Neurosurgical Forum LETTERS TO THE EDITOR

Endovascular revascularization for symptomatic extracranial vertebral artery occlusion

TO THE EDITOR: We read with great interest the article by Duan et al.² (Duan H, Mo D, Zhang Y, et al: Carotid–vertebral artery bypass with saphenous vein graft for symptomatic vertebrobasilar insufficiency. *Neurosurg Focus* 46(2):E8, February 2019) which shows that ECA–SV–VA (external carotid artery–saphenous vein–vertebral artery [VA]) bypass is a useful treatment for patients with symptomatic steno-occlusion of the proximal VA or subclavian artery.

We agree that symptomatic steno-occlusive diseases of the vertebrobasilar vasculature carry poor prognoses and high risk of stroke recurrence despite medical therapy. Occlusive ostial disease of the VA can cause ischemic symptoms or strokes through hemodynamic compromise or arterial embolism. Treatment options include medical, surgical, and endovascular revascularization. When medical treatment fails at controlling vertebrobasilar insufficiency or embolism, endovascularization and surgical treatment are considered. The aim of treatment is to improve hemodynamics and/or to eliminate an emboligenic source in the posterior circulation. However, the optimum treatment for these patients remains controversial and empirical.

In the article by Duan et al.,² the authors write that “Angioplasty or stenting might be a promising treatment for stenosis at the origin of the VA, but the procedure is

not suitable for occlusion or cases of in-stent stenosis.” Indeed, with the development of endovascular equipment and techniques, endovascular revascularization is used increasingly in chronic total occlusions of the coronary artery, internal carotid artery, subclavian artery, and extracranial VA. We performed a review of the English-language literature from 2008 to 2019, which revealed 8 publications (case reports and case series) describing endovascular revascularization of symptomatic extracranial VA occlusion (including in-stent occlusion).^{1,3–9} The patients with endovascular revascularization included in these studies are summarized in Table 1. Also, in our center (West China Hospital, Sichuan University), we have performed endovascular revascularization in 23 patients. Successful percutaneous angioplasty and stenting were achieved for 21 (91.30%) patients, and complications occurred in 1 patient (4.35%).

Based on the existing evidence and our experience, we think that selected patients could benefit from endovascular revascularization, and that endovascular revascularization might be a treatment alternative to bypass in some patients.

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TABLE 1. Summary of reported cases in the literature

Authors & Year	No. (%) of Cases		
	Total	Successful	w/ Complication
Iwata et al., 2009	1	1 (100%)	0
Xu et al., 2009	1	1 (100%)	0
Gupta et al., 2011	1	1 (100%)	0
Iwata et al., 2012	2	2 (100%)	0
Noorian et al., 2012	1	1 (100%)	0
Dementovych et al., 2012	1	1 (100%)	0
Nii et al., 2013	1	1 (100%)	0
Park et al., 2014	8	7 (87.5%)	1 (12.5%)

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Disclosures

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Response

We read with great interest the letter by Drs. Chen and Zheng in which they present evidence that endovascular revascularization might be an effective alternative therapy for patients with symptomatic in-stent stenosis of the VA. We totally agree with the viewpoint of these 2 authors. In fact, for symptomatic in-stent stenosis patients, we always select endovascular revascularization as the first treatment choice. This is also why so few patients

were selected for bypass surgery treatment in the study from 2008 to 2016 reported in our article. We also have a lot of experience in endovascular treatment using drug-eluting stents or drug-eluting balloons in patients with symptomatic in-stent stenosis, and we have high rates of revascularization and good outcomes. However, what we emphasized in our article is that for those patients with an occlusive VA or in-stent stenosis, if endovascular revascularization therapy fails, bypass surgery might be a good choice. A good example is the first case we reported in the article, the patient with left subclavian artery occlusion. In this case we tried revascularization but failed, so we performed bypass surgery and succeeded. We also note that in their letter Drs. Chen and Zheng report that they performed endovascular revascularization in 23 patients and achieved successful percutaneous angioplasty and stenting in 21 (91.30%) patients, whereas complications occurred in 1 patient (4.35%). That also means that there were 2 patients in whom endovascular revascularization therapy failed. We believe that the ECA-SV-VA (external carotid artery–saphenous vein–vertebral artery) bypass procedure described in our article might be a good treatment choice for these 2 patients.

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