



## Úvodník | Editorial

## Acute stroke intervention: The heart of the matter

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Neurointerventionists first began treating acute ischemic stroke (AIS) in the early 1980s with wires and early thrombolytic drugs, like urokinase. Occasionally large-vessel occlusions reopened with spectacular clinical improvement. Patient volume was small; tools were crude; and results were sporadic. Early studies were unimpressive but some companies and physicians persisted. The first breakthrough was the approval of intravenous (IV) tissue plasminogen activator (tPA) in the mid-1990s after the positive results of the National Institute of Neurological Disorders and Stroke trial [1]. Subsequent development of the Merci device (Stryker, Kalamazoo, Michigan, USA) gave birth to the field of clot retrieval for acute ischemic stroke (AIS). However, the results of randomized studies published in the *New England Journal of Medicine* in late 2013 [2–4], using early interventional techniques and spanning many years, proved negative. The Multicenter Randomized Clinical Trial of Endovascular Treatment for Acute Ischemic Stroke in the Netherlands (MR CLEAN) [5] broke the impasse, was followed by four more positive trials reported in 2015 [6–9], and led the way to a new era in stroke intervention.

Excellent contributions by skilled experts in Professor Widimsky's special issue of *Cor et Vasa* point to the importance of a multidisciplinary approach to AIS. Stroke often originates in the heart, so comprehensive stroke centers should include cardiologists. The evolution of stroke intervention parallels that of cardiac intervention for ST-segment elevation myocardial infarction (STEMI) 2 decades later, and many lessons can be shared. The data are clear: stroke intervention must be performed as soon

as possible after symptom onset to optimize results. 'Time is brain' even more so than 'time is heart muscle'. As reimbursement for revascularization improves, technology offerings will rapidly leapfrog each other, making intervention for AIS much more rapid, easy, and efficacious. Intervention will be a brief interval in stroke treatment, and the diagnosis and appropriate postoperative care will be paramount to best outcomes.

Demographics mandate that stroke intervention take place as close to onset as possible. Well over half the population lives in rural areas where there are nearby cardiac catheterization laboratories but no comprehensive stroke centers with neurointervention capabilities. Interventional cardiologists are perfectly suited to perform stroke intervention. They spend most of their working hours opening stenosed or occluded arteries in the heart or periphery, with techniques and goals very similar to those for stroke intervention; whereas neurointerventionists spend most of their time coiling aneurysms, embolizing arteriovenous malformations, and treating other lesions in the brain. Thus, both specialties are ideally suited to perform stroke intervention. Postoperative care is critical and often best performed by neurospecialists.

A new and different paradigm may be needed to optimize outcome for AIS caused by large-vessel occlusion. Patients could be treated at the nearest catheterization laboratory, whether neuro or cardiac. Clinical and imaging diagnostic criteria for intervention can be standardized and easy to follow. Straightforward cases with good results in rural cardiac centers can be managed by cardiologists with help from neurologists. Cardiac-origin AIS can be

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DOI: 10.1016/j.crvasa.2016.02.014

evaluated and managed by the cardiology-neurology team locally. Complex cases can be transferred under standard protocol to comprehensive stroke centers for postoperative management after revascularization is accomplished.

Training of interventional cardiologists should be individualized, depending on the cardiologist's interest, experience, skill set, local multidisciplinary capabilities, and institutional appetite for collaboration. Cardiologists skilled in cervical access for carotid intervention will usually require minimal training. Our experience suggests that technical skills can rapidly be acquired in a neuro-interventional environment with hands-on experience in accessing the intracranial vasculature, familiarity with neurotechnology, and learning basic anatomy and physiology in a didactic setting. In essence, stroke intervention can be performed by anyone skilled in navigating and opening small arteries. The time required depends on the individual and the neurointerventional experience offered. A specific protocol is being developed and will be the subject of another publication. We hope this special issue of *Cor et Vasa* spurs cardiologists on to join in the treatment of AIS and that turf issues will not be allowed to interfere with the overarching public health benefits outlined above and throughout this issue.

#### Disclosure of financial relationships/potential conflicts of interest

Dr. Hopkins receives grant/research support from Toshiba; serves as a consultant to Abbott, Boston Scientific, Cordis, Covidien, and Medtronic; has financial interests in Boston Scientific, Valor Medical, Claret Medical Inc., Augmenix, Endomation, Silk Road, Ostial, Apama, Stim-Sox, Photolitec, ValenTx, Ellipse, Axtria, NextPlain, and Ocular; holds a board/trustee/officer position with Claret Medical, Inc.; and has received honoraria from Com-

plete Conference Management, Covidien, and Memorial Healthcare System.

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