

Internal Carotid Artery Stenting in a Case of Recurrent Transient Ischemic Attacks: A Road Less Taken

Babu Reddy, Huliurdurga Srinivasa Setty Natraj Setty*, Janakaloti Ramachandra Reddy Vijay Kumar, Chamrajanagara Mahadevappa Nagesh, Budanuru Chikkaswamy Srinivas, Cholenahalli Nanjappa Manjunath
Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bengaluru, Karnataka, INDIA.

ABSTRACT

The transient ischemic attack is a major harbinger of subsequent stroke. Carotid artery stenosis accounts for about 20% of ischemic strokes and TIAs. Though carotid endarterectomy has been the standard treatment for years, carotid artery stenting has emerged as a promising alternative. We report a case of a 51 year male patient who presented with the recurrent transient ischemic attacks and right facio-brachial weakness, the patient was promptly taken for carotid angiography and underwent successful stenting of the left internal carotid artery.

Key words: Carotid artery stenosis, Carotid angiography, Transient ischemic attack.

Correspondence

Dr. H.S Natraj Setty MD,DM

Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore, Karnataka, INDIA.

Ph.no: 9845612322

Fax No. 080-22977261

E-mail: drnatrajsetty75@gmail.com

Submission Date: 21-12-2017;

Revision Date: 24-12-2017;

Accepted Date: 08-01-2018.

DOI : 10.5530/jcdr.2018.1.10

INTRODUCTION

Stroke is a pervasive and critical cause of morbidity and mortality affecting the global population.¹ Transient ischemic attack (TIA), a type of minor stroke, is basically a brief neurological deficit ensuing from focal cerebral ischemia but does not result in permanent cerebral infarction.² The occurrence of TIA is a major harbinger of subsequent stroke. Among the patients in whom stroke has been observed, the incidence of prior TIA has been stated to range from 7% to 40%.¹ Symptomatic carotid stenosis, large artery atherosclerosis, and atrial fibrillation have been major causes of TIA.³ Carotid artery stenosis accounts for about 20% of ischemic strokes and TIAs.¹ However, the prevalence of carotid artery stenosis is not solely manifested in TIA. Carotid artery stenosis has also been associated with various clinical events like asymptomatic carotid disease, TIA affecting the eye or the brain, ischemic stroke in the cerebral territory supplied by the vessel and cognitive impairment as a result of carotid stenosis.¹ There are multiple treatment strategies available for restoring the flow of blood through the carotid artery. Since the advent of carotid endarterectomy (CEA) in 1954, it had been considered as the standard modality for management of carotid artery stenosis.⁴ Through decades, various alternatives have evolved for treating carotid artery stenosis. In 1990s carotid artery stenting (CAS) transpired as a less invasive budding alternative to CEA.⁴ The CAS has opted in patients who have high surgical risks due to medical comorbidities or anatomical high-risk features.¹ Here we present a case of a male patient with the recurrent TIAs and right facio-brachial weakness. On investigation, it was found that left internal carotid artery was severely stenosed and thus the patient was considered for undergoing CAS for treatment of recurrent TIAs.

Case presentation

A 51-year-old right-handed male patient presented with three episodes of recurrent transient ischemic attack and recovered spontaneously. On examination heart rate was 80 per min, blood pressure was 130/90mmHg, and right upper limb and facial weakness were present. The routine investigation was normal. VDRL, HIV and connective tissue profile were normal. The patient was not a known case of hypertension, diabetes mellitus or ischemic heart disease. Two-D echocardiography was normal; CT carotid angiogram demonstrated 90% stenosis in osteo-proximal (2.6mm) internal carotid artery (Figure 1). Carotid angiogram also revealed left internal carotid artery stenosis (Figure 2 (A)). Patient

successfully underwent percutaneous transluminal angioplasty (PTA) and stenting of the left internal carotid artery. A70X50mm wall stent was deployed through right brachial artery approach. Final carotid angiogram demonstrated good blood flow through left internal carotid artery post-stenting (Figure 2 (B)). The patient improved symptomatically and is on regular follow up since 1 year.

DISCUSSION

The carotid artery occlusion or near-occlusion is caused by an arterial dissection or atherosclerotic plaque. Treatment of carotid stenosis poses a risk of release of large clot into the intracranial vasculature which would result in severe stroke symptoms. Thus, appropriate selection of treatment modality is essential. Owing to this, the AHA/ASA Guidelines



Figure 1: CT carotid angiogram demonstrating 90% stenosis in osteo-proximal (2.6mm) internal carotid artery.

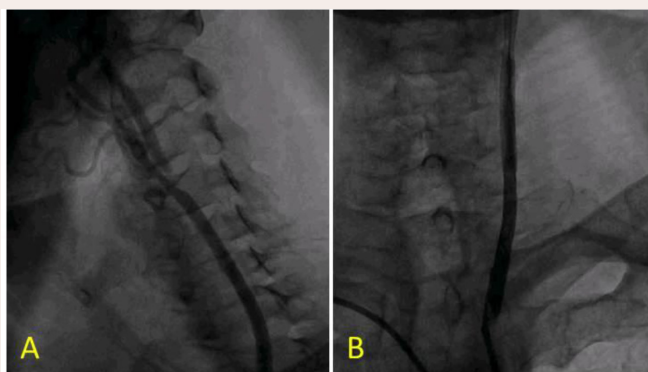


Figure 2: (A) Carotid angiography showing left internal carotid artery stenosis; (B) Final carotid angiography showing left internal carotid artery post-stenting.

have posted recommendations for patients with carotid disease.⁵ The guideline recommends that CAS is indicated as an alternative to CEA for symptomatic patients at average or low-risk of complications associated with endovascular intervention when the diameter of the lumen of the internal carotid artery is reduced by >70% by noninvasive imaging or >50% by catheter-based imaging. Moreover, it recommends considering patient age in choosing between CAS and CEA. For younger patients (i.e., younger than ≈70 years), CAS is equivalent to CEA in terms of risk for periprocedural complication (ie, stroke, MI, or death) and long-term risk for ipsilateral stroke. In accordance with the guideline, this case demonstrates a 51-year-old male patient who presented with three episodes of recurrent transient ischemic attacks, was diagnosed with 90% stenosis of the left internal carotid artery. The carotid artery stenting was performed in this patient. A 70X50mm wall stent was deployed through right brachial artery approach. The patient improved symptomatically and is on regular follow up since 1 year.

Recurrent TIAs more likely pose the chances of occurrence of stroke in near future. Thus mandates prompt and apt treatment. Numerous trials have compared the effectiveness of CAS and CEA in secondary stroke prevention.^{6,7,8,9,10} However, these studies lacked adequate power to demonstrate non-inferiority or superiority of CAS in terms of early risks or late benefits.¹ Thus, the treatment of each individual should be preceded by an evaluation of tailored history and physical examination along with a review of any available imaging and laboratory tests. Cases involving the carotid stenosis subsequently been treated with successful CAS are scarce. Kouvelos GN, *et al.* had recently reported a case of CAS in an external carotid artery in an 80-year-old patient experiencing limb-shaking TIAs.¹¹ To the best of our knowledge, this is the first case demonstrating successful CAS in a patient who presented with recurrent TIAs due to internal carotid artery stenosis. In addition, the prognosis of the patient has been favorable for one year. Nevertheless, CAS is not devoid of disadvantages. It poses detriments such as arterial dissection, dislocation of atherothrombotic debris and embolization to the brain or

eye, late embolization, bradycardia, hematoma and aneurysm formation at the site of cannulation. Moreover, development of late restenosis is more common after stenting than after endarterectomy.¹ Thus the procedure, regardless of the type of intervention, must be performed with finesse by experienced hands. Though guidelines pose various recommendations, patients' preferences and anatomy must also be taken into consideration for treatment of carotid artery stenosis.⁴

CONCLUSION

Coronary artery stenting can be considered as a competent alternative to carotid endarterectomy when performed by adept hands. It can be a better choice for patients who are at high surgical risk, and for patients younger than 70 years of age. Yet, patients' preferences and anatomy must also be scrutinized.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

ABBREVIATION USED

TIA: Transient Ischemic Attack; **CEA:** Carotid Endarterectomy; **CAS:** Carotid Artery Stenting; **VDRL:** Venereal Disease Research Laboratory; **HIV:** Human Immunodeficiency Virus; **CT:** Computed Tomography; **PTA:** Percutaneous Transluminal Angioplasty; **AHA/ASA:** American Heart Association/American Stroke Association.

REFERENCES

1. Lovrencic-Huzjan A, Rundek T, Katsnelson M. Recommendations for management of patients with carotid stenosis. *Stroke Research and Treatment*. 2012;2012.
2. Easton JD, Saver JL, Albers GW, Alberts MJ, Chaturvedi S, Feldmann E, *et al.* Definition and evaluation of transient ischemic attack. *Stroke*. 2009;40(6):2276-93.
3. Al-Khaled M, Scheef B. Symptomatic carotid stenosis and stroke risk in patients with transient ischemic attack according to the tissue-based definition. *International Journal of Neuroscience*. 2016;126(10):888-92.
4. Gahremanpour A, Perin EC, Silva G. Carotid artery stenting versus endarterectomy: a systematic review. *Texas Heart Institute Journal*. 2012;39(4):474.
5. Kernan WN, Ovbiagele B, Black HR, Bravata DM, Chimowitz MI, Ezekowitz MD, *et al.* Guidelines for the prevention of stroke in patients with stroke and transient ischemic attack. *Stroke*. 2014;STR. 0000000000000024.
6. Gurm HS, Yadav JS, Fayad P, Katzen BT, Mishkel GJ, Bajwa TK, *et al.* Long-term results of carotid stenting versus endarterectomy in high-risk patients. *New England Journal of Medicine*. 2008;358(15):1572-9.
7. Group SC. 30 day results from the SPACE trial of stent-protected angioplasty versus carotid endarterectomy in symptomatic patients: a randomised non-inferiority trial. *The Lancet*. 2006;368(9543):1239-47.
8. Mas J-L, Trinquart L, Leys D, Albuquer JF, Rousseau H, Viguier A, *et al.* Endarterectomy Versus Angioplasty in Patients with Symptomatic Severe Carotid Stenosis (EVA-3S) trial: results up to 4 years from a randomised, multi-centre trial. *The Lancet Neurology*. 2008;7(10):885-92.
9. Ringleb PA, Chatellier G, Hacke W, Favre J-P, Bartoli J-M, Eckstein HH, *et al.* Safety of endovascular treatment of carotid artery stenosis compared with surgical treatment: a meta-analysis. *Journal of Vascular Surgery*. 2008;47(2):350-5.
10. Brown M, Rogers J, Bland J. Endovascular versus surgical treatment in patients with carotid stenosis in the Carotid and Vertebral Artery Transluminal Angioplasty Study (CAVATAS): a randomised trial. *The Lancet*. 2001;357(9270):1729-37.
11. Kouvelos GN, Nassis C, Papa N, Papadopoulos G, Matsagkas MI. Limb-shaking transient ischemic attacks successfully treated with external carotid artery stenting. *Case Reports in Medicine*. 2012;2012.

Cite this article: Reddy B, Setty HSN, Kumar VJR, Nagesh, Srinivas, Manjunath CN. Internal Carotid Artery Stenting in a Case of Recurrent Transient Ischemic Attacks: A Road Less Taken. *J Cardiovasc Disease Res*. 2018; 9(1):39-40.