

Carotid Angioplasty and Stenting in a Patient with Severe Internal Carotid Artery Stenosis Associated with Occlusion of the Vertebral and Contralateral Carotid Arteries

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ABSTRACT

Severe internal carotid artery (ICA) stenosis is a common cause of cerebrovascular accident (CVA) in middle-aged patients. Contralateral carotid occlusion (CCO) in patients with severe ICA stenosis is associated with high risk of CVA. Carotid endarterectomy (CEA) is associated with more complications in patients with CCO than those without CCO. In this study, we present the case of a 61-year-old patient who presented with multiple transient ischemic attack and severe ICA stenosis associated with CCO and occlusion of vertebral arteries. The patient was treated successfully with carotid angioplasty and stenting.

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Introduction

Internal carotid artery (ICA) stenosis is a common cause of cerebrovascular accident. The risk of stroke events is higher in patients with ICA stenosis accompanied by contralateral carotid occlusion (CCO). The management of ICA stenosis associated with CCO is controversial. In this study, we presented a patient with ICA stenosis associated with CCO and vertebral artery (VA) occlusion treated by carotid angioplasty and stenting (CAS).

Case Presentation

A 61-year-old male patient with medical

history of hypertension presented with two episodes of transient aphasia and right-sided hemiparesis, which resolved within less than one hour. Physical examination and non-enhanced computed tomography of the brain revealed no abnormal findings. However, magnetic resonance imaging (MRI) of the brain showed a lacunar infarction in the left basal ganglia (Figure 1).

Cerebral digital subtraction angiography showed severe stenosis of the left (ICA) at its origin associated with the complete occlusion of the right ICA and both (VAs) probably due to

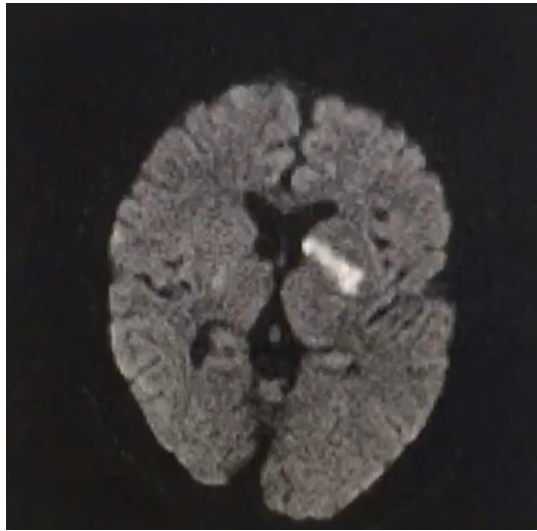
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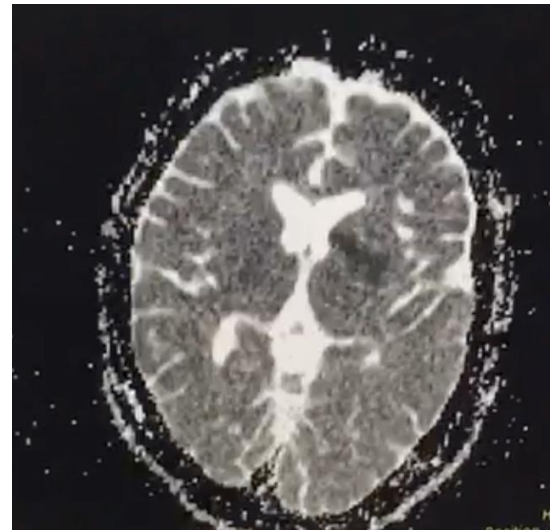
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dissection (Figures 2a, 2b). Left ICA stenosis was treated by balloon angioplasty and stenting

(Figure 2c). The patient was discharged after one day without any neurological deficits.



A



B

Figure 1. A: Diffusion weighted imaging showed hyperintensity in the head of caudate and the left basal ganglia, B: Apparent diffusion coefficient showed a small hypointense change in the head of caudate and the left basal ganglia



A



B



C

Figure 2. A: Right internal carotid artery (ICA) occluded at origin following probably dissection, B: Left ICA, high-grade stenosis at origin, C: Left ICA and post-carotid angioplasty and stenting treatment

Discussion

Cerebrovascular accident (CVA) is the third leading cause of mortality and the first cause of long-term disability. CVA patients usually present with sudden onset of neurological deficit such as hemiparesis or aphasia. MRI is the most sensitive tool for the diagnosis of infarction. Diffusion weighted imaging (DWI) and apparent diffusion coefficient (ADC) MRI sequences could reveal the lesion within the first hours of infarction.

Carotid stenosis accounts for 8-29% of all the ischemic strokes. The risk of ipsilateral stroke at 24 months was reported to be 26% in patients with symptomatic severe carotid stenosis (blockage of more than 70%) under medical treatment. According to the North American Symptomatic Carotid Endarterectomy Trial (NASCET), an absolute risk reduction of 17% was observed in these patients after carotid endarterectomy (CEA) (1).

Although CEA remains the gold standard intervention for severe carotid stenosis, both CEA and CAS have been used for decades (2). Moreover, (CCO) was detected in 6-10% of patients with severe carotid stenosis (3). Patients with asymptomatic carotid stenosis (the blockage of 60-70%) and CCO are at higher risk for CVA than the patients without CCO, in whom the risk of CVA is about 33% (4).

Based on the literature, CEA increases the risk of periprocedural CVA in patients with carotid artery stenosis and CCO more than the other patients (5). Furthermore, CAS is an effective interventional method with low adverse effects, which can be used to treat high-risk patients with severe carotid stenosis and those with severe carotid stenosis associated with CCO (5, 6). Our case was pretty much a case of CAS treatment efficacy and safety in patients with severe carotid stenosis associated with CCO and VA occlusion. In

contrast to CEA, during CAS treatment the blood flow to the brain is not interrupted that could be important if the brain had only one arterial supply.

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Conflict of Interest

The authors declare no conflicts of interest.

References

1. North American Symptomatic Carotid Endarterectomy Trial Collaborators, Barnett HJM, Taylor DW, Haynes RB, Sackett DL, Peerless SJ, et al. Beneficial effect of carotid endarterectomy in symptomatic patients with high-grade carotid stenosis. *N Engl J Med.* 1991; 325:445-53.
2. Meerwaldt R, Hermus L, Reijnen MM, Zeebregts CJ. Carotid endarterectomy: current consensus and controversies. *Surg Technol Int.* 2010; 20:283-91.
3. Baker WH, Howard VJ, Howard G, Toole JF. Effect of contralateral occlusion on long-term efficacy of endarterectomy in the asymptomatic carotid atherosclerosis study (ACAS). *ACAS Investigators. Stroke.* 2000; 31:2330-4.
4. AbuRahma AF, Metz MJ, Robinson PA. Natural history of > or =60% asymptomatic carotid stenosis in patients with contralateral carotid occlusion. *Ann Surg.* 2003; 238:551-61.
5. Ricotta JJ 2nd, Upchurch GR Jr, Landis GS, Kenwood CT, Siami FS, Tsilimparis N, et al. The influence of contralateral occlusion on results of carotid interventions from the Society for Vascular Surgery Vascular Registry. *J Vasc Surg.* 2014; 60:958-64.
6. Gonzalez A, Gonzalez-Marcos JR, Martinez E, Boza F, Cayuela A, Mayol A, et al. Safety and security of carotid artery stenting for severe stenosis with contralateral occlusion. *Cerebrovasc Dis.* 2005; 20:123-8.