

MASSIVE ILIOFEMORAL THROMBOSIS IN AN 18-YEAR-OLD MAN TREATED WITH AN ENDOVASCULAR PROCEDURE

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ABSTRACT

Introduction: Venous thromboembolism remains a widespread global problem that occurs not only in elderly patients but also in younger individuals. Most patients receive conservative treatment for deep vein thrombosis (DVT), but 20–50% of them will develop post-thrombotic syndrome as a consequence.

Material and methods: An 18-year-old man was admitted to the hospital with massive swelling and pain of the left leg. After a primary diagnostic process, computed tomography phlebography was performed, which revealed no contrast in the common iliac vein, external iliac vein, internal iliac vein, femoral vein, and great saphenous vein on the left side. The diagnosis of DVT was stated. Additionally, compression of the right common iliac artery on left iliac vein was visualized, which indicated May-Thurner syndrome.

Results: Mechanical thrombectomy was performed using the AngioJet system. Additionally, local thrombolysis was performed. For better outflow from the iliac vein, stent implantation was performed using a Bentley Beyond Venous 16 × 100 mm stent. Due to a rupture of the venous stent, an additional Sinus-XL 16 × 60 mm stent and a Sinus Venous 14 × 60 mm stent were implanted. Control phlebography was performed, and procedure was ended by leaving the 6F sheath in the popliteal vein with administration of Actilyse for 24 hours. Venography performed on the next day revealed an optimal result with very good outflow. What is more, the patient reported pain relief, and the leg swelling decreased.

Conclusions: Endovascular recanalization of the iliofemoral vein thrombosis is technically possible, safe, and durable.

Key words: deep vein thrombosis, May-Thurner, venous stent, endovascular.

CASE REPORT

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INTRODUCTION

Venous thromboembolism remains a widespread global problem that occurs not only in elderly patients, but also in younger individuals [1]. Most patients receive conservative treatment for deep vein thrombosis (DVT), but 20–50% of them will develop post-thrombotic syndrome (PTS) as a consequence [2]. To prevent such a complication, in selected cases an endovascular procedure followed by a stent implantation is required, especially in cases involving compression syndromes. Mechanical thrombectomy and local thrombolysis possibly reduce the severity of symptoms and the incidence of PTS. In addition, placement of the stent can reduce outflow obstruction and decrease possibility of DVT in the future [3].

CASE PRESENTATION

An 18-year-old man was admitted to the hospital with massive swelling and pain in the left leg. The patient

reported that he had fallen on the floor in the evening, and he noticed the symptoms after he woke up the following morning. After the primary diagnostic process Doppler ultrasound (DUS) was performed, which confirmed DVT. Due to his young age, extensive symptoms, and suspicion of iliac vein thrombosis raised in DUS, computed tomography phlebography was performed. Computed tomography phlebography revealed no contrast in the common iliac vein, external iliac vein, internal iliac vein, femoral vein, and great saphenous vein on the left side, presented in Figures 1A–D. The common iliac vein, external iliac vein, and femoral vein were dilated to diameters, respectively, of 15 mm, 22 mm, and 22 mm. Additionally, the compression of the right common iliac artery on the left iliac vein was visualized, which indicated May-Thurner syndrome. Initially, a heparin infusion was applied. The next day the decision was made to treat this thrombosis with endovascular procedure. The procedure was performed under general anaesthesia with the patient positioned on his abdomen. The position

enabled access through the popliteal vein. A 6F sheath was introduced to the popliteal vein, and guidewires were passed through the thrombus to the inferior vena cava. Venography shown on Figures 2A, B confirmed deep vein thrombosis. The guidewire was converted to a stiff guidewire and an AngoJet Solent Omni catheter was introduced. Afterwards mechanical thrombectomy was performed using the AngioJet system. To achieve a superior result, 20 mg of Actilyse was administered. After 20 minutes another mechanical thrombectomy was performed beginning in the femoral vein and finishing in the inferior vena cava. Partial patency was achieved. Next, the aspiration of the thrombus was performed using an 8F sheath, but the result was suboptimal, with obstruction of the iliac vein in the place of common iliac artery compression. The sheath was changed to 10F as the stent implantation was required in left common iliac vein. A Bentley Beyond Venous 16 × 100 mm stent was implanted; however, stenosis of the vein led to damage of the stent. Presumably the rupture of the stent meshes at the stenosis occurred, which is shown in Figure 3B. For appropriate outflow a Sinus- XL 16 × 60 mm stent was implanted into the first stent with subsequent post dilation using an AtlasGold 16 × 40 mm balloon. Proper outflow was observed, but the thrombus was found in

the external iliac vein, which was provided with a Sinus Venous 14 × 60 mm stent implantation. Again, balloon dilation, using an AtlasGold 14 × 60 mm, of the Sinus Venous stent and balloon dilation of the femoral vein using an AtlasGold 10 × 80 mm was applied. The result of the procedure is shown on Figures 3A–C. Control phlebography was performed, and the procedure was ended by leaving the 6F sheath in the popliteal vein with administration of Actilyse for 24 hours. Venography (Figures 4A–C) performed the next day revealed an optimal result with very good outflow. What is more, the patient reported pain relief and the leg swelling decreased. The patient was released home the next day with a recommendation of 3 months of anticoagulation therapy. The patient returned after 30 days for a control DUS and examination. The Doppler ultrasound and examination revealed no obstruction in the left venous system and full relief of the symptoms.

DISCUSSION

The popularity of invasive and percutaneous treatment is increasing, especially in symptomatic patients [4]. The improvement of mechanical thrombectomy devices and development of the technique have enabled

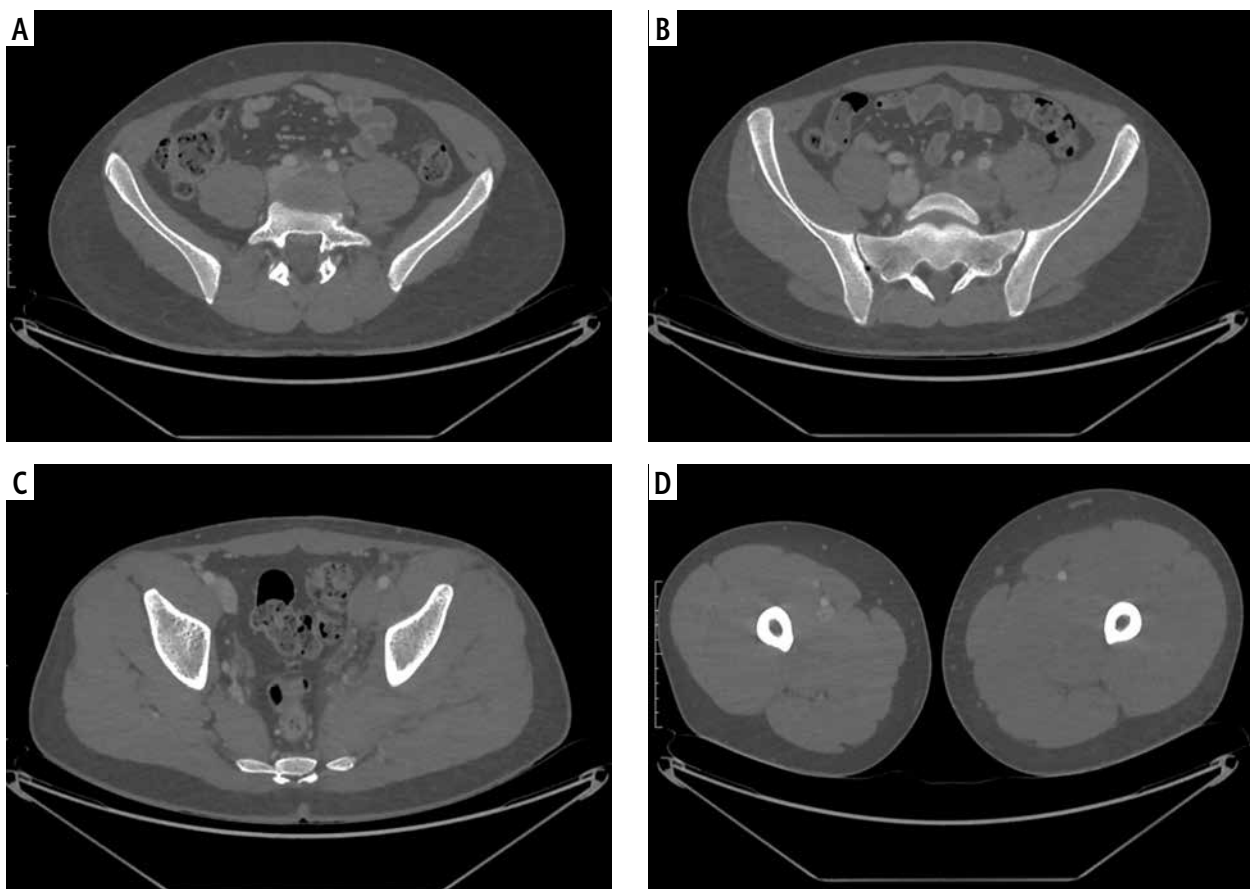


Fig. 1. Computed tomography phlebography. **A)** Image of thrombus positioned in left, **B)** common iliac vein, **C)** external iliac vein, and **D)** femoral vein



Fig. 2. Venography, which confirmed deep vein thrombosis in: **A)** femoral vein, **B)** iliac vein with visualization of compression region

completion of therapy in a single hospital stay, using minimal amount of thrombolytics, shorter time of the procedure, shorter hospital stay, and lower treatment costs. What is more, clinical and technical success is achieved in the majority of patients, with acceptable safety of the procedure [5].

Stenting of iliofemoral vein stenosis is characterized by decreased morbidity and mortality; in addition, high long-term patency rates are observed [6]. The first time that stenting following DVT was reported was by Berger *et al.* [7]. Since then stenting has been found to be a sufficient and effective method of treatment of May-Thurner syndrome, which was confirmed in a recent multicentre study that evaluated acute and long-term results [8].

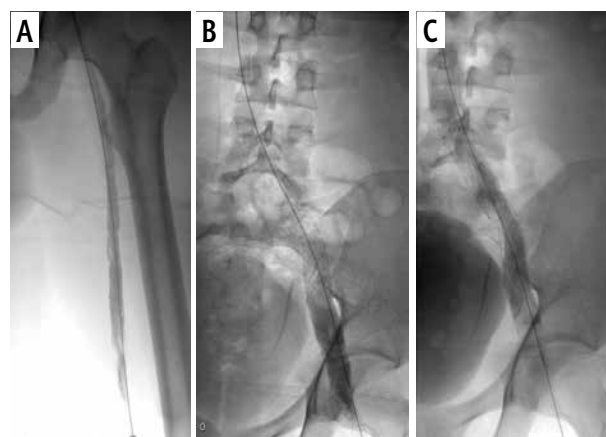


Fig. 3. The result after endovascular procedure including mechanical thrombectomy, local thrombolysis, and stent implantation. **A)** Femoral vein after mechanical thrombectomy and local thrombolysis, **B)** ruptured stent after implantation, and **C)** venography after implantation of additional stents inside ruptured stents

It was also observed that using stents dedicated to veins leads to increased patency rates because venous stents, compared to arterial devices, have greater diameter and lower radial force, which affects the venous wall patency, and they have a low restenosis rate. Additionally, venous stents are associated with proper diameter, flexibility, crush resistance, radial strength, and the possibility of precise implantation [9]. Many anticoagulant and antiplatelet treatment tactics have been described in the literature; however, no guidelines for therapy after vein stenting in vein occlusions have been established [10]. Nevertheless, after analysis of experts' opinions, it can be stated that in the case of long stent implantations, a long anticoagulation strategy should be applied [11].



Fig. 4. Result after 24 hours of local thrombolysis

CONCLUSIONS

Endovascular recanalization of the iliofemoral vein thrombosis is technically possible, safe, and durable. Successful reconstruction using stent implantation in patients presenting with symptoms might significantly improve their clinical state. Stenting in May-Thurner syndrome may lead to complications such as stent rupture, but those complications can be treated successfully.

The authors declare no conflict of interest.

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