



Letter to the Editors-in-Chief

Iliofemoral deep vein thrombosis caused by rare complication of orthopedic surgery



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1. Introduction

Surgical operations are known to be associated with increased risk for deep vein thrombosis (DVT). Moreover, the highest risk among all surgical specialties is observed in orthopedics [1]. DVT risk depends on the type of operation, duration of immobility, and whether or not thromboprophylaxis is received by the patient before the surgery. In addition, venous injuries, which may occur during arthroscopic and orthopedic procedures are also believed to be associated with an increased risk for deep vein thrombosis.

2. Case report

A 42-year-old female patient was admitted to the hospital experiencing swelling, pain, and tenderness in her proximal right lower extremity. The patient sustained a femur fracture in a car accident and had an open reduction and internal fixation (ORIF) procedure about 20 days before the admission. Doppler examination performed upon admission showed deep vein thrombosis from mid-femur to the iliac venous system on the right. The patient received oral anticoagulation therapy for about a week, during which her symptoms became more severe necessitating a percutaneous intervention. The intervention was performed by using the balloon angioplasty method in consideration of the hemorrhagic stroke observed in the patient. For the same reason, the thrombolytic therapy was contraindicated and the transpopliteal venous approach was preferred. A 6F sheath was placed into the popliteal vein and the lesion was crossed using an angled 0.035-inch hydrophilic guidewire. Surprisingly, the angiographic image demonstrated a femoral vein attached to the bottom of the internal fixation ring, which was also confirmed by releasing a radiopaque substance from the popliteal sheath (Fig. 1, Video 1). Based on the above-mentioned diagnosis, a treatment with surgery was suggested. A surgical reconstruction was performed on the venous structure, along with the release of femoral venous from the internal fixation ring. (Fig. 2, Video 2) Following the surgery, another percutaneous intervention was performed and this time a high thrombus load was seen, especially on the common femoral and iliac venous of the venous segment (Fig. 3, Video 3). The lesion was crossed using an angled 0.035-inch hydrophilic guidewire as before and the balloon maceration of residual thrombus

was implemented to the common femoral and iliac venous via a 5 mm × 120 mm peripheral balloon (Fig. 4, Video 4), whereby the venous flow was provided from the common femoral (Fig. 5, Video 5). After the procedure, the patient was put on anticoagulant therapy. Color flow venous doppler and physical examination performed during the follow-up consultation, 1 month later, revealed no trace of a thrombus formation.

3. Discussion

Deep vein thrombosis (DVT) is a blood clot that occurs especially in the lower extremity veins. DVT can cause strong pain, swelling, tenderness, and warm skin in the affected area. Several factors are predisposing to DVT such as the vein injuries with direct trauma or occurring during surgical interventions, post- and pre-operative processes, long-term immobility, obesity, pregnancy, hormone therapy, and malignancy. In the case of surgical interventions, the degree of the risk is closely related to the type of surgery, duration of immobility, and whether or not the thromboprophylaxis is received by the patient before the surgery. Some orthopedic operations are particularly more prone to causing the development of DVT [1]. For instance, the hip and knee arthroplasty, hip fracture surgery, and pelvic and multiple fractures are associated with the highest risk. In addition to these risk factors, etiological factors such as the Virchow's triad's components, which are venous stasis, vascular injury, and hypercoagulability, also play a role in the formation of DVT. In any case, if the pathology is not treated it leads to fatal or non-fatal complications such as the pulmonary embolism (PE), postthrombotic syndrome, and chronic venous insufficiency.

D-dimer and physical examination are important components for investigating the presence of DVT. In addition, some non-invasive imaging modalities such as the Doppler ultrasonography, contrast-enhanced computed tomography, and magnetic resonance imaging are widely used for diagnosing DVT as an alternative to the invasive methods. Having said that, venography appears to be the most useful applied technique for the diagnosis of deep vein thrombosis. However, besides being invasive, this technique is not always technically possible and it carries a small risk of an allergic reaction or venous thrombosis [3].

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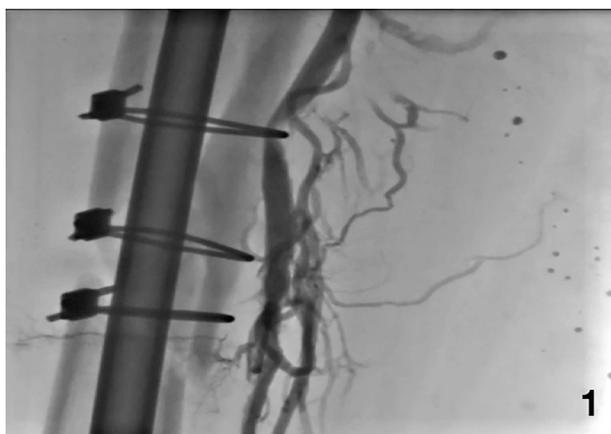


Fig. 1. Attached femoral vein is seen on angiographic image.

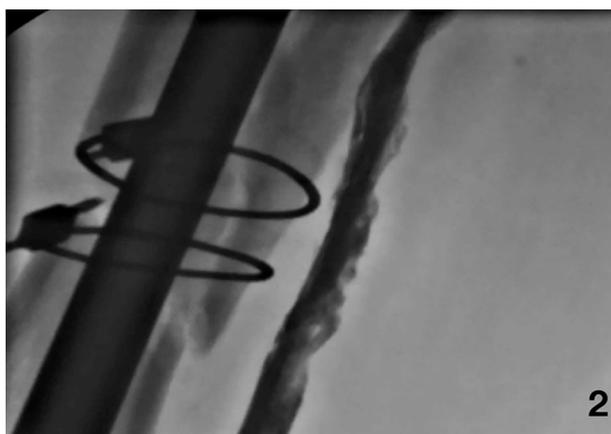


Fig. 2. The femoral vein was released after operation.

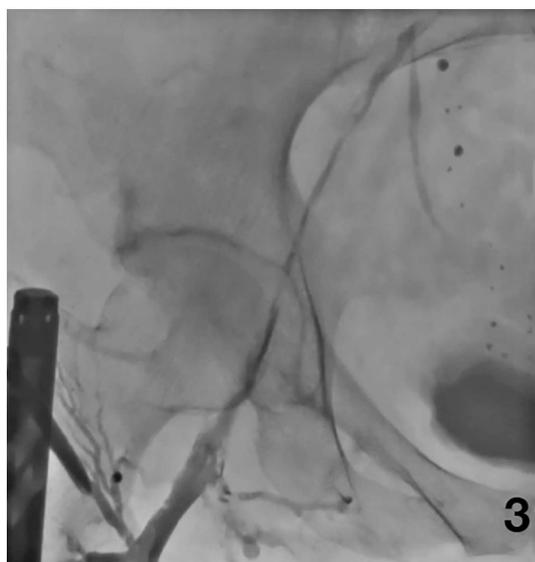


Fig. 3. Angiographic image demonstrates iliofemoral deep vein thrombosis.

There are various options for the treatment of DVT. Anticoagulation is the first step treatment method, whereby the oral anticoagulation agents and heparins are widely used at present. Alternative methods include the thrombolytic therapy and compression stockings. In addition, vena cava (IVC) filter presents an important therapeutic option in certain cases to presumably prevent life-threatening PE. On the other hand, invasive treatment procedures are preferably limited to the

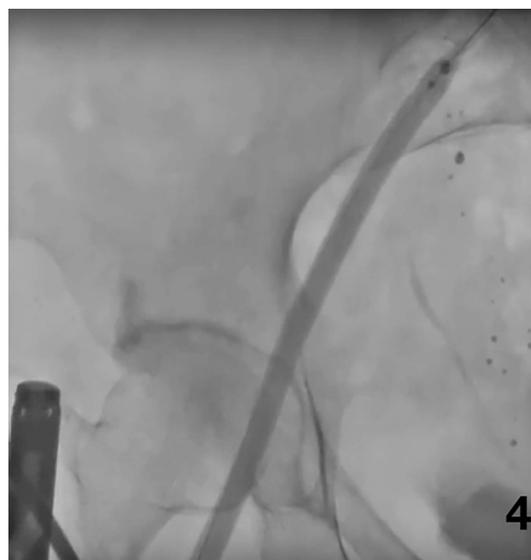


Fig. 4. Balloon was inflated into thrombus.

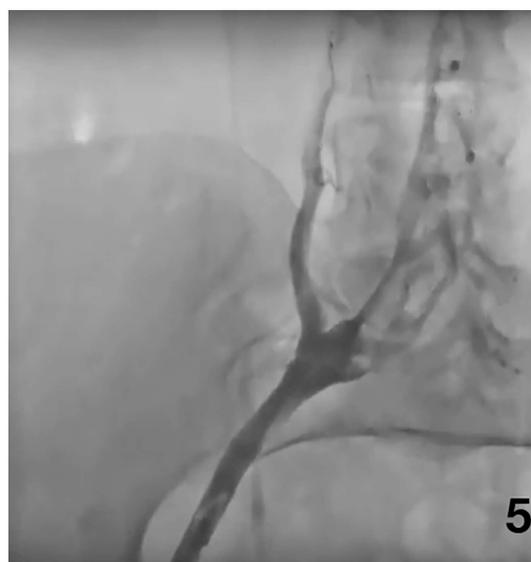


Fig. 5. After balloon dilatation cava inferior venous return is seen.

clinically severe manifestations of DVT including the phlegmasia cerulea dolens, acute IVC thrombosis rapid thrombus extension despite anticoagulation, and anatomically extensive DVT that includes the common femoral vein and/or iliac vein. [2]. Moreover, interventional options, such as the catheter-directed thrombolysis (CDT) angioplasty-balloon and pharmacomechanical catheter-directed thrombolysis methods, are emerging.

The case discussed above necessitated an invasive treatment. The balloon angioplasty method had to be chosen. However, during the procedure, a rare complication induced by a previously performed orthopedic surgery was seen on angiography. As experienced by our patient and elaborated above, this kind of prolonged complaints after the surgery may be associated with a venous injury. Besides the interventional treatment option, diagnostic venography could also be useful for detecting the postoperative complications.

4. Conclusion

In conclusion, various modalities for the diagnosis and treatment of deep vein thrombosis are available. However, in the presence of

prolonged and treatment-resistant DVTs, in particular the post-operative DVT, performing venography may prove to be indispensable, especially for detecting the underlying pathology.

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.thromres.2019.10.024>.

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