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PERIPHERAL

Safety and Efficacy of Stent Retrievers for the Management of Acute Ischemic Stroke

Comprehensive Review and Meta-Analysis

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CME Objective for This Article: At the completion of this article, the learner should be able to: evaluate the safety and efficacy of stent retriever for the management of acute ischemic stroke.

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ABSTRACT

OBJECTIVES This study sought to evaluate the safety and efficacy of stent retriever for the management of acute ischemic stroke.

BACKGROUND Stroke is the third leading cause of death and the most common cause of disability in the United States. Early reperfusion has been associated with favorable outcomes. Stent retrievers are novel endovascular devices that provide vessel recanalization via thrombus retrieval mechanical thrombectomy.

METHODS The authors performed a literature search using PubMed, EMBASE, and Cochrane Central Register of Controlled Trials from May 2005 to May 2015. Randomized controlled trails (RCTs) comparing endovascular therapy (ET) with the use of retrievable stents against standard therapy (ST) for the management of acute stroke were included.

RESULTS Five RCTs (the MR CLEAN, ESCAPE, EXTEND-IA, SWIFT-PRIME, and REVASCAT studies) with 634 patients in the ET group and 653 patients in the ST group met inclusion criteria. The frequency of a low 90-day modified Rankin Score (0 to 2) in the intervention group was 42.6% compared with 26.1% in the control group (odds ratio: 2.43; 95% confidence interval [CI]: 1.9 to 3.09; $p < 0.0001$). The frequency of intracranial bleeding was 4.2% in the ET group compared with 4.3% in the ST group (risk ratio: 1.08; 95% CI: 0.64 to 1.82; $p = 0.78$). 90-day mortality was 15.1% in the ET group compared with 18.7% in the ST group (risk ratio: 0.81; 95% CI: 0.58 to 1.12; $p = 0.19$). There was no evidence of significant heterogeneity or publication bias for any of the endpoints.

CONCLUSIONS On the basis of the results of this meta-analysis of RCTs, ET with stent retrievers appears as a safe and effective therapeutic option for acute ischemic stroke due to large vessel occlusion. (J Am Coll Cardiol Intv 2015;8:1758–65)

Stroke is the third leading cause of death and the most common cause of disability in the United States (1). For acute ischemic stroke, early reperfusion has been associated with favorable outcomes (2). To date, intravenous thrombolysis within 4.5 h after the onset of acute stroke symptoms is the most widely accepted strategy for prompt recanalization (3). However, the narrow time window, the low recanalization rates in patients with large vessel occlusion and bleeding complications often limit its use (4). Catheter-based therapies such as thromboembolectomy, suction thrombectomy, angioplasty with stenting, and stent retriever thrombectomy have been tried in patients with acute ischemic stroke alone or combined with intravenous or intra-arterial thrombolysis with variable recanalization and clinical outcomes (5,6). The best endovascular method has not yet been reliably determined. Stent retrievers (or retrievable stents) are endovascular devices that provide vessel recanalization via thrombus-retrieval mechanical thrombectomy. They are deployed inside the clot in order to envelop it within the stent struts. Subsequently, the stent retriever with the entrapped thrombus is pulled out of the artery. This mechanism combines the high rates of prompt flow restoration with stenting and mechanical thrombectomy without the risks of in-stent restenosis and thrombosis with conventional stents (7). They have been successfully used in recent acute stroke randomized controlled trials (RCTs). In view of several recently published large RCTs, the present meta-analysis seeks to systematically analyze the available evidence to evaluate the safety and efficacy of stent retriever therapy for the management of acute ischemic stroke.

METHODS

A protocol was prospectively developed that detailed the specific objectives, criteria for study selection, approach to assess study quality, outcomes, and