Symptomatic Intracranial Atherosclerotic Disease
What Is the Best Treatment Option?

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See related article, pages 1766–1769.

Symptomatic intracranial atherosclerotic disease carries a significant risk for future ipsilateral ischemic events regardless of the use of warfarin or aspirin.1 Patients presenting with a lesion that is >70% appear to be most vulnerable with a 1-year risk of 23% for a subsequent ipsilateral event.2 Moreover, poor control of blood pressure and cholesterol appear to be associated with a higher risk of a subsequent stroke. At 1-year follow-up in the WASID study, 58% of patients were still found to have a LDL cholesterol of >100 mg/dL despite 91% of patients being on lipid-lowering therapy, and 50% of patients were found to have a systolic blood pressure >140 mm Hg.3 Recent guidelines suggest that patients at high risk for vascular disease may benefit from LDL cholesterol levels below 70 mg/dL,4 which was achieved in only 12% of patients in the WASID study at 1-year follow-up.3 This has highlighted the importance of vascular neurologists being more aggressive with risk factor modification as stroke victims are at a high risk for future vascular events.5

Endovascular therapy with balloon angioplasty for symptomatic intracranial atherosclerosis was first reported over 2 decades ago.6 Since this report, there have been several single institution reports along with multicenter registries showing the feasibility of performing angioplasty and/or stenting for symptomatic intracranial atherosclerotic lesions. No consensus has been reached as to the best endovascular modality (ie, balloon mounted stents, self-expanding stents or balloon angioplasty) to treat this disease. Due to the cerebrovascular tortuosity, there has been concern over the delivery of stiffer balloon mounted stents into the intracranial vasculature. With improving technology, the rates of successful delivery appear to be increasing with reports of success as high as 92% to 96%.7,8 The Wingspan stent system (Boston Scientific Corp) is a self-expanding stent that has been shown to also have a high success rate of delivery to the intracranial vasculature.9,10 There have been concerns over the high rate of restenosis (30%)11 associated with the Wingspan Stent, and some have argued that it may not be beneficial to place the stent after the angioplasty12 as there is not a substantial luminal gain (44% residual stenosis postangioplasty to 27% post–stent placement).9 Moreover, many of these studies do not address the medical compliance of patients in regards to blood pressure and cholesterol at follow-up. Patients with intracranial atherosclerosis appear to be in a high risk category, and thus medical control of risk factors may play a critical role in the success of preventing future vascular events or restenosis in patients treated with stents.

In this issue of Stroke, Mazighi et al13 report their experience with the use of balloon mounted stents or angioplasty alone for symptomatic intracranial lesions >70% that have failed maximal medical therapy. Importantly, only patients who presented with atheroembolic strokes were considered for stent placement and not patients with local perforator disease. In this cohort of patients, a wide array of coronary balloon mounted stents was used, but the failure rate to deliver a stent occurred in 8.7% of patients. This is similar to the rates of success described in other studies using balloon mounted stents.7,8 The authors show that periprocedural complication rate was 10.1%, but only an additional 2.9% of patients developed stroke or death at 24-month follow-up. This is similar to the findings of the SSYLVIA study where there was a 7.2% periprocedural rate of stroke, and at 1 year an additional 3.7% of patients were found to develop an ipsilateral stroke.14 In the Wingspan registry, 5 of 78 (6.4%) of patients had a periprocedural complication,9 whereas an additional 8 of 78 (10.3%) developed a symptomatic restenosis in follow-up.11 These reports suggest that patients treated with self-expanding stents may have a risk of delayed events, whereas treatment with balloon mounted stents may have a higher risk in the periprocedural period.

The authors of the current study also show that the rate of restenosis was 7.5% in patients treated with stents and 50% in patients treated with angioplasty alone with an overall rate of 15.9% for the cohort. One factor found to be associated with restenosis was a smaller vessel diameter. The importance of restenosis is still debatable, as only 2 patients (2.9%) developed symptoms referable to the restenosis. The causes of late lumen loss are not fully understood, but percent residual stenosis after stent deployment appears to be a significant predictor of restenosis in coronary vessels.15 In the current study as well as other reports, the poststent stenosis was under 10%.7,13 This may be an important parameter in prediction of restenosis during intracranial stent placement in the future, and stent type may play a role in this.

Given the high morbidity associated with symptomatic intracranial atherosclerosis, there has been interest in developing a randomized controlled study comparing stenting and angioplasty to medical therapy alone for symptomatic lesions ≥70%.16 As these studies are designed, it will be important to
recognize the differences in stent technology as well as the importance of medical compliance to achieve reduction of patient risk factor profiles as defined by current practice guidelines for these high risk patients.

Disclosures
None.

References

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