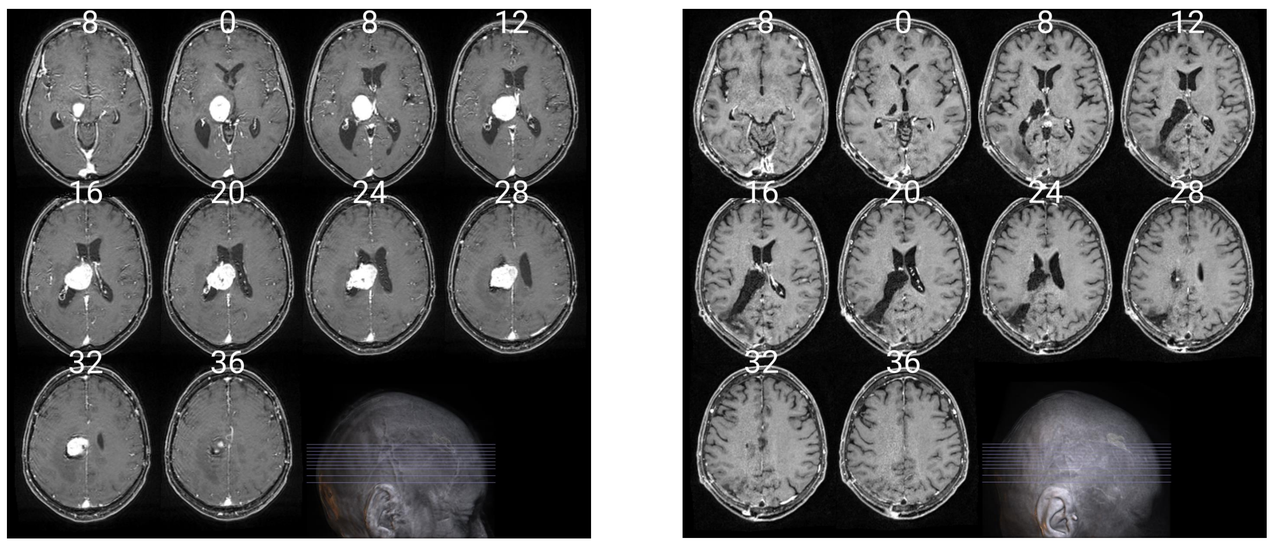
Eye movement pattern of the patient (top) compared to a normal reading pattern (bottom). The patient reads through many small rightward saccades, with few regressions.

Conclusions

- Left hemifield reading deficits are traditionally linked to inter-hemispheric disconnection between right visual and left language areas.
- In our case, however, the deficit was word-centered and occurred also during natural reading.
- We propose that a combination of inter-hemispheric disconnection and dysfunctional oculomotor strategies underlies this impairment. Integrating eye movement training into rehabilitation may enhance residual reading mechanisms, improving reading performance.

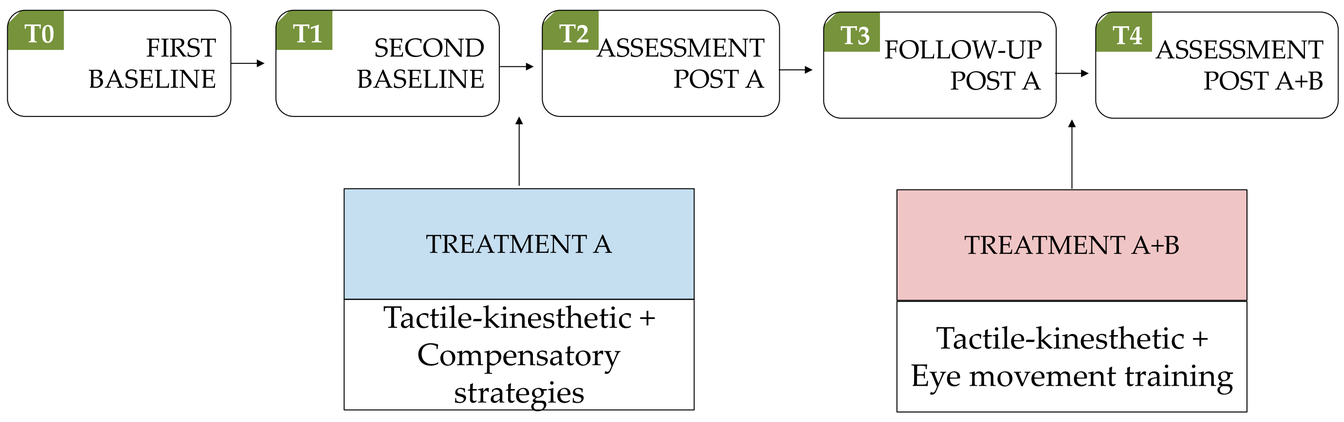
Lesion analysis

- Before surgery:
  left intraventricular meningioma extending to the left thalamus, optic radiations, and splenium.
- After surgery:
  left occipitotemporal lesion, encroaching the inferior longitudinal and fronto-occipital fasciculi.

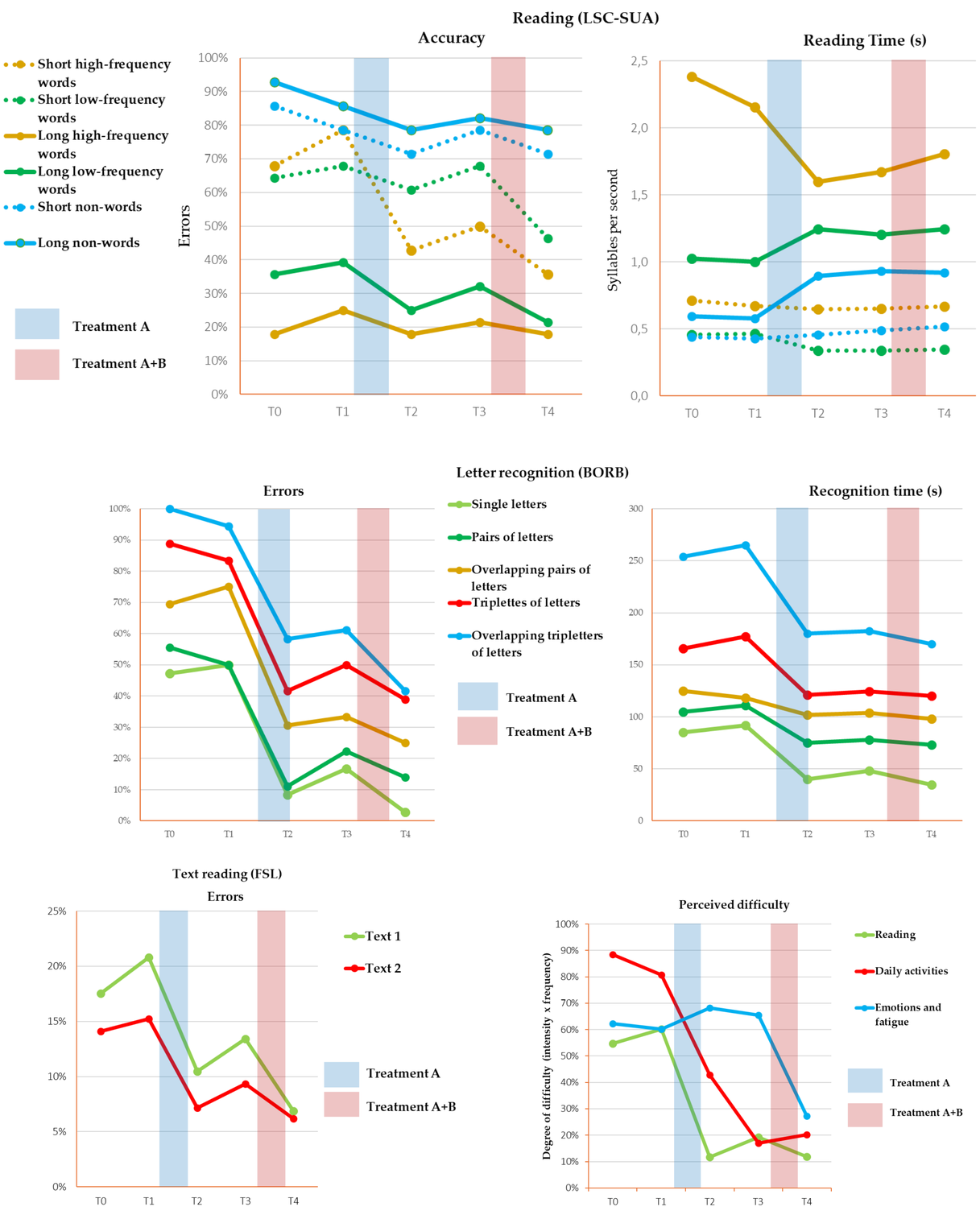


Images in MNI space. Disconnection analysis conducted following [3].

Rehabilitation protocol



- The combined rehabilitation strategy significantly improved word and text reading accuracy, with smaller effects on non-words.
- Letter recognition (BORB) already improved after treatment A and further improved after treatment A+B.



References

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