Successful Catheter Directed Thrombolysis of IVC and Renal Vein Occlusive Thrombus

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Abstract
Thrombus formation is a recognised complication of IVC filter placement, however IVC and bilateral renal vein occlusion secondary to thrombus is much less common. We present a case of infrahepatic caval and bilateral renal vein occlusion secondary to thrombosis of a suprarenal IVC filter. With progressive clinical deterioration and failure of conservative medical management the patient underwent successful mechanical disruption and catheter directed thrombolysis.

Introduction
Acute renal failure secondary to bilateral renal vein thrombosis has been described once before in the setting of early IVC filter migration and thrombosis. We present a case of acute renal failure secondary to complete infrahepatic caval and bilateral renal vein thrombosis as a result of thrombosis of a longstanding suprarenal IVC filter. We describe interventional radiological therapies of mechanical disruption and catheter directed thrombolysis which were successful in recanalising the vessels and returning renal biochemistry to near normal levels.

Case Report
A 59 year old female non national presented to our institution with abdominal pain and acute renal failure (creatinine 151µmol/l). She had a prior history of hysterectomy and bilateral oopherectomy for borderline ovarian malignancy. An IVC filter was placed 3 years ago for recurrent pulmonary emboli while on therapeutic anticoagulation. She was not on anticoagulation at the time of presentation. The initial renal ultrasound was unremarkable, however she continued to deteriorate clinically. A non contrast CT scan showed distension of the IVC and renal veins, with bilateral renal enlargement and perinephric stranding concerning for ischaemia. Her IVC filter was noted to be in a suprarenal position and overall findings were suspicious for extensive venous thrombosis. She was commenced immediately on therapeutic unfractionated heparin, however her clinical condition did not improve. Her creatinine peaked at 540 and an interventional radiology opinion was sought.

The venous system was accessed via a right common femoral approach and venography showed complete occlusion from the level of the right common iliac vein proximally, including the infrahepatic IVC and renal veins bilaterally (Figure 1). Via Seldinger technique a Cragg McNamara infusion catheter (ev3, Irvine, California) was introduced for on table thrombolysis using 20mg of tPA. This was combined with mechanical thrombolysis using a ProntoTM thrombectomy catheter (Vascular solutions, Inc., Minneapolis, Minnesota). At the end of the procedure the infusion catheter was left in situ across the length of the IVC thrombus and tPA was infused at a rate of 2mg/hr for 7 hours and then 1mg/hr for 9 hours. An unfractionated heparin infusion ran concurrently at 300iu/hr. The tPA infusion was ceased after 16 hours due to low fibrinogen levels and the patient returned to the IR suite for repeat venogram which showed good radiological resolution with patent vessels and minimal wall thrombus. Postprocedure the heparin infusion was continued with a target APTT 2.0-2.5 and lifelong oral anticoagulation was initiated with a target INR of 2 to 3.

Three weeks post procedure her creatinine was 117. She returned home for follow up.

Figure 1: The initial venogram, showing occlusion of the IVC proximally from the right common iliac vein. As the infusion catheter was advanced, complete occlusion of the infrahepatic IVC and right and left renal veins was confirmed.

Figure 2: Repeat Venogram post catheter directed thrombolysis and mechanical disruption of thrombus. Selective cannulation of the left renal vein shows a patent vein with minimal residual wall thrombus. Further assessments confirmed patent IVC and right renal vein.
Discussion
Filter thrombus is common, rates vary with filter type, one recent 7 year retrospective study found rates of 18.3%, with IVC occlusion rates of 2%. Contrast to popular belief, the placement of IVC filters above the renal veins does not carry an added risk of complications. Renal vein thrombosis is rare, it has been documented in nephrotic syndrome. Combined IVC/renal vein thrombosis is even rarer. It has been described in acute pancreatitis and recently the first case related to a migrated IVC filter was described. Filter placement is often erroneously viewed as a simple straightforward procedure, however serious life threatening complications have been described including IVC occlusion/rupture and intracardiac migration. While filters play an important role in the management of refractory thrombosis, careful consideration of individual circumstances must be undertaken prior to placement.

When a patient with an IVC filter presents with abdominal pain and acute renal failure, thrombosis of the renal veins must be in the differential. Information on the management of this condition is sparse with anticoagulation used primarily to prevent propagation of thrombus. The authors of this case advise catheter directed thrombolysis in combination with mechanical disruption as described above for treatment of large volume thrombus. This approach can result in vessel recanalisation and normalisation of renal function.

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References

Comments:

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