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Carotid Occlusion Revisited: Using Imaging Modalities to Predict Patients Who Would Benefit from Carotid Thromboendarterectomy

Kendrick Johnson; Klopfenstein Jeffrey
University of Illinois College of Medicine Peoria
Illinois Neurological Institute

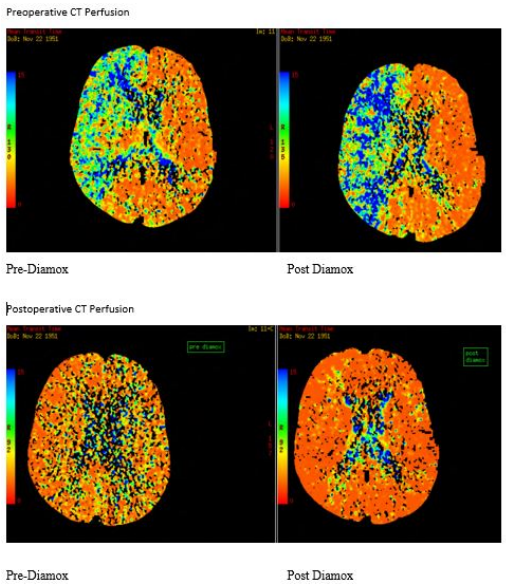
Introduction

Carotid occlusion in the setting of Stage II hemodynamic failure is associated with high rates of subsequent cerebral ischemia. Carotid Thromboendarterectomy (CTEA) is thought to be an effective intervention in a select group of patients with carotid occlusion. To date, the effect of CTEA on cerebral hemodynamics of the affected hemisphere has not been assessed.

Methods

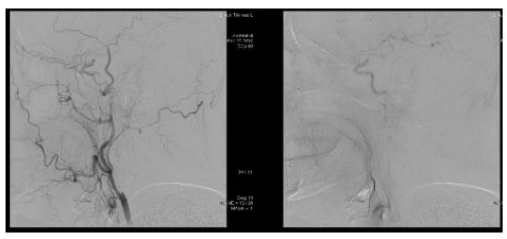
Presented, is a single center, retrospective review of patients who underwent CTEA after presenting with symptomatic acute internal carotid occlusion and stage II hemodynamic failure. Patient inclusion criteria were carotid occlusion confirmed by angiography with siphon reflux and computed tomography perfusion (CTP) studies demonstrating steal phenomenon, consistent with stage II hemodynamic failure. All subjects underwent postoperative CTP to assess hemodynamic status and were followed for the development of stroke or any cause mortality.

Patient Pre and Postoperative CT Perfusion Studies



Single Patient pre and post operative CTP with Diamox challenge. Improvement from Stage II to Stage 0 Hemodynamic State post CTEA.

Preoperative Cerebral Angiogram



Lateral CCA Injection revealing lack of anterograde flow in the ICA, however late arterial phase reveals Petrous Carotid reflux.

Results

Ten patients conformed to all inclusion criteria. Mean time to intervention was 49 hours (range 2-240 hours). Seven (70%) patients returned to stage 0 cerebral hemodynamic state. The remaining 3 (30%) patients improved to stage I cerebral hemodynamic state. CTEA was successful in all patients, as confirmed by intraoperative restoration of flow. On follow up, nine patients had postoperative angiographic imaging available for review. Of those available for review, all patients showed persistent patency of the carotid artery with restored antegrade flow. Upon discharge, mean NIHSS was 4.1, compared to mean preoperative NIHSS of 6.6. No strokes or any cause mortality were noted within the first 30 postoperative days.

Conclusions

CTEA for acute carotid occlusion can be performed safely and appears to provide partial or complete restoration of normal cerebral hemodynamics in patients presenting with documented stage II hemodynamic failure. Consideration should be given to routine hemodynamic assessment of patients presenting with symptomatic carotid occlusion with subsequent CTEA for select patients with stage II hemodynamic failure.

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