Acoustic pulse thrombolysis (EKOS®), and a suprarenal inferior vena cava filter for the treatment of extensive Inferior Vena Cava thrombosis over pervious Inferior vena cava filter in a case of antithrombin III deficiency

Mahmoud Elmeniesy MD, EBVS; consultant vascular surgery

co-authors: Safwat Eldaabossi, Khalid Aljoqman, Yasser Gaber, Amgad Awad, Mohamad Almolhem, Abdallah Farouk, Waheed Mahdi, Ahmad Kabil, Ahmed Taha, Sameh Makled.

Introduction:
Pulmonary embolism (PE) is a frequently avoidable cause of death among hospitalized patients. While the inferior vena cava (IVC) filter is a viable treatment option for preventing PE in certain patients. Inferior vena cava thrombosis (IVCT), although rare, has a potential for significant morbidity and mortality. Antithrombin III leads increased risk of venous and arterial thrombosis and typically present in young adulthood.

Case presentation:
We present a case with antithrombin III deficiency and recurrent venous thromboembolism. He was initially treated with anticoagulants and an IVC filter for bilateral pulmonary embolism. However, he later developed acute inferior vena cava thrombosis and bilateral extensive acute deep vein thrombosis of the lower extremities. The patient was successfully treated with endovascular ultrasound-guided catheter thrombolysis (EKOS), thrombectomy, venoplasty, and placement of a new suprarenal filter.

Presentation:
A 31-year-old gentleman with history of recurrent deep vein thrombosis and transient ischemic attacks due to antithrombin deficiency III. He was admitted to the hospital with sudden chest pain, shortness of breath, nausea, and vomiting.

He was treated with a full dose of low-molecular-weight heparin, and an infrarenal IVC filter was inserted 2 weeks before in other facility.

A few days later, he developed swelling and pain in both lower limbs, and subsequent duplex venography confirmed a new proximal DVT.

CT Pulmonary angiography:
confirmed bilateral distal nonobstructive pulmonary embolism.

CT venography:
showed acute to subacute IVC thrombosis and saddle-shaped thrombus in the common iliac veins down to the popliteal veins, but the suprarenal IVC was patent, as well as the renal and hepatic veins.

Endovascular interventions:
• suprarenal IVC DINALI ® filter insertion through right internal jugular vein puncture
• diagnostic conventional venography confirm result of CTV of thrombosed IVC
• acoustic pulse thrombolysis catheter (EKOS®) inserted through right popliteal vein puncture
• follow up venography done 48-hour post insertion of (EKOS®) with venoplasty and removal of old infrarenal OPTEASE® filter showed improved IVC thrombosis

Follow up:
• Patient discharged from hospital few days later on warfarin with adjustment on INR to a therapty range.
• 4 months later, patient symptoms improved.
• At that time, through right internal jugular vein puncture IVC DINALI ® filter retrieval done Venography was done a conventional cavogram shows patent IVC lumen.

Follow up CTV:
• Removal of IVC filters.
• partial recanalization of infrarenal IVC, iliac and venous trees of both lower limbs.

Conclusion:
• This case highlights the challenges of diagnosing and treating a complex case of IVC filter thrombosis in antithrombin III deficiency.
• placement of a new IVC filter proximally -suprarenal- with acoustic pulse thrombolysis catheter (EKOS®) followed by removal of a thrombosed IVC filter and venoplasty.
• It shows to be effective in improving the patient symptoms and outcome.