Adopting Mechanical Thrombectomy for Acute Stroke Intervention

Gerald Wyse, MD, discusses today's device options, the learning curve, and what interventionists adopting this therapy should know.

How steep is the learning curve for adopting mechanical thrombectomy options for treating acute stroke patients?

I think today's physicians are becoming much more adept, but the learning curve is still very steep. Some are hesitant or reluctant to attempt their first case, and it takes several cases to become proficient with the devices. But there have been improvements in the technology, and the overall experience has grown quite a bit, with physicians becoming more familiar with the devices they are using. There is definitely a significant learning curve, and I can't understate the importance of being mentored when you are first starting to use the device. Proper training is crucial.

Is it important to have proficiency with several available devices or to focus on perfecting the use of one option?

I strongly believe in having the whole arsenal on the shelf. The thing about thrombectomy at the moment is that there isn't a single perfect device. You need to have different options for certain cases. Some of the devices are more difficult to navigate intracranially, and in certain instances (such an elderly patient at a higher risk of atherosclerosis), there will be greater risk in using them. However, in another patient, they might be the ideal option. In our institution, we use the Merci (Concentric Medical, Inc.), Penumbra (Penumbra, Inc., Alameda, CA), and Ekos (Ekos Corporation, Bothell, WA) platforms. As the physician's experience grows, he will be happier to use one device versus another in particular settings, but I would certainly advise becoming proficient with each option and to always have the devices available.

> ". . . I would certainly advise becoming proficient with each option and to always have the devices available."

With this device-driven therapy, which is the more important factor—technique or technology?

I think they are equally important in this setting. These are relatively large devices, and if you have poor technique, and if you make even a small mistake in an intracranial vessel you are not very familiar with, you could have a disaster on your hands. We do not yet have the perfect technology. There is a lot of discussion about newer and next-generation devices on the way, which should facilitate the procedure, but the interventionist has to combine a careful, tailored technique with a specific device in a unique patient anatomy.

What is the window of efficacy for these devices in acute stroke?

In our institution, we essentially stick to the data shown in the previous clinical trials. We use Merci and the Ekos catheters up to 6 hours in the anterior circulation and the Penumbra up to 8 hours. However, no one really knows for certain that these time lines are correct.

For posterior strokes, the guidelines are not well defined, and you have to evaluate the factors of the clinical case. For instance, a patient with a basilar thrombosis has a dismal prognosis—about 80% to 90% mortality; in those cases, we will still attempt mechanical removal

even up to 24 hours. This is when the preprocedural magnetic resonance imaging is most important. When you are going beyond your normal limits, you really need physiological imaging with diffusion to prove that the brain distal to the occlusions is viable.

How would you describe a stoke patient who exemplifies a noncandidate for mechanical thrombectomy? In other words, which patients should not be treated with these devices?

Distal activity is a key determinant. If a patient has a large diffusion abnormality greater than one third of the middle cerebral artery territory, this is clearly a contraindication to using mechanical thrombectomy. Also, patients with severe underlying atherosclerotic disease will pose difficulty in navigating the devices. In those cases, it is far easier to go up with your smallest microcatheter and administer tissue plasminogen activator.

Should these devices be available for use in every hospital, or only those with designated stroke teams or physicians?

These devices should be available only to those with designated stroke physicians. If you are not familiar with mechanical thrombectomy devices and if you are not using them frequently, you will run into significant problems when you try to use them. They are not very straightforward, and you certainly need training and adequate experience with them to ensure good outcomes.

What advice would you offer an interventionist who is interested in treating acute stroke patients?

Before performing any procedures, become familiar with the mechanics of the device and the available data. Contact your local industry representative to see if they can help you meet with a physician who is regularly using mechanical thrombectomy, and get some significant real-life experience under the guidance of a proctor before attempting to perform the procedures yourself. ■

Gerald Wyse, MD, is with the Department of Interventional Neuroradiology at Johns Hopkins University School of Medicine in Baltimore, Maryland. He has disclosed that he holds no financial interest in any product or manufacturer mentioned herein. Dr. Wyse may be reached at (410) 955-8525.