Special Considerations for Recurrent DVT Cases

Restoring patency in these challenging situations.

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Interventional management of recurrent deep vein thrombosis (DVT) may pose a more challenging scenario than the initial episode, with respect to both the technical approach and postprocedural management. These patients fall into two groups that have similarities as well as differences: those who have not undergone a previous interventional procedure and those with a history of endovenous intervention for DVT. Each group poses unique challenges to interventionists. In both groups, clinical and imaging assessment should be geared toward addressing the causes of recurrent DVT and determining the extent of venous thrombosis and/or obstruction.

PATIENTS WITHOUT PREVIOUS INTERVENTION

In patients with recurrent DVT and no history of endovenous intervention, acute-on-chronic thrombosis in one or more venous segments may be present. This knowledge is important in determining the eligibility of the patient for an intervention and planning the procedure.

If sonographic images are consistent with acute thrombosis of the proximal venous segments, the interventional approach would be similar to a patient with first-time acute DVT: catheter-directed thrombolysis and/or pharmacomechanical lysis. This step is then followed by stenting of the underlying obstructive lesions in the iliofemoral segments, if necessary (segments cephalad to the saphenofemoral junction). Stenting of obstructive lesions in the femoral or popliteal veins has not shown good outcomes and should be avoided. Patients with occluded or partially recanalized femoropopliteal veins are at an increased risk of exhibiting signs and symptoms of postthrombotic syndrome (PTS), for which there is currently no cure. The recommended management consists of anticoagulation and graduated compression stockings.

Underlying obstructive lesions of the iliofemoral segments should be treated by angioplasty and stenting, thus restoring outflow and reducing the risk of PTS. In patients with concomitant above and below saphenofemoral junction disease, flow restoration in the proximal segments may not entirely prevent PTS, but will likely diminish the risk and magnitude of symptoms if it occurs.

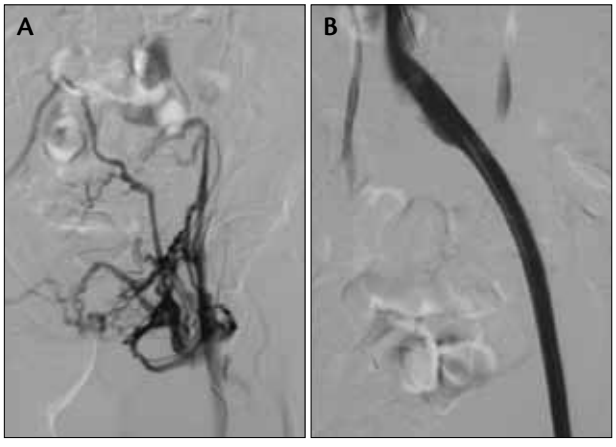

Figure 1. Left lower extremity venogram in a 19-year-old female patient with recurrent DVT after an overnight infusion of tPA (A). Femoral vein was cleared of thrombus, but there is chronic occlusion of the iliac venous segment with multiple collateral channels (B). In order to recanalize the iliac veins, selecting the correct path is critical.

Chronic occlusions of the iliofemoral segments, however, can pose a technical challenge; they are typically fibrotic channels that can be very difficult to penetrate and cross. This scenario is further complicated if the operator is not familiar with the recanalization of chronic venous occlusions. The correct course of the occluded vein may be hard to recognize for the uninitiated, leading to either failure to cross or the extravascular passage of the wire with low likelihood of reentry. Furthermore, smaller collaterals that do not lead to the target lumen or cannot tolerate large balloon angioplasty may be wired inadvertently (Figure 1).

TABLE 1. COMMON CAUSES OF RETHROMBOSIS AFTER ENDOVENOUS INTERVENTIONS IN THE DEEP VENOUS SYSTEM

1. Thrombophilia
    a. Acquired or inherited thrombophilic conditions
    b. Tumor invasion of the vein (stent grafts should be used in the involved segment after clot clearance)
2. Poor inflow after the intervention
    a. Use of pharmacomechanical lysis devices only when access vein is thrombosed
    b. Inadequate dose or distribution of thrombolytic drug
    c. Presence of subacute or chronic clot in the inflow veins
3. Poor outflow after the intervention
    a. Residual untreated thrombus
    b. Suboptimal thrombolysis in acute DVT
    c. Suboptimal PTA/stent in chronic occlusions
    d. Uncorrected venous compression
4. Suboptimal anticoagulation
5. Noncompliant patient
6. Suboptimal transition from heparinoids to oral anticoagulants
7. Presence of IVC filter
8. Duplicated femoral vein

Employing sharp recanalization techniques using one of the transvascular needles or the back end of a hydrophilic wire may become necessary in these cases; this requires a certain degree of comfort that only comes with experience. For these reasons, the success rate of restoring patency to chronically occluded fibrotic veins may be low. Next to experience, patience and persistence are the other two key operator traits that improve the likelihood of success.

Figure 2. Right lower extremity venogram in a 58-year-old woman with a history of DVT. There is chronic thrombosis of her popliteal and femoral veins. This is a more challenging clinical scenario than chronic occlusion of the iliac veins.

PATIENTS WITH PREVIOUS INTERVENTION

The second group of patients with recurrent DVT, those with a history of intervention, requires additional considerations. The majority of the failures of endovenous interventions after an episode of DVT occur early (during the first 30 days after intervention), suggesting a thrombotic etiology rather than tissue proliferation. Therefore, the causes of rethrombosis have to be sought and addressed. Table 1 lists the most common causes of rethrombosis after endovenous interventions for DVT.

Intervention in these patients may often be more challenging than those patients who have not previously undergone DVT procedures due to the delay in diagnosis of recurrent DVT. This is a common scenario, because both the patient and the referring or treating physician may miss the signs and symptoms of recurrent DVT early after an intervention, and routine early ultrasound is not usually done in asymptomatic patients.

Rethrombosis that may have been caused by poor outflow after the initial intervention should be managed first by effective removal of clot, followed by angioplasty and stenting to establish adequate outflow. The most frequent causes of poor outflow are suboptimal resolution of thrombus after the initial intervention or leaving underlying obstructive lesions untreated. The enthusiasm of some operators to treat acute iliofemoral thrombosis in a single session by pharmacomechanical methods predisposes patients to the former.

Inflow problems, however, are more difficult to deal with. By the time a second intervention becomes neces-

sary, the clot in the inflow veins, which may date back to the initial episode of DVT, is likely organized and resistant to lysis (Figure 2). Because PTA and stenting are largely ineffective in such peripheral veins, these patients often have no good solutions except for treatment with anticoagulation and compression stockings. We usually attempt to re-treat these patients by removing the acute component of the clot and establishing outflow when possible. It should be kept in mind that outflow veins will only stay patent if there is adequate inflow into them.

To improve the chances of adequate inflow into the main deep venous system, it is best to achieve the initial venous access in the most peripheral accessible point that leads to the thrombosed deep veins. Superficial veins draining into the popliteal vein or high posterior tibial vein are examples of such access points. If access into a clotted vein is achieved (eg, a thrombosed low popliteal vein), catheter-directed thrombolysis is the best initial method of clearing the clot.

Another group that deserves some comment here are those with thrombosed IVC filters. In such symptomatic patients, the acute clot can be removed using catheter-based techniques as mentioned previously. Underlying occluded segments, including chronically thrombosed filter, if present, can then be stented to provide outflow. Postprocedurally, these patients will require carefully managed optimal anticoagulation, because they are prone to thrombosis and will have no caval protection if deep venous thrombosis recurs.

CONCLUSION

The interventional management of patients with recurrent DVT is a more challenging problem than in those with first-episode DVT. The interventional emphasis on these patients should be to reestablish maximal flow through as many thrombosed segments as possible. Once patency is reestablished, proper anticoagulation and search for and treatment of the underlying causes of recurrent DVT are mandatory. ■

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