

Carotid Stenting With Antithrombotic Agents and Intracranial Thrombectomy Leads to the Highest Recanalization Rate in Patients With Acute Stroke With Tandem Lesions



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ABSTRACT

OBJECTIVES The aim of this study was to identify the optimal endovascular approach in patients with acute stroke with tandem lesions.

BACKGROUND At present, there is no consensus about the ideal technical strategy for the endovascular treatment of patients with acute ischemic stroke with tandem lesions of the extracranial internal carotid artery (ICA) and intracranial cerebral arteries.

METHODS This was an international, multicenter registry with a total of 482 patients with acute ischemic stroke and tandem lesions. Patients were treated by intracranial thrombectomy as well as 1 of the following 4 strategies: 1) acute carotid artery stenting of the extracranial ICA with antithrombotic agents; 2) acute carotid artery stenting of the extracranial ICA without antithrombotic agents; 3) balloon angioplasty of the extracranial ICA; and 4) intracranial thrombectomy alone. The main outcome endpoints of the study were the degree of recanalization and the 90-day clinical outcome. The safety endpoints were symptomatic intracerebral hemorrhage and all causes of mortality at 90 days.

RESULTS Using univariate analysis, the rates of successful reperfusion (modified Thrombolysis in Cerebral Infarction grades 2B and 3) and favorable clinical outcome after 90 days were significantly higher after acute carotid stenting with antithrombotic therapy and thrombectomy compared with the group with thrombectomy alone. After adjusting for confounding variables, acute stenting with antithrombotic therapy was independently associated with successful recanalization (odds ratio: 2.4; 95% confidence interval: 1.25 to 4.59; $p = 0.008$). The rates of symptomatic intracerebral hemorrhage and 90-day mortality were comparable among all 4 treatment groups.

CONCLUSIONS Acute stenting of the extracranial ICA with antithrombotic therapy in combination with intracranial thrombectomy is associated with higher recanalization rates in treatment of patients with acute stroke with tandem lesions. (J Am Coll Cardiol Interv 2018;11:1290–9) © 2018 by the American College of Cardiology Foundation.

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Tandem lesions in patients with acute ischemic stroke (AIS) are a combination of high-grade stenosis or occlusion of the extracranial segment of the internal carotid artery (ICA) with concurrent occlusion of an intracranial vessel (1,2). The treatment of tandem lesions represents a considerable challenge because intravenous (IV) thrombolysis achieves recanalization in only 4% to 32% of cases, depending on the site of occlusion. Treating tandem lesions with standard IV thrombolysis alone leads to good clinical outcomes in only 17% of cases, with a death rate as high as 55%. Because these lesions, in the setting of AIS, are therapeutically challenging (3), they are often excluded from randomized clinical trials (4-7). Moreover, tandem lesions are not common compared with isolated intracranial occlusion; patients with tandem lesions account for only up to 20% of participants in trials in which they are included.

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The HERMES meta-analysis of recent randomized AIS trials included only 122 patients with tandem lesions and demonstrated that endovascular treatment (EVT) is more beneficial than the standard treatment using IV thrombolysis with tissue plasminogen activator (tPA) (8,9). However, there is currently no consensus about the ideal technical interventional strategy for tandem lesions. Therapeutic approaches vary, especially regarding

treatment of the extracranial lesion. Some interventionists perform acute extracranial ICA stenting, whereas others prefer to perform only balloon dilatation. Alternatively, the extracranial ICA lesion may not be treated at all (10). There is also no agreement regarding the antithrombotic regimen, as the potential benefit of reducing ischemic complications with antithrombotic therapy must be balanced with the risk for reperfusion hemorrhage (10).

The principal aim of this study was to identify the best therapeutic treatment strategy for patients with AIS with tandem lesions by comparing the outcomes of different endovascular approaches in a large multicenter data pool consisting of 482 individual cases.

METHODS

PATIENTS AND SELECTION CRITERIA. Patients were pooled from 18 endovascular databases and included consecutive patients with AIS with tandem lesions of the anterior circulation treated with EVT. Among the participating sites were 6 centers in France, 5 centers in Germany, 3 centers in the United States, and 1 center each in Spain, Austria, Italy, and Denmark. Detailed materials have previously been reported (11). The study was approved by local Institutional Review Boards.

ABBREVIATIONS AND ACRONYMS

AIS = acute ischemic stroke
CI = confidence interval
EVT = endovascular treatment
ICA = internal carotid artery
IV = intravenous
mRS = modified Rankin Scale
mTICI = modified Thrombolysis in Cerebral Infarction
NIHSS = National Institutes of Health Stroke Scale
OR = odds ratio
sICH = symptomatic intracerebral hemorrhage
tPA = tissue plasminogen activator

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