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Case Report

Post-Thrombotic Syndrome: The Disabling Story of Deep Vein Thrombosis

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Abstract

Post-Thrombotic Syndrome (PTS) encompasses the signs and symptoms of the lower extremities that affect patients after Deep Vein Thrombosis (DVT). It is a difficult disease to manage and requires multiple avenues of prevention. Currently the benefit of thrombolysis for DVT is being investigated and along with compression therapy is one of our options for treatment to prevent the development of PTS, but even with the best of care it is not always effective. We report a case of a 37 year old male with multiple unprovoked episodes of iliofemoral DVT who underwent catheter directed thrombolysis, but was noncompliant with compression. He has an 11 year follow-up resulting in bilateral skin changes and ulceration in left limb.

Introduction

Venous Thromboembolism, a term encompassing Deep Vein Thrombosis and Pulmonary Embolism is estimated to affect between one to two in a thousand people in the United States annually. The DVT patients develop post thrombotic syndrome around half of the time. In terms of disability recently it was shown that DVT and PTS results in a more significant longstanding disability [1]. The estimated increased cost per year to treat PTS is around $5000 [2]. We present a clinical case with 11 year follow-up addressing most issues with DVT and PTS.

Case History

A 37 year old male construction worker who smokes but with no previous medical history presented to SBUH four weeks after the diagnosis of unprovoked right lower extremity Deep Vein Thrombosis (DVT) at an outside hospital. The patient had been placed on therapeutic anticoagulation which subsequently failed to resolve his swelling and discomfort. The patient underwent a right lower extremity venogram via popliteal approach which revealed complete occlusion of the popliteal vein to the iliac vein. Mechanical and pharmacologic thrombolysis was then performed with the angio-jet to pull a spray of 250,000 units of Urokinase. The mechanical thrombectomy was performed with the angio-jet system after waiting thirty minutes (Figure 1A & B). Due to the significant improvement in the thrombus burden with good flow no further intervention was pursued (Figure 1C).

The patient was anticoagulated with unfractionated heparin and bridged to Coumadin with an INR between 2-3. He was discharged on 10mg of Coumadin a day, but returned to SBUH three days later with a painful swollen right leg. The patient is a reliable historian and his INR on admission was 2.4. Ultrasound of the extremity revealed acute thrombosis of the right iliac, femoral, popliteal and peroneal veins. A CT scan was performed the following day showing a right sided intraluminal thrombus involving the common femoral vein to the level of the common iliac vein confluence (Figure 2) and no abnormality of the IVC.

He returned to the operating theater and a retrievable filter was placed from a left femoral approach due to failure of previous intervention and anticoagulation. A venogram performed from the right popliteal vein which showed recurrent thrombosis of the femoral segment to iliac (Figure 3). A thrombolysis catheter was placed and TPA drip initiated at 1mg/hr.

He returned to the operating theater 6 hours later for repeat venogram which showed a good result in the femoral popliteal segment. The iliofemoral vein still had some residual thrombus (Figure 3A) which was resistant to the thrombolysis so a venoplasty and stent placement was performed (Figure 3B). Two 14 mm x 60 mm wall stents and a 12 mm x 40 cm wall stent were deployed in the common iliac, external iliac and common femoral veins respectively (Figure 4). Post-stent placement venogram showed excellent flow up into the iliocaval system. There was still some thrombus in the distal common femoral and proximal femoral vein and an infusion catheter was left in place overnight.

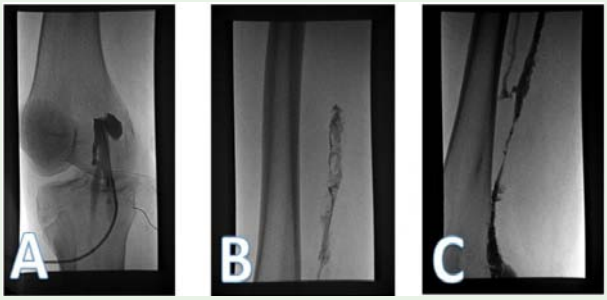

Figure 1: A) Thrombosed Femoral-Popliteal segment B) Femoral extension of thrombus C)Post-intervention/Completion venogram.

Figure 2: Right iliac thrombus shown (Arrow).

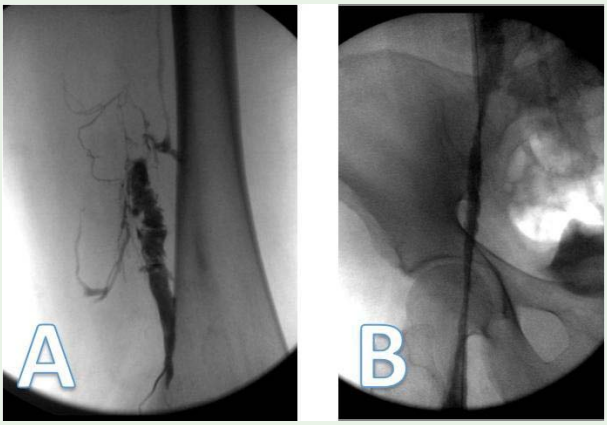

Figure 3: Recurrent thrombosis of femoral-iliac segment.

The following morning repeat venogram showed good flow up into the femoral popliteal segment and the iliocaval system. There was still some residual thrombus in the distal common femoral as well as femoral vein. We advanced the catheter again up and repeated our percutaneous mechanical thrombolysis in this area and after doing this for about 10-15 minutes the venogram showed complete resolution of the thrombus. The sheath was left in place with a thrombolytic infusion until the patient was fully anticoagulated and it was pulled out in the recovery room. The patient was discharged on fondaparinox and returned the following week for IVC filter removal. He remained on fondaparinox indefinitely and followed up with his hematologist.

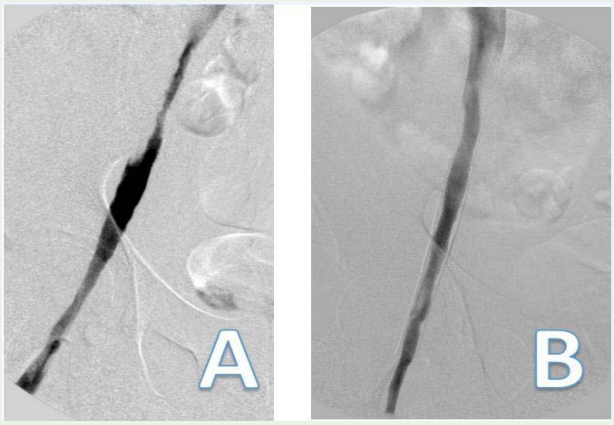

Figure 4: A) Iliac vein post Thrombolysis B) Iliac vein after stent placement.

Three years after initial diagnosis he returned to SBUH with left lower extremity DVT which was incidentally found on MRI after a knee injury and venous duplex showed popliteal, common femoral and iliac vein DVT. He was also noted to have phlegmasia so it was decided to perform a venogram from popliteal approach which revealed the femoral-popliteal thrombus which could not be crossed. A thrombolysis catheter was placed and after pulse spraying 5mg of TPA it was left to drip at 1mg/hr for 6 hours. When the patient returned to the OR the femoral-popliteal thrombus was successfully crossed and venogram showed the IVC and proximal iliac vein were patent. Thrombus was identified from the iliac vein down the common femoral and femoral veins. An isolated pharmomechanical thrombolysis was performed using the trellis device and 5mg of TPA which resolved all but a significant residual thrombus in the common femoral and external iliac veins. An infusion catheter was left in place and thrombolytic infused overnight (Figure 5).

Venogram the next morning showed most of the thrombus in the common femoral had resolved, however some thrombus remained in the iliac vein (Figure 5). It was decided to stent this area with a 16 mm x 60 mm stent. Venogram after stent placement showed rethrombosis of the femoral popliteal segment. Thrombolytic infusion

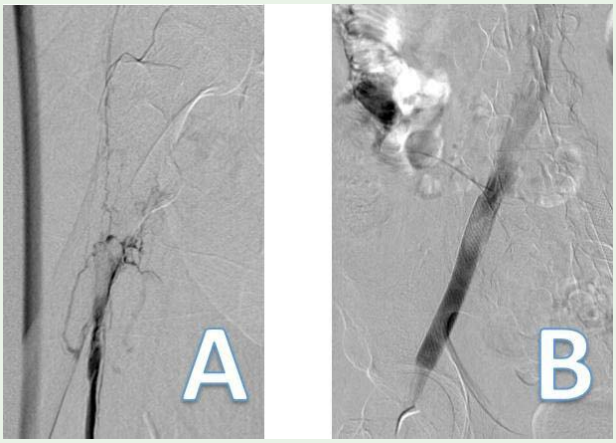

Figure 5: A) Post thrombolysis showing residual femoral iliac thrombus B) Post stenting showing flow into the cava.

using a catheter was attempted for another 48 hours. Venogram 2 days later showed no residual thrombus and patient discharged on fondaparinox.

He remained asymptomatic, on fondaparinox and followed up with his hematologist however discontinued using his compression stockings. A surveillance venous duplex performed 4 years ago showed there was chronic non-occlusive deep vein thrombosis noted at the right popliteal vein. Reflux was noted at the right popliteal, femoral, deep femoral and common femoral vein. The right external iliac vein stent was patent with no evidence of thrombosis. Duplex study of the left lower extremity showed there was chronic non occlusive deep vein thrombosis noted at the left common femoral, femoral and popliteal vein. There was chronic occlusion noted at the left mid to distal external iliac vein stent. Due to the patient being asymptomatic no intervention was performed (Figure 6).

Figure 6: A) Ulceration on presentation B) After compression therapy for 4 weeks.

as unprovoked DVT or iliofemoral these patients continue to remain hypercoagulable, commonly have failure of prophylactic anticoagulation and repeat VTE is common [7]. Finally, since he suffered recurrent DVT, this increased his risk of PTS [8].

In this patient's initial presentation catheter directed thrombolysis was the correct approach. Recently published research supports catheter directed thrombolysis in DVT with acute femoral-popliteal DVT with iliofemoral DVT showing improved patency, less PTS and less valvular reflux [9]. A fault in management could be seen in not initially stenting the patient and then after rethrombosis not choosing a larger stent. This case was early in our experience of venous stenting, IVUS was not yet commonly in use and an incorrect decision was made. It should be noted that though the right side was stented with 12 and 14mm stents it remained open while the left side stented with a 16mm stent is the side that became occluded. Prior to placing a stent good inflow must be present. In case of poor inflow endophlebectomy may be performed or a creation of an arteriovenous fistula to maintain adequate flow and stent patency [10].

Intervention in the hopes of avoiding PTS is becoming more common and building support. Motivating factors include the increased cost of caring for PTS and the disability caused by it. The costs can become significant with patients who suffer VTE without subsequent PTS having annual cost of $15,800 while having PTS increases the cost to $20,600 [2]. In relation to disability, patients with VTE have been noted to have an increased risk of work related disability of 37%, while DVT risk is increased to 54% [1].

Elastic compression stockings have been used to treat the acute signs and symptoms of DVT and also to prevent PTS [11,12]. Most studies have demonstrated benefit in compliant patients but this can be an issue in long term use. As the patient did not come to see us for a period of 4 years possibly he could not have been compliant with this compression and anticoagulation (Figure 7).

Figure 7: Timeline.

Four more years passed until patient presented this year to the outpatient office complaining of infected right calf ulcer. He had remained non complaint with compression. The right leg had chronic post thrombotic lipodermatosclerotic skin changes, scattered 4-6 mm varicosities and a sub centimeter area of open ulcer (Figure 6A) making him $C_6E_SA_DP_O$. There was surrounding erythema on the right distal medial calf with purulent material expressed. Venous duplex performed showed no deep vein thrombosis, low flow in external iliac vein stent and post-thrombotic changes. Patient completed a course of antibiotics and the ulcer healed with unna boot dressings.

Discussion

This case represents a common experience in patients who eventually develop PTS. First, he suffered an unprovoked DVT. Those who suffer an unprovoked DVT are more likely to suffer a second DVT [3,4]. Second, the DVTs he experienced were Iliofemoral which has both a higher recurrence rate and association with PTS and venous claudication [4-6]. He also reported two first degree relatives diagnosed with Factor V Leiden. Potentially he suffers from Factor V Leiden as well and though not as strong of an influence

Conclusion

This is a case of a patient who suffered multiple episodes of DVT, underwent several thrombolysis and stenting, and was lost to follow-up. He subsequently developed PTS with an ulcer that healed with compression therapy. In patients with DVT compliance treatment and follow-up are important to reduce the post-thrombotic signs and symptoms.

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