

Endovascular acute ischemic stroke therapy

Society of Vascular and Interventional Neurology roundtable proceedings

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Over 15 years ago, the US Food and Drug Administration (FDA) approved the use of tissue plasminogen activator (tPA) for acute ischemic stroke (AIS) within 3 hours of symptom onset.¹ Since then, additional landmark advancements in AIS included the results of the Prolyse in Acute Cerebral Thromboembolism (PROACT) trial and the Middle Cerebral Artery Embolism Local Fibrinolytic Intervention Trial (MELT), which showed improved clinical outcome following local intra-arterial therapy, in comparison with placebo, and expanded the therapeutic treatment window of AIS.^{2,3} Because of the limited rate of recanalization by systemic and local chemical thrombolysis, mechanical thrombectomy became the next area of interest with the hope of achieving safer and faster recanalization. In the past decade, 4 major prospective studies of single-arm devices have yielded high rates of recanalization and FDA approval of 2 devices for thrombectomy.^{4–8} To take advantage of both early treatment initiation with systemic thrombolysis and the high rate of recanalization with endovascular therapy, the Interventional Management of Stroke (IMS) II feasibility trial evaluated the safety and potential clinical efficacy of this bridging approach.⁹ The results of IMS II set into motion IMS III, the largest randomized endovascular AIS trial to evaluate the efficacy of a combined intravenous and intra-arterial approach for the treatment of AIS. Although IMS III was halted due to preplanned interim analysis showing the very low likelihood of demonstrating a significant difference between the 2 treatment arms, data from IMS III may serve as a foundation for future endovascular AIS trials.

Despite advancements in AIS therapy, complex questions and considerable challenges remain for endovascular treatment. Patient selection is a critical element in achieving success and efficacy with endovascular therapy; however, our current understanding of the factors influencing patient selection is limited. Enthusiasm for imaging-based triage has prompted extensive investigation of this alternative approach to the conventional time-based model and may lead to improved patient selection. Advancements in device design are rapidly

evolving the next generation of technology for thrombectomy, which will demand rigorous appraisal of safety and efficacy. Institutional requirements and operator training are important elements that will need further definition, although considerable effort has already led to specific published recommendations to standardize endovascular stroke therapy performance training criteria and credentialing, as well as criteria for comprehensive stroke centers.^{10,11}

To review the current status of AIS knowledge, including the latest scientific evidence, important gaps in the current state of knowledge, common ground for practice standards, and the future direction of AIS endovascular therapy, the Society of Vascular & Interventional Neurology (SVIN) planned and funded a roundtable conference, held July 24–25, 2008, in Chicago, Illinois. In addition to vascular, critical care, and interventional neurologists, the group included 5 vascular neurologists and 2 neuro-intensivists, the majority of whom attended in person.

The moderated sessions were divided among these categories:

- I. Epidemiology and public health perspective on AIS endovascular therapy.
- II. Pathophysiologic basis of AIS endovascular therapy.
- III. Imaging in patient selection for endovascular therapy.
- IV. Therapeutics.
- V. Periprocedural management.
- VI. Future directions in endovascular management of AIS.

Time was dedicated at the end of each session for discussion. The question and answer session began with submission of polling questions relevant to the material presented. Results and relevant polling data are published in this supplement to introduce readers to the controversial questions and polling results. A total of 27 presentations were given by attendees of the roundtable meeting, and manuscripts were subsequently submitted and reviewed by the editors of the supplement. For topics not covered by the roundtable

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ble meeting presentations, invited reviews were written by experts in the field.

This endovascular AIS supplement provides a comprehensive overview of all aspects of stroke clinical care and current knowledge. This information is of importance in providing treatment and research guidance to practicing clinicians, basic scientists, clinical researchers, public health policy makers, and medical device and drug manufacturers.

AUTHOR CONTRIBUTIONS

Drs. Zaidat and Yavagal participated in the design, writing, and editing of the final version of the manuscript.

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DISCLOSURE

Dr. Zaidat serves on the scientific advisory board for Talecris; served on the adjudication committee for Stryker MAPS trial; received speaker honoraria from Stryker; serves on the editorial board of *Frontiers in Neurology* (Endovascular & Interventional Neurology Section); serves as an Associate Editor of *the Journal of Neurointerventional Surgery* and serves on the Editorial Board of *Journal of Stroke & Cerebrovascular Diseases*; served as a consultant for Stryker Neurovascular-Commercial, Codman Neurovascular-Commercial, Microvention Inc, Commercial; and has received research support from a Society of Vascular & Interventional Neurology (SVIN) grant for this educational activity. Dr. Yavagal received an honorarium from Penumbra Inc. for consultation and speaking; serves as an Associate Editor for *Frontiers in Endovascular Neurology*; and serves as a consultant to Penumbra Inc., Codman Neurovascular, Micrus Inc., Genentech, and Boston Scientific. **Go to Neurology.org for full disclosures.**

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