

Case report

Transient global amnesia heralding basilar artery thrombosis

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Abstract

The cause of transient global amnesia (TGA) remains controversial. Focal cerebral ischemia, seizure, venous congestion, and migraine have all been proposed as underlying mechanisms. We describe a patient presenting with typical TGA who two days later developed a posterior circulation stroke due to basilar artery occlusion. He was treated successfully with intra-arterial thrombolytic therapy. Shortly thereafter, he had recurrent basilar artery thrombosis and jugular vein thrombosis, and was found to have a mucinous adenocarcinoma believed to be causing a hypercoagulable state. We believe this case supports the hypothesis that TGA can on occasion be caused by cerebral ischemia.

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1. Introduction

Transient global amnesia (TGA) is a characteristic clinical syndrome consisting of sudden isolated anterograde memory dysfunction with complete recovery generally occurring over hours [1]. Focal cerebral ischemia, seizure, venous congestion, migrainous phenomena (spreading cortical depression), and even psychological disturbances have been proposed as causes of TGA, but scant evidence exists to support any of these mechanisms. In the vast majority of cases, TGA is benign and diagnostic testing unrevealing. Indeed, what sort of diagnostic testing, if any, patients should receive is controversial, with some authors recommending that patients with a typical presentation do not require extensive investigation [2]. We report a case of typical TGA followed two days later by basilar artery thrombosis. This case emphasizes that TGA may not be a reliably benign entity, and that focal cerebral ischemia may in some cases be responsible for the clinical syndrome.

2. Case report

A 50-year-old Japanese–American man with no significant past medical history had abrupt memory dysfunction while watching television with his wife. Despite being told several times, he was unable to recall the day of the week. He repeatedly asked about activities he had done and planned for that day, but could not remember these activities even after writing them down and reading them several times.

On examination in the emergency room, he was completely awake and alert. He had marked anterograde memory loss. He was able to immediately repeat three words, but could recall zero out of three at 3 min. He repeated the same queries multiple times. Detailed neurological examination was otherwise entirely normal. His symptoms had resolved completely by the next day.

Brain MRI diffusion weighted imaging (DWI) obtained 48 h after symptom onset showed a small acute right superior cerebellar artery (SCA) territory infarction (Fig. 1A). MRA of the intracranial vessels was normal (Fig. 1B). Four hours after this MRI, he developed sudden perioral numbness and mild dysarthria. This progressed over the next 12 h to severe dysarthria, right facial droop, and right-sided ataxia. Urgent

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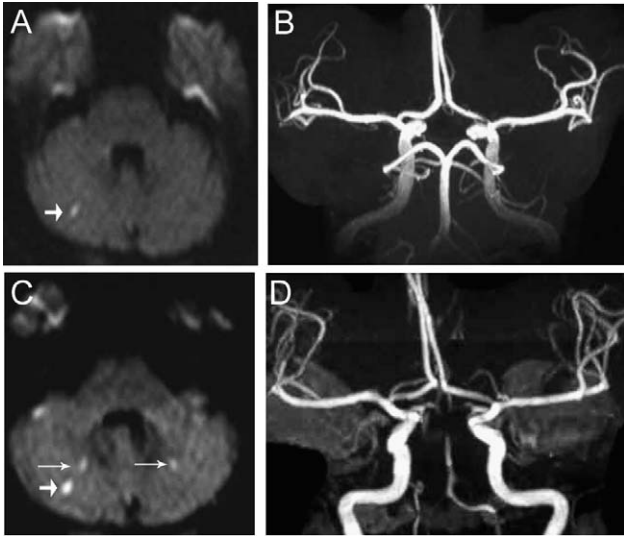


Fig. 1. (A) Axial magnetic resonance (MR) diffusion-weighted image (DWI) demonstrates a single small area of increased signal in the right cerebellum (short arrow) consistent with acute infarction. (B) MR angiogram of the intracranial vasculature demonstrates a patent basilar artery and superior cerebellar arteries. (C) Axial MR DWI performed 12 h later shows new infarctions in the right cerebellar hemisphere (long arrow) adjacent to the prior infarct (short arrow) and in the left cerebellar hemisphere (long arrow). (D) Corresponding MR angiogram shows absent flow in the distal basilar artery and superior cerebellar arteries.

repeat MRI DWI showed new areas of infarction in both cerebellar hemispheres (Fig. 1C), and the left midbrain and pons; no DWI abnormalities were visible in the hippocampi. MRA revealed a distal basilar artery occlusion (Fig. 1D).

The patient underwent emergent catheter angiography which confirmed a distal basilar occlusion. Both vertebral arteries and the proximal portion of the basilar artery appeared normal. The left vertebral artery was dominant. There was no evidence of vasospasm. Intra-arterial thrombolysis was started and recanalization of the vessel was achieved except for a small residual thrombus at the origin of the left superior cerebellar artery. Intravenous heparin was administered post-procedure. When heparin was discontinued briefly to remove the catheter sheath 24 h later, the patient abruptly developed a left third nerve palsy and severe right hemiparesis. Head CT showed no evidence of hemorrhage. Repeat catheter angiography showed recurrent distal basilar artery thrombosis extending into the proximal left posterior cerebral artery, and intra-arterial thrombolysis was once again administered with complete recanalization. Subsequent evaluation showed a left internal jugular vein thrombosis, extensive lymphadenopathy in the chest and abdomen, and a mucinous adenocarcinoma of the colon. Transesophageal echocardiogram was normal with no evidence of marantic endocarditis. Complete blood count, fibrinogen level, and coagulation studies were normal with the exception of a markedly elevated D-dimer. The patient was treated with enoxaparin and chemotherapy. At follow-up one month later, neurological examination was entirely normal except for a partial left third nerve palsy.

3. Discussion

The role of focal cerebral ischemia in the pathogenesis of TGA remains controversial. While several case reports have identified abnormalities on MRI DWI suggestive of acute ischemic stroke involving the mesial temporal lobes, thalami, and splenium of the corpus callosum [3–5], other case series have demonstrated consistently normal MRI DWI [6,7]. A more recent study using serial MRI scans has suggested that the timing of MRI evaluation may affect the likelihood of identifying DWI abnormalities. MRI performed within the first 24 h of symptom onset was generally normal, but follow-up scans 24–48 h later frequently revealed hippocampal DWI abnormalities [8]. It is not clear from this study whether these abnormalities reflect permanent ischemic brain injury as results of follow-up MRI at later time points were not reported. This point is critical, as another MRI study has demonstrated elevated signal intensity in the mesial temporal lobe on DWI in 7 of 10 patients, but without persistent abnormalities on follow-up MRI [9]. The authors of this study concluded that the observed DWI abnormalities were unlikely to represent ischemia/infarction, and more likely represented the migrainous phenomena of spreading cortical depression. This study illustrated the complex issue of the specificity of DWI lesions for ischemia/infarction, and raised concerns that some prior reports of DW MRI abnormalities in TGA patients may not in fact establish that the event was ischemic. Indeed, the risk of stroke following TGA appears to be extremely low, the risk factor profile of TGA patients is distinct from TIA patients, and the prevalence of migraine is higher in the TGA population compared to controls [1,10,11]. All these facts argue against an ischemic etiology for TGA.

In this respect, we believe our case provides strong and unique evidence that TGA can, at least in some cases, be the result of focal cerebral ischemia. We are not aware of any prior reports of TGA associated with a documented acute vascular occlusion. In our case, the location of the initial DWI lesion in the superior cerebellar artery territory and subsequent infarction in the same vascular territory associated with basilar thrombosis argue for transient posterior circulation ischemia as the etiology for the initial TGA event. We hypothesize that a hypercoagulable state from mucinous adenocarcinoma caused local thrombosis of the distal basilar artery. The difficulty in lysing the thrombus from the origin of the left superior cerebellar artery suggested local adherence to the vessel wall and a probable nidus for recurrent thrombus formation. A proximal embolic source is highly unlikely given the normal transesophageal echocardiogram and the fact that two separate emboli would have had to travel to the exact same location at two separate points in time. It has been proposed that TGA may be due to ischemia from venous congestion [12]. Our patient did have thrombosis of the left jugular vein, but there was no evidence on MRI of the typical tissue changes seen with thrombosis of draining cerebral veins.

In this case, no clinical findings initially allowed us to differentiate this serious cause of TGA from a benign cause. Initial brain MRI with DWI raised concerns about the possibility of ischemia as the cause of this patient's TGA, concerns that were promptly confirmed by the subsequent clinical course. We suggest that clinicians evaluating patients with TGA consider the possibility of a cerebrovascular event. Whether all patients or only a subset of patients should undergo diagnostic testing for cerebrovascular disease or receive medical therapy aimed at vascular risk reduction remains to be determined, but physicians should not assume an invariably benign prognosis for TGA.

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