

Emergent Carotid artery stenting with or without intracranial tandem occlusion thrombectomy following carotid endarterectomy

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Introduction

Stroke in the immediate post operative period following carotid endarterectomy is usually due to carotid thrombosis. Many centers have begun incorporating angiography before re-exploration, which has the advantage of confirming carotid occlusion and treating tandem intracranial lesions. The aim of this study is to determine the safety and efficacy of this strategy.

Methods

A retrospective review was performed of all cases undergoing stenting of the carotid artery following carotid endarterectomy utilizing the Precise stent system (Cordis, Bridgewater, NJ) from November 2009 to June 2013 at the Medical University of South Carolina. Charts, operative notes, and angiographic images were reviewed. Four cases are summarized including indications for endarterectomy, use of a patch, medical co-morbidities, time to symptom onset, and outcomes. All carotid endarterectomies were performed by experienced vascular surgeons under general endotracheal anesthesia. All neurointerventional cases were performed under general anesthesia by a team of experienced neurointerventionalists.

Results

4 patients were identified. The mean age was 69 years (+/- 8.3 years). Three of four patients were males. All had greater than 70% carotid stenosis prior to carotid endarterectomy. Three patients were symptomatic at the time of their CEA. One patient had intraoperative occlusion and dissection of the ICA which was noted on intraoperative carotid duplex ultrasound. In three cases where the patients developed post operative occlusions, the mean time from CEA to symptom onset was 18.8 hours (range 1-52 hours, 28.75hrs). The mean time from symptom onset to procedure was 5.6 hours (range 3-11, +/- 4.6 hrs). All three patients were evaluated by a stroke neurologist. The average NIHSS was 24.7 (range 20-31, +/-5.7). The mean time from groin puncture to closure was 91.25 minutes (40-160 minutes, +/- 58.6) One patient had a tandem intracranial occlusion and underwent thrombectomy. One patient developed dissection of the paraclinoid segment of the internal carotid artery. In all four cases, recanalization was successfully completed between 40 to 160 minutes. There were no procedural complications.

Table 1.

	Age	Gender	% Carotid Stenosis	Symptomatic
Case 1	66	M	90	N
Case 2	73	M	80-99	Y
Case 3	78	M	70	Y
Case 4	59	F	80-99%	Y

Patient demographics

Table 2

	Time from CAE to symptom (hrs)	Time from last normal to thrombectomy (hrs)	NIHSS	% Re-occlusion	Tandem intracranial occlusion
Case 1	1	3	20	100%	N
Case 2	0*	0	NA	100%	Y**
Case 3	3.5	3	31	50%	Y
Case 4	52	11	23	100%	N

* At the completion of surgery, carotid duplex scan demonstrated sluggish flow and so the patient was not emerged from anesthesia and was taken immediately to CT and then to neuroangiography.

** Dissection of the proximal internal carotid artery which extended into the paraclinoid portion of the intracranial internal carotid artery

Preprocedure metrics

Table 3

	Procedure Time (minutes)	Intraprocedure complications	mRS at last follow up
Case 1	40	None	0
Case 2	160	None	0
Case 3	120	None	6
Case 4	45	None	3

Case length and post procedural outcomes.

Conclusions

Emergent endovascular evaluation in the setting of acute post CEA thrombosis is a safe and timely treatment option, with the benefit of detecting and treating embolic intracranial lesions. More investigation is necessary to define the role of immediate angiography and intervention in this rare surgical complication.