

Emergent microsurgery in acute stroke patients after intravenous thrombolysis and mechanical thrombectomy failures: systematic review

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Background: Intravenous thrombolysis and mechanical thrombectomy represent a therapeutical standard in the treatment of an emergent large vessel occlusion in stroke patients. Despite the development of new endovascular devices, on average 10% of patients fail to achieve recanalization. Persistent occlusion of a large vessel is associated with poor outcome. The aim of this systematic review is to verify the safety and efficacy of microsurgical embolectomy and extracranial-intracranial bypass as a third-line treatment in cases of an emergent intracranial large vessel occlusion after failure of standard treatment. We also present the use of these microsurgical techniques in a case report.

Methods: We extensively searched eight sources of published and unpublished literature. We performed independently by two reviewers titles, abstracts, and full texts analyses. Then we performed critical appraisal and data extraction from selected studies using the standardised tools.

Results: The search identified eight relevant articles including a total of 12 patients with emergent large vessel occlusion (carotid terminus or middle cerebral artery) with standard treatment failure who underwent microsurgery within 24 hours from symptoms onset. Microsurgical embolectomy was performed in four cases, extracranial-intracranial bypass in five cases, their combination in two cases and manipulative intraoperative recanalization in one case. Functional independence (modified Rankin Scale 0-2) was achieved in nine patients (75%) at a 3-12 months after surgery evaluation interval.

Conclusions: Microsurgical embolectomy and extracranial-intracranial bypass appear to be safe and potentially effective thirdline treatments for selected patients with emergent occlusion of large vessels.