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CASE REPORT

Single-Setting Treatment for Iliac DVT

BY ROBERT J. MEISNER, MD, FACS, AND VINCENT DIGIOVANNI, DO, FACOS, RPVI

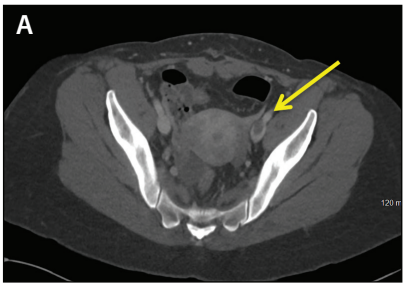
A 45-year-old African American woman presented to the emergency department with an approximately 1-week history of left thigh swelling and left-sided pelvic pain. She had undergone an abdominoplasty operation 2 months prior that was otherwise uncomplicated. The emergency department staff performed an abdominal and pelvic CT scan with IV contrast. They diagnosed a left-sided iliac vein thrombus based on the CT scan (Figure 1).

The patient travels for work with intermediate-length flights, and she had traveled twice in the previous week. Otherwise, she did not have any risk factors for deep vein thrombosis (DVT)—no prior DVT and no family history of hypercoagulability. The relatively recent surgery may have contributed as well. The CT of the pelvis suggested a typical May-Thurner compression physiology at the level of the proximal left iliac vein (Figure 2); the thrombus was in the associated area and distal to that compression point.

The emergency department started the patient on IV heparin and admitted her to the hospital at that time; she was admitted in the early morning around 5:00 AM. We kept her on nothing by mouth and added her on the procedural schedule in the hybrid operative suite.

TREATMENT TECHNIQUE

The patient was brought into the hybrid OR in the afternoon of the same day. Local anesthesia and conscious sedation was planned for and used. She was placed in a prone position, and the left popliteal fossae was prepped and draped. The left popliteal vein was visualized and cannulated with ultrasound guidance, and we upsized immediately to an 8-F sheath. Peripheral left femoral-popliteal venogram demonstrated no thrombus in this segment (Figure 3). An angled hydrophilic catheter was advanced proximally, and the left iliofemoral segment showed partial density filling of the vein at this segment (Figure 4). Over a stiff hydrophilic guidewire, we advanced an 0.035-inch digital intravascular ultrasound (IVUS) catheter. The IVUS images revealed a nearly occlusive thrombus occupying the majority of the lumen of the left external iliac and mid-iliac vein; the proximal common iliac vein showed a tapered tongue of thrombus extending to a drastically compressed proximal left common iliac vein. There appeared to be a double compression, where both the left and the right common iliac arteries were visualized as culprit compressive entities (Figure 5).



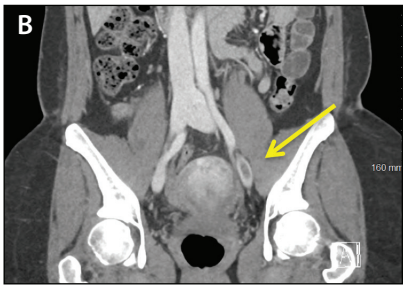


Figure 1.

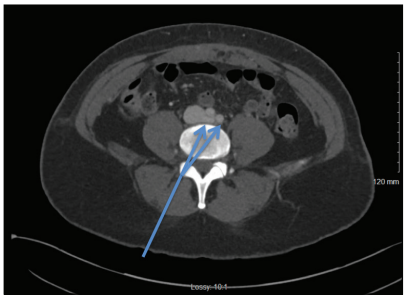


Figure 2.

Figure 3.

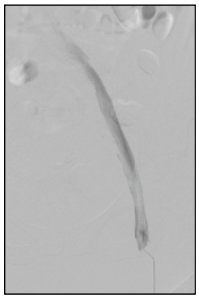


Figure 4.

Ten milligrams of tPA alteplase was prepared in a 100 mL bag of normal saline. The 8-F AngioJet™ ZelanteDVT™ (Boston Scientific Corporation) catheter was loaded over the wire. We used the thrombectomy mode first for < 20 seconds along the length of the thrombus. We then transitioned into Power Pulse™ mode and pulsed all 100 mL (10 mg) of the tPA into the thrombotic segment. We then waited for 30 minutes.

After 30 minutes, we went back in with the ZelanteDVT catheter in thrombectomy mode. We performed thrombectomy for between 220 and 230 seconds and then

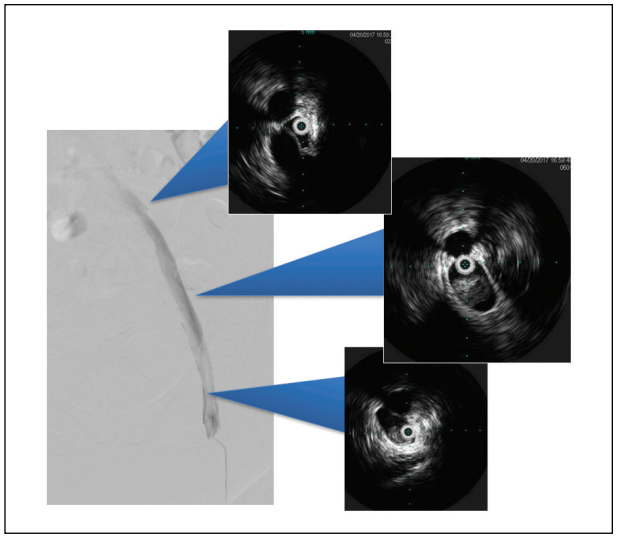


Figure 5.

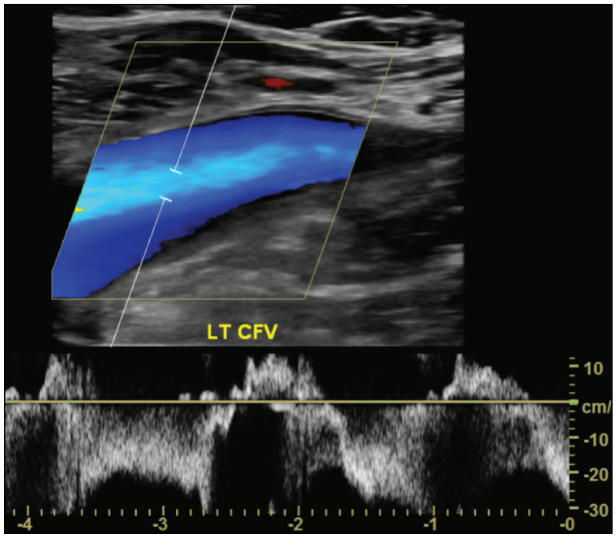


Figure 9.

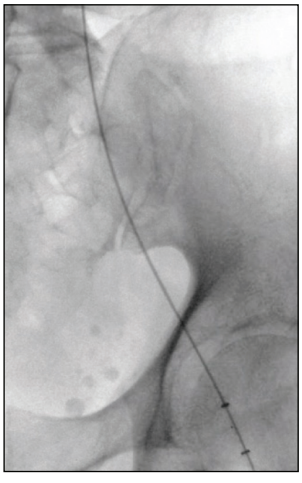


Figure 6.

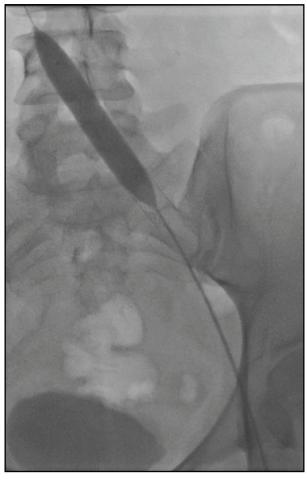


Figure 7.

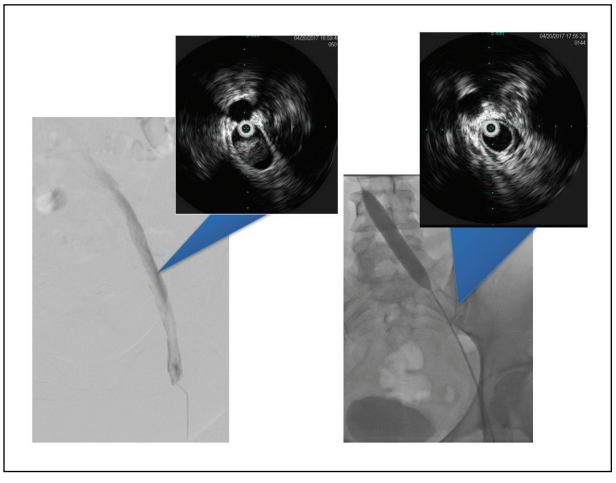


Figure 10.

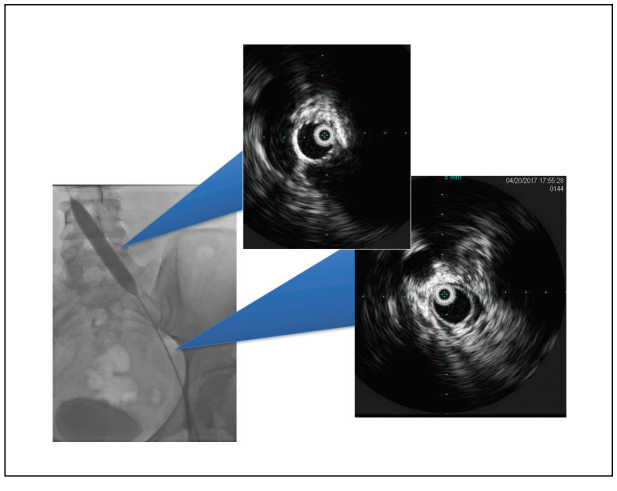


Figure 8.

reevaluated with IVUS. Traditional venography would not be sensitive to residual thrombus. There was posterior residual thrombus seen in the left common femoral vein. We utilized the directionality of the ZelanteDVT catheter, rotating the window toward the area of residual posterior thrombus and repeating the thrombectomy action for an additional 10 to 20 seconds.

We were satisfied to see the thrombus responded very well to the treatment; it was completely thrombus-free after therapy. We did make anatomic notes about the extensive compression using the IVUS catheter at this point. We up-sized to an 11-F sheath over a Magic Torque™ guidewire (Boston Scientific Corporation). We used a self-expanding stent extending from the inferior vena cava to the mid-left iliac vein and postdilated the stent with an angioplasty balloon (Figure 7).

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We used IVUS to reevaluate the anatomy after intervention (Figure 8). We found that in this case, there was essentially very little use in repeating digital-subtraction venograms; the sensitivity to identify partially occlusive thrombus and compression is low with venogram only. Instead, our practice has been to use IVUS imaging exclusively. In fact, we completed this case in under 90 seconds of total fluoroscopy time.

The wires, catheters, and sheaths were removed, and manual pressure was held. Elastic bandages were used, and the patient was put on bedrest for 3 hours. She was given clopidogrel (300 mg) and aspirin (81 mg) in the post-anesthesia care unit. She was fed dinner and prior to discharge was started on a 21-day loading dose pack of rivaroxaban and given a script for 20 to 30 mm Hg gradient compression garments. She was discharged in the early evening on the same day as her admission.

At 1-month follow-up, ultrasound imaging showed patency of her iliac stent (Figure 9).

CONCLUSION

The size and utility of the ZelanteDVT catheter has given us greater ability to treat patients in a more thorough and complete manner even in a single interventional setting. The directionality feature is a nice update over previous generations of catheters, and it is useful for more organized residual thrombus. We have also found that first running the catheter relatively quickly through the thrombus on thrombectomy mode, then going to Power Pulse mode, waiting, then performing a final thrombectomy run, we have a more useful debulking of the thrombus. We would reemphasize the need to use IVUS as the primary imaging modality in directing therapy through these cases and not to use it intermittently. ■

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Disclosures: None.

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