

Management of Acute Ischemic Stroke Due to Tandem Occlusion: Extracranial or Intracranial Revascularization First?

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Introduction

Acute tandem occlusions of intracranial large vessel and cervical internal carotid artery present treatment challenges. Controversy exists regarding which lesion should be addressed first. The authors evaluated the endovascular approach for revascularization of these lesions.

Methods

Authors performed a retrospective review of prospectively maintained databases and analyzed demographic, radiological, and clinical outcome data for patients who underwent endovascular treatment for tandem occlusions.

Results

Sixty-five patients were identified. The average age was 68 years; the mean National Institutes of Health Stroke Scale score at presentation was 16.1. Twenty-five patients received intravenous thrombolysis before undergoing endovascular treatment. Fifty-four (83%) of the 65 proximal cervical internal carotid artery occlusions were atherothrombotic lesions. Fifty-five patients underwent a proximal-to-distal approach with carotid artery stenting first, followed by intracranial thrombectomy, whereas 10 patients underwent a distal-to-proximal approach (that is, intracranial thrombectomy was performed first). Intracranial thrombectomy techniques included, aspiration alone was used in 25 cases, stent retrieval alone was used in 9, and a combination of aspiration and stent-retriever thrombectomy was used in the remaining 31. Revascularization average time was 76 minutes. Successful recanalization (thrombolysis in cerebral infarction Grade 2b/3) was achieved in 57 (87.69%) patients. Mean National Institutes of Health Stroke Scale scores were 8.8 immediately postprocedure ($p < 0.05$) ($n = 56$), 5.6 at discharge ($p < 0.05$) ($n = 56$), and 2.8 at 3 months ($p < 0.05$) ($n = 51$). There were 8 in-hospital deaths (12%); and 4 patients (6.1%) had symptomatic intracranial hemorrhage within 24 hours postprocedure. Favorable outcomes (mRS score = 2) were achieved at 3 months in 40 (78.43%) of 51 patients available for follow-up, with an mRS score of 3 for 11 of 51 (21.56%) patients.

Conclusions

High recanalization rates of tandem occlusion is possible using acute carotid artery stenting and mechanical thrombectomy concurrently. Proximal-to-distal and aspiration approaches were most commonly used because they were safe, efficacious, and feasible. Further randomized controlled trial are needed to determine the best sequence.

Learning Objectives

Identify tandem occlusions (acute cervical carotid artery and intracranial large vessel occlusions) and their high morbidity and mortality

Identify the challenges in management of tandem occlusion

Learn the endovascular techniques involved in the management of tandem occlusion that offers the best surgical and clinical result