

“Lexical Alexia” in a Chinese Semantic Dementia Patient

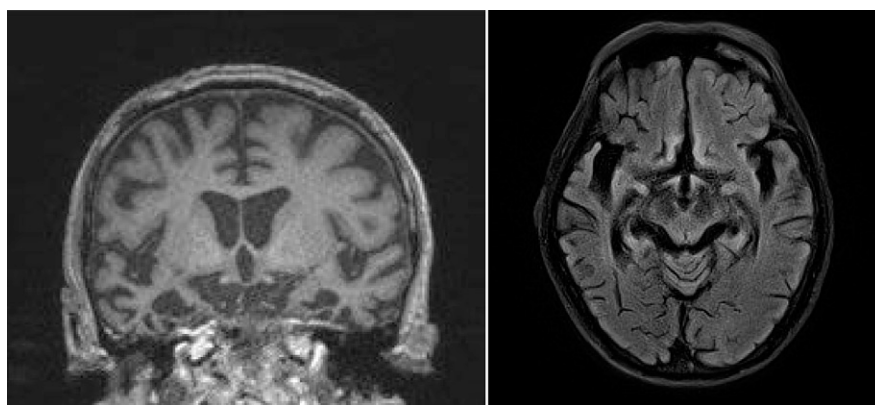
To the Editor: Semantic dementia (SD) is characterized by impaired ability in understanding the meaning of words, anomia, and surface dyslexia, but spared speech production.¹ Neuroimaging typically shows anterior temporal lobe atrophy and hypometabolism in functional imaging.^{2,3} New diagnostic criteria have been proposed by Gorno-Tempini ML et al. in 2011, which incorporated the clinical and radiological characteristics of SD.⁴

Reading disorder in SD is characterized by surface dyslexia, or “regularization” error.⁵ Patients typically have difficulty in reading irregular words, and tend to “regularize” them. This suggests that the phonological pathway is intact for reading in SD patients (example: “sew” will be read as “sue”). However, the reading disorder to date is largely described in English-speaking patients, but there are limited reports and understanding about the reading disorder as seen in Chinese-speaking patients. In this case report, we describe reading disorder seen in a case of a Chinese SD patient.

Case Report

A 65-year-old Chinese Singaporean gentleman presented to Singapore General Hospital with complaint of cognitive impairment for the past 4 to 5 years. He started with difficulty in understanding words during conversation, difficulty in reading Chinese words, and expressing himself. He has completely lost the ability to read and write Chinese characters for the past 2 years. He was noted to

FIGURE 1. MRI T1 (left) and FLAIR (right) Images Showing Bilateral Anterior Temporal Atrophy, Right > Left



have difficulty in recognizing friends and relatives, despite being prompt. He was also found to be forgetful, more quiet, withdrawn, and less sociable. He completed 6 years of education in Chinese “stream” school, and was competent in reading and writing Chinese. He was also strongly interested in local politics, and frequent discussions were common before onset of the illness.

Bedside language exam showed fluent speech, with no evidence of agrammatism or motor speech disorder. He was only able to name 5 out of 15 items in the modified Boston Naming Test. He named “dog” for “camel.” He was also not able to comprehend the meaning of “comb,” “scissors,” “camel,” “abacus,” “seahorse,” and “wheelchair” from the Boston Naming Test when asked in the latter part of the interview. He generated five animals in 1 minute in the Verbal Fluency Test. When shown 48 common Chinese characters chosen from Basic Vocabulary Table of Modern Chinese Characters (Chinese State Language Work Committee, 1988),⁶ he failed to recognize or read any, including

common, high-frequency words such as ‘虫’(worm) and ‘衣’(cloth). When shown local prominent politicians’ or celebrities’ pictures, such as Mr. Lee Kuan Yew and Ms. Stephanie Sun, he was not able to recognize them, but he was able to match photos that were taken from different angles and differentiate them from the other pictures. Brain MRI (Figure 1) showed significant bilateral anterior temporal atrophy, right more than left.

Discussion

This patient showed typical clinical characteristic of SD, with impairment of confrontational naming and difficulty in word comprehension. He also showed evidence of “associative” prosopagnosia,⁷ characterized by losing personal general knowledge but intact facial encoding process. Brain MRI was also consistent with changes seen in SD. The patient fulfilled recent proposed criteria for diagnosis of Semantic Dementia.⁴

In surface dyslexia, which is characterized by over-reliance on phonological response to orthographical correspondences, patients

usually show impaired ability to translate irregular orthography to phonology. This is frequently reported in SD patients with an English-speaking background. This is possibly due to SD patients' loss of the semantic knowledge of visual orthographical or lexical representation of words at the visual ventral pathway, caused by temporal lobe dysfunction,⁸ and thus, reliance on the phonological responses via the visual-dorsal pathway. Previous reports suggested that the Chinese version of "surface dyslexia" could be observed in Chinese-speaking SD patients.^{9–11} The Chinese language is an ideographical, nonphonetic language; it does not have the grapheme–phoneme correspondence (GPC) seen in alphabetic language. In Chinese, each character is formed by radicals and components, with an independent semantic meaning. Reading disorder reported in Chinese SD patients is characterized by the tendency to read only the component or radical, rather than the whole word. This was described as the Chinese version of surface dyslexia.^{9–11} Our patient is characterized by complete loss of his ability to read or recognize any Chinese characters, including the common, low-stroke, high-frequency words. Those words are common components seen in other, higher-stroke Chinese characters. Our SD patient model supports Chinese language as a language that does not support

grapheme–phoneme correspondence, in keeping with recent findings that orthography in Chinese is more important in accessing semantics than is phonology,^{12,13} and phonology-processing in Chinese is distinctive when compared with alphabetic language.¹⁴

Thus, this suggests that "surface dyslexia" is not an appropriate term to describe reading disorder in Chinese SD patients, as there is no GPC involvement in Chinese reading. Direct translation or application of the linguistic model from alphabetic language into Chinese language has a limited role in these circumstances. We suggest that, probably, "lexical alexia," is more appropriate in this clinical context.

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