



Current Therapies in Ischemic Stroke *İskemik İnmede Güncel Tedaviler*

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Stent-retriever Thrombectomy after Intravenous t-PA vs. t-PA Alone in Stroke

Intravenous tissue plasminogen activator (t-PA) treatment in acute ischemic strokes due to occlusions of proximal anterior intracranial circulation results in early reperfusion and functional independence in less than 50% of patients. Early interventions for endovascular thrombectomy showed low success rates but newly developed stent-retrievers were found to result in rapid reperfusion and decreased disability rates (1). Patients with stroke who received intravenous t-PA alone and who underwent endovascular thrombectomy with stent retrievers following intravenous t-PA within 6 hours were compared in an international, multi-center, prospective, randomized open trial (2). Patients with occlusion in internal carotid artery, first segment of middle cerebral artery or both and patients who had no large infarction in magnetic resonance imaging were included in the study. Only centers that performed at least 40 mechanical thrombectomies using at least 20 "Solitaire" stent-retrievers per year were included in the study. The primary outcome of the study was the severity of global disability at 90 days, as assessed by means of the modified Rankin scale. Secondary clinical outcomes were the rate of death at 90 days, the rate of functional independence (modified Rankin scale score, ≤ 2) at 90 days, and the change in the National Institutes of Health Stroke Scale/Score (NIHSS) at 27 hours after randomization. Reperfusion immediately after thrombectomy and successful reperfusion at 27 hours were the secondary outcomes, which showed the technical efficacy of the study. One hundred ninety-six patients underwent randomization (98 in each group) at 39 centers in the study and successful reperfusion was achieved in 73 of 83 patients (88%) following intervention. Thrombectomy treatment was associated with a favorable shift in the distribution

of global disability scores at 90 days ($p < 0.001$). The proportion of patients who were functionally independent at 90 days was higher in the intervention group (60%) than in the control group (35%) ($p < 0.001$). Likewise, the change in the NIHSS score at 27 hours and reperfusion rates were higher in the intervention group ($p < 0.001$, $p < 0.001$). Mortality at 90 days and rate of symptomatic intracranial hemorrhage did not differ between the groups ($p = 0.5$ and $p = 0.12$ respectively).

These findings confirmed and extended those of recent trials (3). The high reperfusion rate was proposed to be due in part to the more homogeneous patient population and the more homogeneous intervention in this trial than in earlier trials. The need for additional trials to delineate the effects of stent-retriever therapy in patients who are ineligible for intravenous t-PA, those who present more than 6 hours after symptom onset, and those with occlusions in the second segment of the middle cerebral artery or the posterior circulation was highlighted.

As a result, in patients with acute ischemic stroke due to large-vessel occlusion, emergency neurovascular thrombectomy with the stent retriever was safe and effective in achieving reperfusion, substantially reduced the degree of disability, and increased the proportion of patients with functional independence 3 months after stroke.

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Thrombectomy within Eight Hours after Symptom Onset in Ischemic Stroke

The clinical benefit of mechanical thrombectomy was recently shown in randomized prospective studies in ischemic stroke (1). The lack of consecutive enrollment was identified as a major shortcoming in these trials (2). In the "REVASCAT" trial, which used a concomitant, population-based registry of acute stroke reperfusion procedures, the efficacy and safety of thrombectomy in stroke treatment was investigated (3). Patients who could be treated within 8 hours after symptom onset were included in the study and were randomized into 2 groups: Patients who received medical treatment alone (including alteplase) and those who underwent endovascular treatment with the use of Solitaire stent retrievers following medical treatment. As in other trials, occlusion of proximal anterior circulation was shown in all patients and none of the patients had large infarction in neuroimaging. Endovascular intervention was performed in patients in whom intravenous alteplase treatment failed or was contra-indicated. The primary outcome of the study was the severity of global disability at 90 days, as measured using the modified Rankin scale. The secondary outcomes included centrally adjudicated infarct volumes on computed tomography (CT) or MRI at 24 hours, vessel revascularization on CT angiography (CTA) or MR angiography at 24 hours, early dramatic response to treatment (defined as a

decrease in the National Institutes of Health Stroke Scale (NIHSS) score of ≥ 8 from baseline or an NIHSS score of 0 to 2 at 24 hours), the NIHSS score at 90 days. Safety outcomes were the rates of death and symptomatic intracranial hemorrhage at 90 days.

Although 690 patients were planned to be included in the study, enrollment was halted after 206 patients were included because of positive results for thrombectomy were reported from other similar trials. As a result, thrombectomy reduced the severity of disability over the range of the modified Rankin scale (adjusted odds ratio for improvement of 1 point, 1.7; 95% confidence interval (CI): 1.05-2.8) and led to higher rates of functional independence (a score of 0 to 2) at 90 days (43.7% vs. 28.2%; adjusted odds ratio, 2.1; 95% CI: 1.1-4.0). Neurological improvement at 24 hours was better, infarction volumes were smaller and NIHSS scores at 90 days were lower in patients who underwent endovascular treatment. Additionally, the rates of symptomatic intracranial hemorrhage and death at 90 days did not differ between the groups. The findings of this study confirmed those of recent trials (1). Patients who responded to intravenous alteplase treatment early were excluded in this study. As a result, among patients with anterior circulation stroke who could be treated within 8 hours after symptom onset, stent retriever thrombectomy reduced the severity of post-stroke disability and increased the rate of functional independence.

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