Non-inferiority of a Direct Aspiration First-pass Technique Versus Stent Retriever Thrombectomy in Emergent Large-vessel Intracranial Occlusions

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Introduction

Endovascular thrombectomy in patients with acute ischemic stroke caused by occlusion of proximal anterior circulation arteries has emerged as superior to standard medical therapy. While stent retriever thrombectomy with or without aspiration assistance was utilized in the five randomized controlled trials that demonstrated the efficacy of endovascular thrombectomy, several studies have also highlighted the efficacy of a direct aspiration first-pass technique (ADAPT).

Methods

To compare the angiographic and clinical efficacy of ADAPT versus stent retriever thrombectomy in patients with emergent large-vessel occlusions (LVOs) of the anterior intracranial circulation, the records of 129 patients treated with endovascular thrombectomy from June 2012 to October 2015 were retrospectively reviewed.

Results

Within this cohort, 117 patients were eligible for evaluation. ADAPT was utilized in 47 patients, 20 (42.5%) of whom required eventual stent retriever thrombectomy ("ADAPT failure/stent retriever rescue"), while primary stent retriever thrombectomy was performed in 70 patients. Patients in the ADAPT group were slightly younger than patients in the stent retriever group (63.5 versus 69.4 years; $P = 0.04$); however, there were no other differences in baseline clinical or radiographic factors. Procedural time (54.0 versus 77.9 mins; $P < 0.01$) and time to TICI 2b/3 recanalization (294.3 versus 346.7 mins; $P < 0.01$) were significantly lower in the ADAPT versus the stent retriever group. Rates of TICI 2b/3 recanalization were similar between the ADAPT and stent retriever groups (82.9% versus 71.4%; $P = 0.19$). There were no differences in rates of symptomatic intracranial hemorrhage or procedural complications. Rates of good neurological outcome (modified Rankin Score 0-2) at 90 days were similar between the ADAPT and stent retriever groups (48.9% versus 41.4%; $P = 0.45$), even when accounting for the ADAPT failure/stent retriever rescue cohort.

Conclusions

The present study confirms that ADAPT is non-inferior to primary stent retriever thrombectomy for acute ischemic stroke due to emergent LVOs. Given reduced procedural times, time to TICI 2b/3 recanalization, and potentially lower resource utilization with equivalent outcomes, an initial attempt of ADAPT may be warranted prior to stent retriever thrombectomy.

Learning Objectives

By the conclusion of this session, participants should be able to:

1) Describe the different techniques in intervention for acute ischemic stroke due to anterior circulation large-vessel occlusion.

2) Discuss, in small groups, the pros and cons of each modality of endovascular thrombectomy.

3) Identify an effective endovascular treatment paradigm for patients with acute ischemic stroke.