Predicting failure of acute stroke intervention

In 2015, several published clinical trials showed that acute stroke intervention with thrombectomy devices improved outcomes for patients with acute ischemic stroke. An analysis of individual patient data from 5 trials found that the chance for reduced disability at 90 days was substantially higher for patients with large vessel occlusion treated with endovascular therapy (odds ratio 2.49). The most commonly used thrombectomy device is known as a stentriever. In this issue of Neurology®, Baek et al. take an innovative approach by examining the precise site of vessel occlusion in relation to stroke etiology and the probability of treatment failure using stentriever devices. They recorded information on 259 patients treated with acute stroke intervention. The mean age of the patients was 70 years and 83% had potential sources of brain emboli, such as high-risk cardioembolic sources or >50% ipsilateral arterial stenosis.

The authors divided the angiographic pattern of occlusion into either a branching type (occlusion at an arterial bifurcation) or truncal type. The truncal type, defined as an occlusion in the mid-segment of the artery with clear visibility of all major vessel branches and its bifurcation site beyond the occlusion segment, were less common, accounting for 12% of angiographic occlusions. These patients less frequently had a potential embolic source, leading the authors to hypothesize that this pattern could reflect intracranial atherosclerosis. Presence of a truncal type of occlusion was also associated with a lower chance of stentriever success. Approximately 80% of branching type occlusions had satisfactory vessel recanalization, whereas only 18.2% of truncal type occlusions had early recanalization. Patients with truncal type occlusions more frequently required adjunctive therapies, such as stenting or use of glycoprotein IIb/IIIa inhibitors. Other predictors of stentriever failure included a history of hypertension or diabetes and an elevated C-reactive protein level.

This analysis provides potentially useful information for neurologists and neurointerventionists involved with acute stroke treatment. In the presence of a truncal type occlusion, the treating team may expect a more difficult path to recanalization and longer procedural times. Delayed recanalization predicts larger infarct volumes and worse neurologic outcome. Thus, patients with truncal type occlusion may require greater monitoring for stroke progression and edema development in the postprocedure period.

The current study has limitations, including its single-center nature. In addition, the use of nonstandard categorization as a truncal type occlusion or branching type precludes comparison with investigations in the pivotal endovascular trials, which did not include this information. Finally, other factors may alter stentriever success, such as the experience of the neurointerventionist.

Future studies should analyze the rate and predictors of stentriever failure in recent endovascular trials. The potential relationship of truncal type occlusion with intracranial atherosclerosis should be explored further in longitudinal studies of patients with intracranial atherosclerosis. Although the authors report that truncal type occlusions present more challenges, given the poor outlook for patients with acute stroke and proximal arterial occlusion, neurointerventionists need to find innovative ways to treat these types of vascular occlusions rather than avoiding such cases. The recent progress with acute stroke intervention is a remarkable story but it is worth a reminder that some patients still pose treatment challenges.

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REFERENCES


