Thalamic semantic paralexia

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Abstract

Alexia may be divided into different subtypes, with semantic paralexia being particularly rare. A 57 year old woman with a discreet left thalamic stroke and semantic paralexia is described. Language evaluation with the Boston Diagnostic Aphasia Battery confirmed the semantic paralexia (deep alexia). Multimodality magnetic resonance imaging brain scanning excluded other cerebral lesions. A good recovery ensued.

Introduction

The acquired alexias may be categorized into posterior, anterior, central and deep alexias. Analogous to semantic paraphasias, semantic paralexias constitute the substitution of content related words during reading. Unlike the analogous subcortical aphasias such as thalamic aphasia, subcortical syndromes of alexia have rarely been described. This report depicts a patient with thalamic alexia with features of deep alexia (or paralexia), the latter which has not been described after review of the English based literature.

Case Report

Index patient

A 57 year old white, right handed, English speaking woman with 13 years of education, presented to our stroke center with mild right sided numbness and weakness (graded 4-5 Medical Research Council grading scale) with the family reporting transient confusing conversation and speech difficulty. The clinical evaluation at our center encompasses a cognitive screening evaluation in all patients followed by psychiatric assessment in selected patients described in detail elsewhere. No dysnomia was documented. Specifically visual acuity and visual fields were normal and there was no object agnosia, dyschromatopsia, dyscalculia, finger agnosia, right left disorientation, or hemineglect syndrome. The substitution of semantically related words was documented with only mild slowing in her reading (family corroboration). Cerebrovascular risk factors included a significant smoking history and on investigation hyperhomocysteinemia (15.6 mmol/L). Within 4 days, the reading difficulty had normalized but she remained with mild speech dysfluency, right hand ideomotor apraxia and developed a Dejerine Roussey or post stroke thalamic pain syndrome.

Neuroimaging

Multimodality magnetic resonance imaging Investigations revealed a left lateral posterior thalamic infarct, well circumscribed on T2 weighted and diffusion weighted imaging without other brain parenchymal lesion (Figure 1). Magnetic resonance angiography revealed a left internal carotid artery stenosis graded 50-74% and basilar artery fenestration.

Cognitive testing

In view of the isolated reading impairment, additional psychometric examination was performed on day 3 after the stroke onset, with The Boston Diagnostic Aphasia Examination (Third Edition - short form). In addition, the test for semantic paralexia prone words were tested with the standard version of the Boston Diagnostic Aphasia Examination (version III) (Table 1). In comparison to normative data, notable deficiencies were noted only in speech fluency, articulation, oral word and sentence reading, picture word matching and writing.

Discussion

The commonly referred to syndromic classification of Benson and Geschwind of posterior alexia (alexia without agraphia), central alexia (alexia with agraphia), anterior alexia (alexia in association with expressive dysphasia) and deep dyslexia (primarily semantic paralexia disorder) aptly describes most acquired reading deficiencies. Alexia secondary to isolated thalamic lesion has not been reported other than in combination with left occipital lesions, the latter lesions the usual focus. Semantic paralexia due to thalamic lesions has not been reported previously with neuroanatomical lesions mostly referred to as large perisylvian and even right hemisphere lesions implicated. Similar to subcortical aphasias, the subcortical (thalamic) alexia reported here is characterized by atypical alexia syndrome components. These include relatively mild deficit, transience, a mixture of syndromic components with rapid recovery. The lack of hemispheric lesions on magnetic resonance imaging using standard T2 weighted images diffusion weighted imaging for infarct exclusion, fluid attenuation inversion recovery sequences for covert white matter lesions and gradient echo sequences to exclude minor hemorrhagic lesions, implicated the thalamic lesion alone as the critical lesion in the syndrome described. Although not a routine stroke investigative tool, functional magnetic imaging (f-MRI) would have been an important additional neuroimaging modality to

Table 1. Boston diagnostic aphasia test - version III.

| Subtests                                      | % |
|----------------------------------------------|---|
| Fluency                                      |   |
| Phrase length                                | 30 |
| Melodic line                                 | 60 |
| Grammatical form                             | 70 |
| Conversation expository speech               | 100 |
| Auditory comprehension                       |   |
| Basic word discrimination                    | 100 |
| Commands                                     | 100 |
| Complex ideational material                  | 100 |
| Articulation (agility)                       | 70 |
| Recitation (automatized sequences)           | 100 |
| Repetition Words                             | 60 |
| Sentences                                    | 100 |
| Naming                                       |   |
| Responsive naming                            | 100 |
| Boston naming test                           | 100 |
| Special categories                           | 100 |
| Paraphasia                                   | 100 |
| Reading                                      |   |
| Matching case and scripts                    | 100 |
| Number matching                              | 100 |
| Picture word matching                        | 40 |
| Oral word reading                            | 40 |
| Oral sentence reading                        | 60 |
| Oral sentence comprehension                  | 100 |
| Sentence/paragraph                           | 100 |
| Comprehension                                | 100 |
| Writing                                      |   |
| Form                                         | 20 |
| Letter choice                                | 40 |
| Motor facility                               | 40 |
assess whether the right hemisphere had or had not played a role. However, the rapidity of recovery precluded functional magnetic imaging, that may have helped ascertain whether right hemisphere linguistic processing was operative, the contemporary hypothesis of semantic paralexia.14

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Figure 1. Left thalamic infarct depicted on diffusion weighted and T2 weighted magnetic resonance scan (arrows).