

Memory dysfunction in caudate infarction caused by Heubner's recurring artery occlusion

Hideko Mizuta ^a, Naoyasu Motomura ^{b,*}

^a Department of Rehabilitation, Itami Municipal Hospital, Japan

^b National Mental Support Center for School Crisis, Osaka University of Education, Midorigaoka, Ikeda City, Osaka 5630026, Japan

Accepted 16 November 2005

Available online 28 February 2006

Abstract

We report five cases with caudate infarction due to Heubner's recurring artery occlusion, in which we conducted detailed memory examinations in terms of explicit memory and implicit memory. We performed the auditory verbal learning test as explicit memory tasks, and motor and cognitive procedural memory tasks, developed by Komori, as implicit memory tasks. Comparing normal control subjects with patients with left caudate infarction due to Heubner's recurring artery occlusion demonstrated lower scores on both declarative and motor procedural memory tasks. These results suggest that the left caudate nucleus may be related with both declarative memory and procedural memory.

© 2005 Elsevier Inc. All rights reserved.

Keywords: Caudate nucleus; Heubner's recurring artery occlusion; Explicit memory; Implicit memory

1. Introduction

Memory is not a unitary process. One important differentiation is the procedural and declarative memory (Squire, 1987). These two components of memory are now generally accepted as separable modules that may selectively be impaired by brain damage. The neural basis for declarative memory is thought to be the hippocampus, the basal forebrain and the thalamus etc. The cerebellum and the basal ganglia etc. are believed to be the neural basis for procedural memory.

In terms of the caudate nucleus, animal studies have suggested that caudate nuclei are essential for cognitive functions. Rosevold and Delgado (1956) reported that electrical stimulation of the caudate nucleus demonstrated a declarative memory disturbance. More recently, De Coteau, Hoang, Huff, Stone, and Kesner (2004) reported

that damage to the medial caudate nucleus results in short-term memory for directional information.

Few studies of clinical cases with caudate stroke have been previously reported. Stein et al. (1984) reported transient verbal declarative memory disturbance in six cases out of 12 caudate stroke cases. Caplan et al. (1990) reported two cases with memory disturbances out of 18 caudate infarction cases. Both cases presented with a left-sided lesion, however, the feature of memory disturbances were unclear. Fukamachi, Horikoshi, Nagasaki, Sasaki, and Nukui (1987) reported three cases with caudate region. One of these cases demonstrated Korsakoff syndrome with amnesia, confabulation, and disorientation. However, another two cases demonstrated no behavioral abnormalities. Mendez, Adams, and Lewandowski (1989) showed that 12 patients with caudate nuclei lesions developed an acute behavioral change characterized by apathy, disinhibition or major affective disturbances. Neuropsychological testing on seven patients with unilateral caudate-lesions demonstrated a consistent pattern of cognitive deficits in executive functions, memory, and attention. Memory disturbances were characterized by verbal declarative memory

* Corresponding author. Fax: +81 72 752 9904.

E-mail address: motomura@cc.osaka-kyoiku.ac.jp (N. Motomura).

disturbance. Kumral, Evyapan, and Balkir (1999) observed eight out of 31 patients with acute caudate vascular lesion with memory disturbances. The auditory verbal learning test for verbal memory and the Benton visual retention test were performed for visual memory. Three verbal amnesia in the left-sided lesion, four visual amnesia in the right-sided lesion, and one verbal and visual amnesia in the left-sided lesion were reported. These reports, in combination with the caudate stroke cases indicate that the caudate nucleus is related to a declarative memory process.

In contrast with stroke cases, neurodegenerative cases including patients with Huntington's disease (Butters, Wolfe, Martone, Granholm, & Cermak, 1985) who show pathological caudate nucleus damage, demonstrate both procedural memory and declarative memory disturbances. We believe that several gaps in the feature of memory disturbances in stroke patients and neurodegenerative diseases exist. We have hypothesized that both procedural and declarative memory is disturbed in caudate damaged stroke cases. Therefore, we conducted a detailed memory test for patients with caudate infarctions to elucidate whether the caudate nucleus is related to both declarative memory and procedural memory processes.

Three major vascular areas supply the head of the caudate nucleus, i.e., Heubner's artery, the anterior lenticulostriate arteries, which originates from the proximal section of the anterior cerebral artery, and the lateral lenticulostriate arteries, which originates from the middle cerebral artery. Herein, we examined a number of patients with caudate stroke by Heubner's recurring artery, which was detected by neurosurgeons.

2. Subjects

Subjects consisted of five patients presenting lesions, due to rupture and repair of an aneurysm within the anterior communicating artery. Three out of five patients presented with left-sided lesions (Group L) and the two remaining patients presented with right-sided lesions (Group R). Furthermore, three patients with a ruptured aneurysm without vasospasm served as the control group (Group C). These three groups were matched according to level of education experienced. The L group contained patients who were older. The sexual ratio was variable in the present study. All patients were right handed (Table 1).

Table 1
Subjects

Cases	Sex	Age	Education
L-1	m	61	6
L-2	f	49	9
L-3	m	70	10
R-1	f	39	12
R-2	f	51	9
S-1	m	61	12
S-2	f	39	12
S-3	f	64	10

3. Case reports

3.1. (1) Group L

L-1 is a 61-year-old right-handed man with 6 years education. Following a severe headache, he was admitted to a local hospital. On admission, consciousness was clear with no neurological signs present. A CT scan revealed blood in the subarachnoid, and a carotid angiography revealed an anterior communicating artery aneurysm. The following day, the neck of the anterior communicating artery aneurysm was clipped. Neurosurgeons confirmed vasospasm of the left Heubner's recurrent artery during surgery. The patient became abulic following surgery, however, this gradually improved. One month following surgery, the patient was able to return to work and resumed his gardening job satisfactorily.

L-2 is a 49-year-old right-handed housewife, and a bar manager with 9 years education. Following a severe headache, the patient was admitted to a local hospital. The following day, the headache recurred and the patient became comatose. An angiography revealed an aneurysm rupture. The neck of the anterior communicating artery aneurysm was subsequently clipped, the same day. Neurosurgeons confirmed vasospasm of the left Heubner's recurrent artery during surgery. Five months following onset, the patient returned home and was able to resume household duties.

L-3 is a 70-year-old right-handed man, the manager of an art gallery with 10 years education. Following a brief loss of consciousness, the patient was taken to hospital. On arrival at a local hospital, no focal neurological findings were evident. A CT scan revealed blood in the subarachnoid and a carotid angiography revealed an anterior communicating artery aneurysm. On the same day, the neck of the anterior communicating artery aneurysm was clipped. Neurosurgeons confirmed vasospasm of the left Heubner's recurrent artery during surgery. Postoperatively, the patient remained drowsy and abulic, however, began to improve following V-P shunt surgery. Seven months post onset, he returned home and was able to perform his job satisfactorily.

3.2. (2) Group R

R-1 is a 39-year-old right-handed housewife and assists with her husband's shop with 12 years education. The patient was admitted to a local hospital following severe headache and vomiting. On admission, the patient was conscious and no neurological signs were present. A CT scan revealed blood in the subarachnoid and a carotid angiography revealed an anterior communicating artery aneurysm. The same day, the neck of the anterior communicating artery aneurysm was clipped. Neurosurgeons confirmed vasospasm of the right Heubner's recurrent artery during surgery. The patient was abulic following surgery, however, abulic symptoms improved after a few days.

Download English Version:

<https://daneshyari.com/en/article/925187>

Download Persian Version:

<https://daneshyari.com/article/925187>

[Daneshyari.com](https://daneshyari.com)