Iliac Artery Thrombolysis Techniques

Amir Motarjeme, MD, discusses the indications and devices for thrombolytic therapy.

Which patient presentation signals ideal candidacy for iliac thrombolysis?

The ideal candidate for iliac artery thrombolysis, like any other artery, is a patient with acute or subacute thrombosis. On the other hand, many long-segment aortoiliac occlusions are commonly associated with some degree of arterial thrombosis. Chronic iliac artery occlusions, just as any other large artery, are more responsive to thrombolysis than arteries of smaller caliber. It has been shown that 55% of all iliac artery occlusions show complete clot lysis when treated with thrombolysis. Thrombolysis, in particular, is effective in long-segment occlusions; it reduces the length of occlusion and in some cases uncovers the primary lesions such as high-grade stenosis or a short-segment occlusion. Of course today, having more recanalization tools, stents, and stent grafts, thrombolysis is less needed, except for acute occlusions.

What would indicate that a particular patient is not a candidate?

Short-segment iliac artery occlusions having an angiographic appearance of chronic occlusion (well-established collateral arteries), especially common iliac arteries, do not respond to thrombolysis. This is particularly true when the primary atherosclerotic lesions are located at the proximal end of the occlusions. This can be learned by observing the opposite iliac artery because the atherosclerotic lesions in the peripheral arteries are mirror images; for every stenosis on the right, there is one on the left side and vice versa. There are, of course, absolute contraindications for thrombolysis such as history of recent cerebrovascular accident, abdominal surgery, and gastrointestinal bleeding.

How would you describe your preferred technique for thrombolysis in this anatomy?

For unilateral iliac artery occlusions, a contralateral femoral approach is used for diagnostic angiography and thrombolysis. I have designed a special catheter, a variation of a Simmons catheter, for lytic therapy of the iliac arteries via a contralateral approach (5-F Motarjeme [MOT] Softouch catheter [Merit Medical Systems, Inc., South Jordan, UT]). This catheter can be hooked into the occluded common iliac artery. For occlusion of the external iliac arteries, a Sos wire (Medtronic, Inc., Minneapolis, MN) can be inserted through this catheter to reach the occlusion. With sideholes, this catheter can also be used for coaxial infusion. In the case of occlusion of the aortoiliac segment, a brachial approach is used. A long sheath is placed in the abdominal aorta, and a straight coaxial catheter system is used for thrombolysis. The patients are usually seen in 4 hours to ensure the proper position of the catheter and progress of the lytic therapy. Thrombolysis is continued overnight, and the patient is seen again the next morning.

What type and dosage of lytic do you administer? What is the duration of lytic administration?

The most favorable lytic agent, urokinase, is no longer available in the United States. Current agents in clinical use are alteplase (tPA), reteplase (rt-PA), and tenecteplase (TNK). The dosages are 0.25 to 1 mg/hour for tPA, 0.25 to 1 IU/hour for rt-PA, and 0.125 to 1 IU/hour for TNK. The duration of thrombolysis for iliac artery occlusions is usually limited to 24 hours.

Do you use anticoagulation in addition to lytics? If so, what is your protocol? Which contraindications do you watch for?

Heparin is being used concomitantly but at a much lower dosage than urokinase. The recommended dosage is usually 500 to 800 IU/hour. I use tPA at 1 mg/hour for single-port, coaxial infusion or along with ultrasound, as in the case of Ekos ultrasound catheters (Ekos Corporation, Bothell, WA).

How do you decide between device options?

The device options depend on the type of occlusions. If the occlusion can be crossed, we prefer using Ekos ultrasound catheters. There are other sidehole and endhole catheters along with injectable wires that can be used.

Which imaging modalities are used in these cases at your facility?

Imaging varies from ultrasound in the form of Doppler and duplex sonography, x-ray imaging (computed tomographic and conventional angiography), and magnetic resonance imaging. Conventional angiography is used at the time of thrombolytic therapy.

Do you employ the AngioJet Power Pulse option (Medrad Interventional/Possis, Indianola, PA) in these cases?

I personally do not use the Power Pulse technique. For mechanical thrombolysis, I prefer standard AngioJet.

Which other devices should the interventionist have in the room?

AngioJet thrombectomy catheters are very helpful for removal of the residual clots after 24 hours of thrombolysis. Recanalization devices, especially Glidewire (Terumo Interventional Systems, Inc.) and Quick-Cross catheters (Spectranetics Corporation, Colorado Springs, CO), are commonly used for recanalization at our lab. An interventionist should also have stents and stent grafts available in various sizes. Although we use lasers for recanalization of the femoral popliteal segments, we do not feel comfortable using them in the iliac arteries.

When is it best to use lytic therapy alone versus percutaneous transluminal angioplasty and stenting?

Some of the iliac artery occlusions are due to arterial emboli, and complete thrombolysis negates the need for percutaneous transluminal angioplasty and stenting.

What is your postprocedural protocol? What are your schedule and methods for long-term follow-up?

We prescribe 75 mg/day of clopidogrel and 81 mg/day of aspirin permanently. Our patients are routinely seen at the office 4 to 6 weeks after the procedures and 3 to 6 months thereafter, at which time duplex sonography and ankle-brachial index tests are done routinely. Because arterial atherosclerosis is a systemic disease and most of the patients have recurrence in the same or other arteries, they are not discontinued from follow-up unless they move out of our territory. ■

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