



## Neurovascular Service: Acute Stroke Therapy

Stroke is the leading cause of serious, long-term disability with approximately 800,000 cases of stroke each year. It accounts for about 160,000 deaths, and in stroke survivors, there is a 25-29% recurrence rate over 5 years (4-14% annual rate). The American Stroke Association has developed the FAST program to identify signs of stroke. The Face, Arm and Speech Test can help identify acute changes which should alert a call to 911 for EMT assistance. It is important to get such patients to the hospital as quickly as possible. It is important to start therapy within three hours and consider an FDA approved clot dissolving medication called tPA. We can also consider an arterial procedure up to about six hours to remove the clot from the artery in the brain. In fact, these treatments can be used together in some patients.

The Interventional Neuroradiology/Endovascular Neurosurgery service participates in a multidisciplinary effort to prevent and treat acute stroke. We evaluate patients with our colleagues in MGH Stroke Neurology in the emergency room according to physical exam using the NIH stroke scale and clinical history. Non-contrast head CT is performed followed by a CT angiogram (CTA) to identify the blockage in the artery to the brain. We also obtain a brief MRI sequence to determine the amount of brain tissue injured at the start. We have designed criteria for these treatments and a parallel process work flow to quickly assess and treat patients.

In patients whom it is deemed safe, the procedure to remove the blockage from an artery to the brain is done in the MGH OR often using a stent-like retriever device. Catheter aspiration is often used separately or in combination with this technique. While IMS III and MR RESCUE Trials did not show clear benefit using older techniques, trials are underway with these newer generation of techniques. We are currently able to open 80-90% of arteries with these newer methods. Patients are then followed in the Neuro-intensive care unit and then in one of the area rehabilitation facilities to support recovery. We are able to help over 50% of our patients to return home in good or excellent condition in this otherwise devastating disease. Follow up primary medical care and specific stroke risk management is an ongoing process for patients

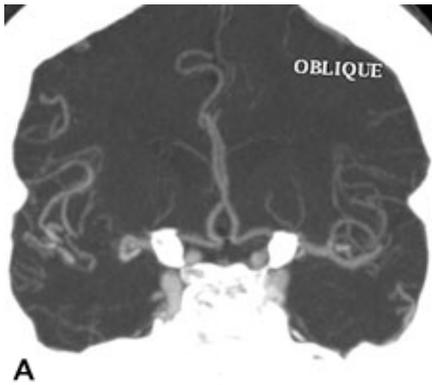
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**Interventional Neuroradiology Program, Neurovascular Service**

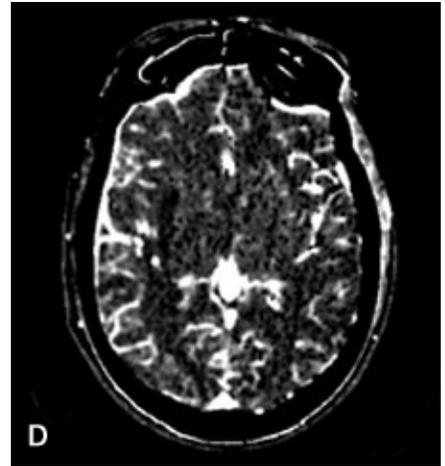
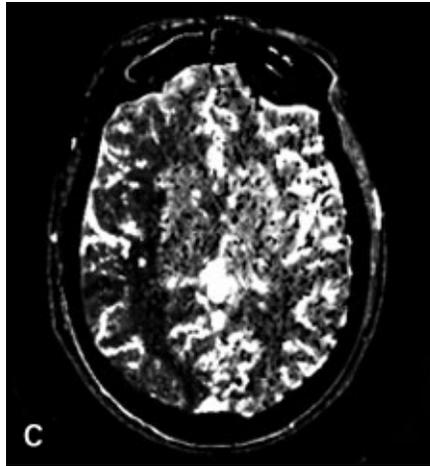
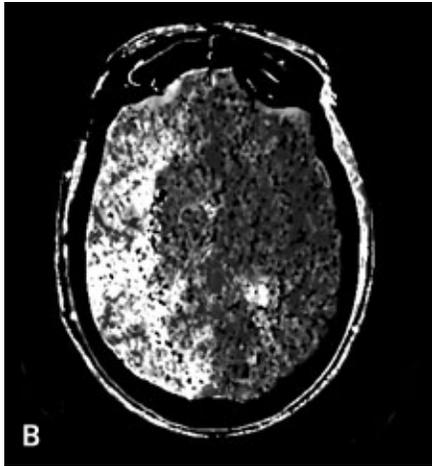
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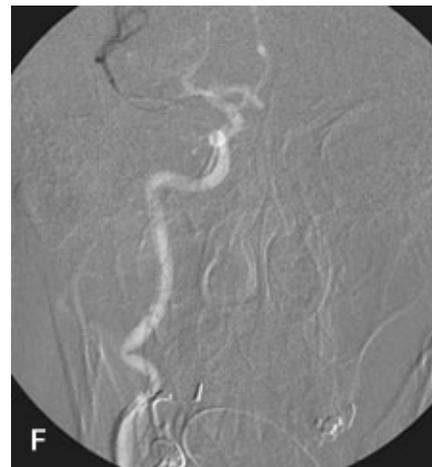
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(A) MRI of the spine shows edema in the spinal cord and an abnormal flow void along the posterior aspect of the cord on the T2 weighted sequence.



(B,C,D) CT perfusion images show decreased cerebral blood volume and cerebral blood flow with mean transit time representing ischemia.



(E) Initial angiogram shows the middle cerebral artery cutoff. (F) Road map angiogram shows the microcatheter crossing the clot before administration of tPA and microwire manipulation.



**(G,H)** Post thrombolysis angiogram in AP and lateral views show flow is re-established in the artery.  
**(I)** MRI with Diffusion weighted imaging shows a small region of infarct compared to the initial ischemic territory.

*The Neurovascular Service at Massachusetts General Hospital provides a multidisciplinary approach to patient care that combines neurosurgery, neurology and interventional neuroradiology. Based in the Department of Radiology, the Neurovascular Service's Interventional Neuroradiology Program uses minimally invasive procedures to treat a range of neurovascular disease and spinal disorders. For more information, visit [www.mgh-interventional-neurorad.org](http://www.mgh-interventional-neurorad.org)*

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