

## Percutaneously Inserted AngioVac Suction Thrombectomy for the Treatment of Filter-Related Iliocaval Thrombosis

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### Abstract

In the setting of acute iliocaval thrombosis due to reversible causes, thrombus removal is preferred by many in the management of inferior vena cava (IVC) thrombosis as it is thought likely to minimize the long-term complications of chronic venous insufficiency and post-thrombotic syndrome. When catheter-directed thrombolysis is not a viable or effective option, the treatment options are limited. We present the case of a 56-year-old hospitalized patient with a permanent IVC filter that had been inserted 10 years prior at an outside hospital with severe, incapacitating right leg swelling for which amputation was considered. The patient underwent suction thrombectomy after failure of thrombolysis. The patient's presenting symptoms of right lower extremity swelling and pain improved upon discharge. In our single case, unassisted suction thrombectomy with percutaneously placed cannulae is an effective and safe method for the treatment of permanent IVC filter-related iliocaval thrombosis in cases refractory to catheter-directed thrombolysis.

*Key words:* chronic venous insufficiency, thrombectomy, thrombolytic therapy

### Introduction

In the setting of acute iliocaval thrombosis due to reversible causes, thrombus removal is preferred by many in the management of IVC thrombosis as it is thought likely to minimize the long-term complications of chronic venous insufficiency (CVI) and post-thrombotic syndrome (PTS).<sup>1</sup> Systemic therapies for acute iliocaval thrombosis do not rapidly remove thrombus burden.<sup>2</sup> The majority of reports suggest that thrombolytic therapy, delivered locally using catheter-directed thrombolysis (CDT; with or

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without a pulse-spray and/or a pharmacomechanical adjunct), should be administered as soon as possible after the patient becomes symptomatic and ideally within 14 days of onset of symptoms to minimize the risk of CVI and PTS.<sup>1-3</sup> When catheter-directed thrombolysis is not a viable or effective option, the treatment options are limited. AngioVac (AngioDynamics) is a suction thrombectomy device FDA approved for “removal of undesirable intravascular material.”<sup>4</sup> Limited peer-reviewed data are available on its percutaneous application in the management of ilio caval thrombus. We describe the case of a patient with severe leg swelling and permanent filter-related ilio caval thrombosis who was treated successfully with unassisted percutaneously inserted AngioVac suction thrombectomy.

### Case Presentation

A 56-year-old hospitalized patient with a permanent Venatech IVC filter that had been inserted 10 years prior at an outside hospital presented to our service with severe, incapacitating right leg swelling for which amputation was considered. The patient has a surgical history of an occluded left-to-right femoral-femoral venous bypass for chronic left external iliac and common femoral occlusive venous thrombosis. Ultrasound and venography showed acute right lower extremity thrombosis and ilio caval occlusive thrombosis involving the IVC filter.

### Treatment

Through access in the right posterior tibial and femoral veins, the patient underwent 2 sessions of catheter-directed alteplase thrombolysis (total rate 0.5mg/hr) and heparin infusions (500 U/hr). Lysis was hampered by 2 interruptions for long intervals due to hypofibrinogenemia (exacting multiple transfusions of cryoprecipitate). Catheter-directed lysis was eventually terminated after 2 days due to lytic stagnation. In the interventional radiology suite, angioplasty of the thrombosed IVC filter with a 14 mm Atlas balloon (Bard) was performed to allow for the passage of a 22 Fr AngioVac suction device into the suprarenal IVC (via a percutaneously introduced 26 Fr right femoral vein sheath). With the assistance of the perfusionist, the AngioVac femoral vein cannula was coupled to the AngioVac venovenous bypass device

where the blood is filtered, anticoagulated, and returned to the patient via a percutaneously inserted 18 Fr right internal jugular AngioVac inflow sheath (tip at the right atrium). The femoral outflow sheath was slowly retracted under continuous AngioVac suction. Large amounts of chronic-appearing thrombus were trapped in the filter as shown in Figures 1 and 2. The femoral and jugular cannulae and sheaths were removed and hemostasis was achieved with 20 minutes of manual pressure. Activated clotting time was kept above 300.

## Results

Post-AngioVac suction thrombectomy images demonstrate near complete evacuation of thrombus material and restoration of ante-grade flow within the inferior vena cava, right common iliac vein, and right external iliac vein as shown in Figures 3 and 4. The patient's presenting symptoms of right lower extremity swelling and pain improved upon discharge.

## Conclusion

In our single case, unassisted AngioVac suction thrombectomy with percutaneously placed cannulae is an effective and safe method for the treatment of permanent IVC filter-related ilio caval thrombosis in cases refractory to catheter-directed thrombolysis.

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Figure 1. Suctioned thrombus



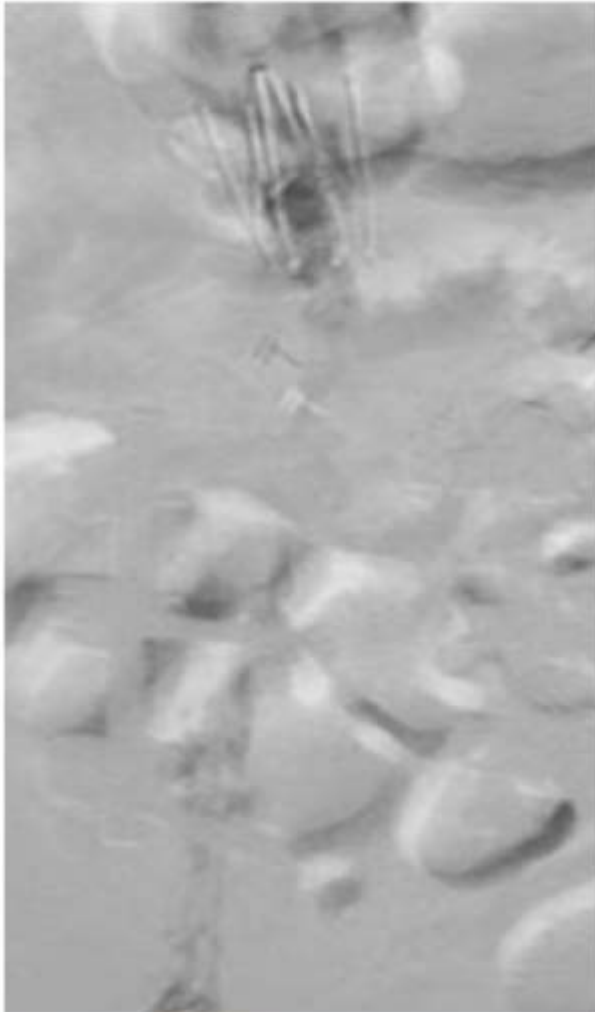
**Figure 1.** Suctioned thrombus.

Figure 2. Angiovac filter with suctioned thrombus



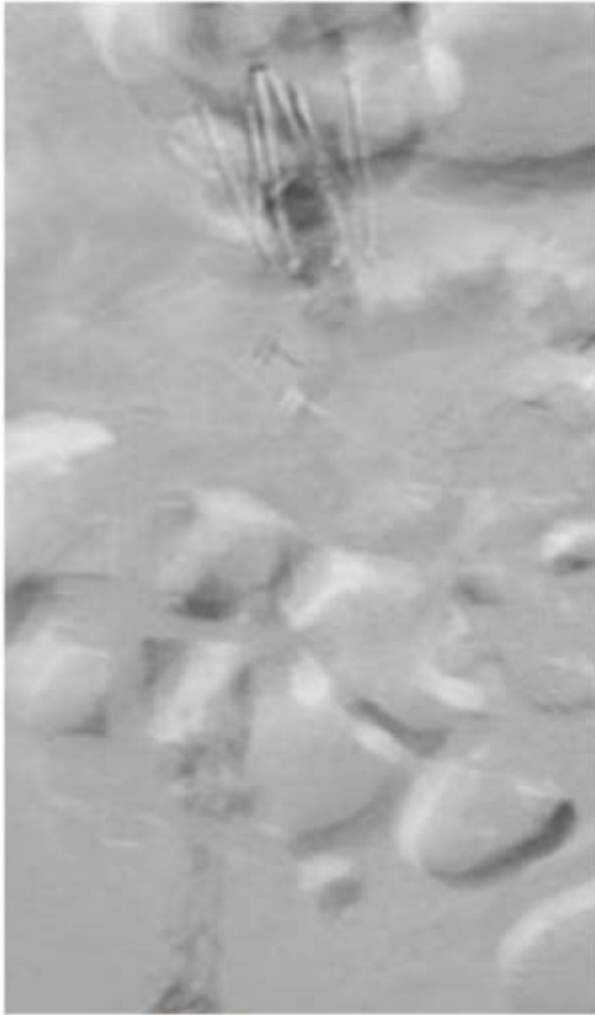
**Figure 2.** Angiovac filter with suctioned thrombus.

Figure 3. Inferior cavogram prior to suction thrombectomy



**Figure 3.** Inferior cavogram prior to suction thrombectomy.

Figure 4. Improved flow in the inferior vena cava post suction thrombectomy.



**Figure 3.** Inferior cavogram prior to suction thrombectomy.