



Amnesia due to Bilateral Fornix Infarction *Bilateral Forniks Enfarktına Bağlı Amnezi*

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Anahtar Kelimeler: Amnezi, difüzyon ağırlıklı manyetik rezonans görüntüleme, etiyoloji, iki taraflı forniks enfarktı, iskemik inme, subkallozal arter

Dear Editor,

Ischemic stroke often presents with muscle weakness, sensory disturbance, and impaired consciousness, but rarely presents with amnesia. This condition corresponds to sudden, unexpected, and short-term memory loss in which consciousness and awareness are preserved (1). The fornix is an important path in the Papez circuit. It plays an important role in human memory by binding the hippocampus to the anterior thalamus and the septal nucleus to the mammillary body (2). Amnesia due to fornix damage is reported rarely in case presentations (3). A patient with bilateral infarction of fornix who presented with amnesia is reported in this article.

A woman aged 75 years was admitted to the emergency service with difficulty in recognizing people, asking questions about the past, irritability, and repetitive speech, which were noticed by her relatives since she woke up in the morning. She had a 3-year history of hypertension and a 5-year history of diabetes mellitus type 2. Her neurologic examination was normal except for the loss in immediate and short-term memory. Total blood count and thyroid function tests were normal. The urea level was 55 mg/dL (normal range, 17-43 mg/dL) and creatinine was 1.2 mg/dL (normal range, 0.66-1.09 mg/dL), which were borderline high. Brain computed tomography (CT) results were normal. Diffusion-weighted

cranial magnetic resonance imaging (MRI) showed bilateral fornix infarction (Figure 1a, 1b). Electrocardiography showed normal sinus rhythm. Ejection fraction was 60% and chambers of the hearth were normal in the transthoracic echocardiogram. Carotid and vertebral artery Doppler ultrasonography showed atheromatous plaques that did not cause narrowing of the right internal carotid artery (ICA), but 60% narrowing of the left ICA (cerebral angiography could not be performed because the patient refused the examination). Clopidogrel was added to treatment for secondary prophylaxis. Amnesia improved at discharge (after 6 days stay in hospital), and still persisted at the first month follow-up, although there was more improvement.

There are two types of amnesia: retrograde and anterograde (4). Patients with amnesia often exhibit stereotypical behaviors and ask the same questions repeatedly. It is often seen in patients aged over 50 years and it can last a few hours, weeks or years. Vascular, ischemic, migrainous, and epileptogenic causes are considered as etiologic factors but often no cause can be found. Attention, visual spatial functions, and memory and retrieval function are preserved (5). It is known that amnesia can develop due to fornix impairment caused by various factors (hemangioma, cysts, tumors, focal encephalitis, epilepsy surgery) (3). The mechanisms of amnesia due to fornix impairment are not known well, but the impairment of cholinergic fibers is thought to be the underlying cause. The

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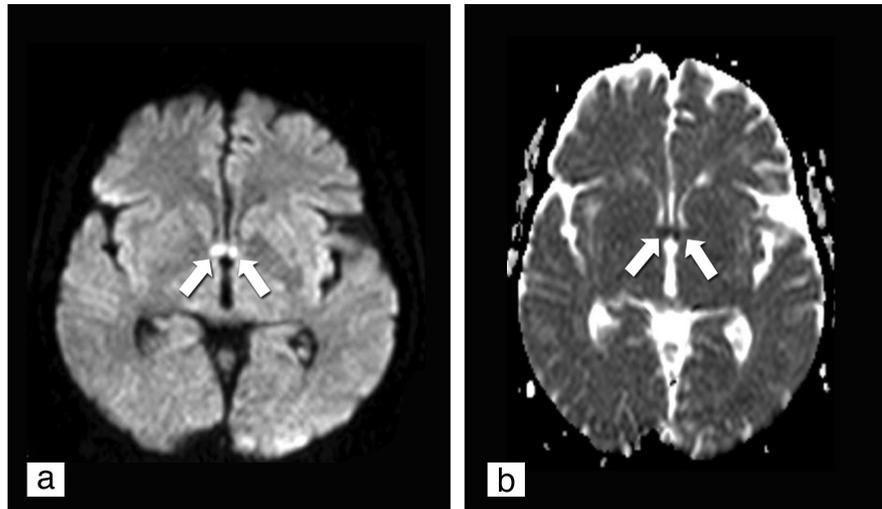


Figure 1. a) Increased signal intensities in B1000 series in axial diffusion-weighted magnetic resonance imaging suggesting acute infarction, b) Decreased signal intensities in apparent diffusion coefficient series in axial diffusion-weighted magnetic resonance imaging suggesting acute infarction

fornix derives its blood supply mainly from branches of the anterior communicating artery (subcallosal artery and lateral posterior choroidal artery). Bilateral fornix infarction can be seen in patients with a single or dominant subcallosal artery (5). Thus, bilateral fornix infarction is rarely reported, only in case presentations.

In patients who present with amnesia, diffusion-weighted cranial MRI should be performed instead of brain CT to exclude acute ischemic infarction. Especially in patients with bilateral fornix infarction, intracranial and cervical angiography should be performed to show the single or dominant subcallosal artery.

Ethics

Informed Consent: Consent form was filled out by participant.
Peer-review: Internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: İ.S., Concept: Ç.K.A., İ.S., Design: Ç.K.A., Data Collection or Processing: Ç.K.A., İ.S., Analysis or Interpretation: Ç.K.A., İ.S., Literature Search: Ç.K.A., İ.S., Writing: Ç.K.A.

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References

1. Mugikura S, Kikuchi H, Fujii T, Murata T, Takase K, Mori E, Marinković S, Takahashi S. MR imaging of subcallosal artery infarct causing amnesia after surgery for anterior communicating artery aneurysm. *AJNR Am J Neuroradiol* 2014;35:2293-2301.
2. Yasuno E, Hirata M, Takimoto H, Taniguchi M, Nakagawa Y, Ikejiri Y, Nishikawa T, Shinozaki K, Tanabe H, Sugita Y, Takeda M. Retrograde temporal order amnesia resulting from damage to the fornix. *J Neurol Neurosurg Psychiatry* 1999;67:102-105.
3. Moudgil SS, Azzouz M, Al-Azzaz A, Haut M, Gutmann L. Amnesia due to Fornix Infarction. *Stroke* 2000;31:1418-1419.
4. Markowitsch HJ, Staniloiu A. Amnesic disorders. *Lancet* 2012;380:1429-1440.
5. Bartsch T, Deuschl G. Transient global amnesia: functional anatomy and clinical implications. *Lancet* 2010;9:205-214.