

## Cerebral Revascularization for Ischemic Cerebrovascular Disease of the Anterior Circulation: What Indications Remain After COSS?

Timothy G. White MD, BA; Aubrey Rogers; Ralph Rahme M.D.; Erez Zeev Nossek MD; Jason A. Ellis MD; Rafael Alexander Ortiz MD; John A. Boockvar MD; David J. Langer MD

Department of Neurosurgery, Lenox Hill Hospital, Zucker School of Medicine at Hofstra/Northwell, New York, NY, USA

### Introduction

Since the publication of COSS, there has been a sharp reduction in the rate of revascularization surgery for non-moyamoya ischemic cerebrovascular disease (ICVD). However, a small subset of patients continue to suffer ischemic events despite maximal medical therapy.

### Methods

All consecutive patients with medically refractory non-moyamoya ICVD of the anterior circulation, in whom cerebral revascularization was performed by the senior author (D.J.L.) between late 2010 and 2017 were included. Charts were retrospectively reviewed and demographic, clinical, imaging, operative, and outcome data were recorded.

### Results

Nine patients, 5 women and 4 men with mean age 52 years (42-67), were included.

One patient had bilateral internal carotid artery (ICA) occlusion with severely impaired CVR and cerebral blood flow on SPECT-acetazolamide and quantitative MRA.

Of the remaining 8 patients, 5 had unilateral ICA occlusion and 3 had severe middle cerebral artery stenosis, all of whom were symptomatic despite maximal medical therapy.

Two patients had blood pressure-dependent neurologic exams requiring ICU stay and vasopressor support. All 7 patients who underwent SPECT-acetazolamide had evidence of impaired CVR.

STA-MCA bypass was performed in all 9 patients, on the symptomatic side in 8 and the side with worse CVR in 1. Immediate bypass graft patency was 100%. There were no deaths or permanent morbidity. One patient (11.1%) developed transient aphasia secondary to hyperperfusion, following left hemispheric revascularization.

After a mean follow-up of 9 months (6 months–5 years), no recurrent ischemic events were observed. Delayed, asymptomatic graft occlusion was observed in 1 patient at the 1-year angiographic follow-up (1-year graft patency: 88.9%). This patient underwent repeat revascularization via an indirect technique.

### Conclusions

In the post-COSS era, cerebral revascularization remains a safe and highly effective treatment modality for well-selected ICVD patients, specifically those who fail maximal medical therapy and those with severe cerebral hemodynamic insufficiency requiring vasopressor support.