Triage of Emergent Large Vessel Occlusion (ELVO) patients directly to Comprehensive Stroke Centers (CSCs) is good practice and benefits patients in Urban and Suburban population Centers – New insights from the TRIAGE-STROKE and RACECAT studies

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In 2013, three randomized controlled trials (RCTs) comparing the interventional management of stroke with intravenous (IV) thrombolytic therapy were simultaneously published in the New England Journal of Medicine.1–3 These trials showed neither benefit nor harm associated with endovascular stroke therapies and the widespread interpretation of their collective results can be summarized with the blanket statement that “thrombectomy is not effective for the treatment of stroke”. However, the SWIFT and TREVO studies (published in 2012) had clearly demonstrated that the interventional approaches used in the three RCTs were vastly inferior to contemporary thrombectomy techniques.4 5 Although this new generation of highly effective reperfusion therapies had become widely available by the time the negative trials were published, guidelines derived from the three negative trials did not endorse thrombectomy for stroke, which led to a drastic reduction (and in some regions a complete interruption) of the practice of thrombectomy. Fortunately, multiple RCTs were being conducted concurrently with these more effective second-generation devices and techniques. These newer studies conclusively demonstrated, in 2015, that thrombectomy is not only effective, but is one of the most effective interventions in medicine.6–10 firmly establishing thrombectomy as the standard of care for emergent large vessel occlusion (ELVO) patients. While this rapid course correction was fortunate, one can imagine how many ELVO patients were denied a procedure which could have markedly reduced their chances of living with significant disability in the interim. With this background in mind, it is important that we proceed thoughtfully and carefully when interpreting and acting on data from the recent RACECAT and TRIAGE-STROKE studies as they pertain to the critically important issue of the directed transport of ELVO patients directly to thrombectomy capable centers.

Combined analyses of the existing trials have unequivocally demonstrated that the benefits of the thrombectomy are heavily time dependent.11 To shorten the times to interventional therapy, stroke triage systems in some regions were reorganized to transport patients identified in the field with possible ELVO directly to comprehensive stroke centers (CSCs) or thrombectomy capable stroke centers (TCCs) rather than primary stroke centers (PSCs). Where implemented, these direct to CSC/TCC triage programs have consistently led to marked reductions in times to intervention without sacrificing access to IV thrombolytic therapy.12–16 Mohamad et al, reported improved outcomes, with higher rates of functional independence (62% vs 43%, odds ratio (OR) 3.08, confidence interval (CI) 1.08 to 8.78), for patients undergoing thrombectomy when they were transported directly to a CSC under a field triage system.12 Jayaraman et al, demonstrated that stroke patients with a Los Angeles Motor Score (LAMS) of 4 or higher, achieved functional independence in 68% of cases if transported directly to a CSC vs only 42% if first taken to a PSC.13 14 Similarly, Keselman et al, demonstrated that a direct to TCC triage policy for patients with suspected ELVO resulted in a significant reduction in morbidity, with 34.6% of patients undergoing thrombectomy reaching a modified Rankin Score (mRS) of 0–1 at 90 days after institution of the program vs 23.7% (OR 2.3, 95% CI, 1.4 to 3.6) during the previous years.15 16 Thus, an analysis of the existing “real-world” experience has been uniformly in favor of direct triage of patients with suspected ELVO to TCCs. In line with these data, the most recent American Heart Association guidelines endorse direct triage to CSCs for patients with suspected ELVO who are within 30 minutes of a CSC in urban areas, 45 minutes in suburban areas and 60 minutes in rural areas.17

Recently, two well designed, prospective RCTs – RACECAT and TRIAGE-STROKE – reported that they did not find a benefit for a direct to TCC triage program for ELVO patients. These concurrent and seemingly negative trials predictably led to immediate messaging proclaiming, without qualification, that direct triage programs are ineffective – “Latest TRIAGE-STROKE and RACECAT data put the brakes on alternative stroke transfer protocols” (NeuroNews, October 30, 2023). Even more troubling, these data are currently being aggressively and inappropriately applied to interrupt or prevent direct to CSC triage programs from being implemented in some areas. We will review each of these trials and their implications for direct to CSC triage programs in the United States and other similarly distributed population centers.

TRIAGE-STROKE

TRIAGE-STROKE is a prospective RCT comparing outcomes in tissue plasminogen activator (tPA) eligible patients with suspected ELVO triaged to the nearest PSC to those triaged directly to a CSC.18 Although the authors sought to enroll 600 patients, due to challenges with recruitment and issues related to funding, the study was terminated after only 171 patients (28.5% of the targeted
The median mRS score was 3 for each group. The study was stopped early for futility as the RACECAT is a truly negative study, indicating that there was no outcome benefit for a therapy, it should not be misinterpreted in a way that would harm patients by interrupting appropriate field triage. This poses a potentially grave risk to our patients, particularly in the US where PSCs themselves, and/or hospital systems which incorporate a number of PSCs, may be financially incentivized to interrupt direct to CSC triage policies which could adversely affect the volume of stroke patients delivered to their institutions. The misrepresentation and misapplication of these data, whether intentional or unintentional, to interrupt or prevent direct to CSC triage strategies...
in suburban and urban geographies would be directly harmful to ELVO patients who are at highest risk of disability with delayed intervention and carry the greatest opportunity for recovery from timely thrombectomy.

We should not repeat our previous mistakes.

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