Case Report

Acute inferior vena cava thrombosis in a patient with membranous nephropathy treated by rt-PA lysis

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Case report

A 44-year-old man presented in February 1995 with generalized oedema. He also complained of diarrhoea and a long history of recurrent perianal fissures. Investigations on admission revealed serum creatinine of 84 μmol/l, serum albumin of 21 g/l, and 24-h urine protein of 14.6 g. Antinuclear antibody, HBsAg, and syphilis serology were negative. Renal biopsy, including light-microscopy and immunofluorescence, showed membranous nephropathy. A radiolabelled technetium scan showed increased uptake on the left side of the abdomen consistent with inflammatory bowel disease. Barium enema and colonoscopy were not helpful diagnostically. A rectal biopsy showed only non-specific proctitis.

The nephrotic syndrome persisted, with proteinuria of >10 g/24 h and serum albumin 18–25 g/l. He required numerous infusions of concentrated albumin and was also treated with oral steroids to control his bowel symptoms. He continued to have perianal abscess and required surgery for them in August 1995. Blood pressure and serum creatinine remained normal.

On 13 November 1995 the patient complained of pain and swelling of his left leg. Doppler ultrasound revealed occlusion of the left femoral vein. He was treated with i.v. heparin and then warfarin, aiming for an international normalized ratio (INR) of 2.0–3.0. On 24 November he developed increased swelling of his left leg and distended abdominal veins. A clinical diagnosis of inferior vena cava thrombosis was made. INR was 2.5.

A venogram via the right femoral vein revealed extensive non-occlusive thrombus extending up to the junction of the inferior vena cava with the right atrium (Figure 1). This was confirmed by transoesophageal echocardiography.

On advice from a haematologist, treatment was started with streptokinase 600,000 units i.v. in 30 min followed by 100,000 units/h for 72 h. This was followed by daily infusions of antithrombin III and continuous intravenous heparin. A repeat cavogram 3 days later...
showed only minimal improvement. A decision was then made to proceed to intrathrombic lysis with recombinant tissue-type plasminogen activator (rt-PA) but this was delayed because of failure of angiographic equipment.

Four days later a temporary inferior vena cava filter was inserted via the right internal jugular vein (Figure 2). rt-PA was infused via a catheter from the right femoral vein by combination of pulse spray and drip infusion for 48 h. The catheter was placed within the inferior vena cava thrombus and then the left iliac thrombus. A repeat cavogram after this showed near complete resolution of the thrombus in the inferior vena cava and iliac veins (Figure 3). The temporary inferior vena cava filter was removed; it was decided not to insert a permanent inferior vena cava filter because of its potential thrombogenic effect. Continuous i.v. heparin and daily antithrombin III infusions were continued over this period.

On the third day following rt-PA lysis, the patient developed a haematoma over the right patella and antithrombin III infusions were stopped. Warfarin was commenced, aiming for an INR of 3–4.5. Minor setbacks following this included a right leg cellulitis and a fungal rash. Both responded to standard treat-

The nephrotic syndrome is a hypercoagulable state and thrombosis is a relatively frequent and serious complication [1]. The prevalence of overt clinical deep-vein thrombosis is 6% in nephrotic adults but thrombi may be detectable in as many as 25% if Doppler ultrasonography is used. The incidence of inferior vena cava thrombosis in membranous nephropathy is not known.

Discussion

The nephrotic syndrome is a hypercoagulable state and thrombosis is a relatively frequent and serious complication [1]. The prevalence of overt clinical deep-vein thrombosis is 6% in nephrotic adults but thrombi may be detectable in as many as 25% if Doppler ultrasonography is used. The incidence of inferior vena cava thrombosis in membranous nephropathy is not known.
Inferior vena cava thrombosis is an uncommon condition and is usually associated with a secondary cause such as abdominal surgery, tumour, peripheral deep venous thrombosis, Budd–Chiari syndrome, or a systemic coagulopathy, including the nephrotic syndrome [2]. Rarely, no cause is found. The diagnosis of inferior vena cava thrombosis is suspected clinically in less than 40% of cases.

Anticoagulation with heparin and warfarin has been standard therapy in the past [3] but may be associated with extension of caval thrombosis in 30% of cases and a recurrent pulmonary embolism rate of 20% [4]. Successful thrombolytic therapy with systemic intra-venous streptokinase and urokinase has been reported [5,6]. A continuous infusion has been used in most cases but experiments in rabbits have suggested that pulse spray infusion of lytic agent enhances thrombolysis. There have been two reported cases of regional rt-PA treatment in neonates with inferior vena cava thrombosis [7]. There has been a single report in an adult of successful prolonged intrathrombic infusion of rt-PA in combination with a temporary inferior vena cava filter to prevent pulmonary embolism [8]; this patient did not have nephrotic syndrome.

Inferior vena cava thrombosis can be treated ‘mechanically’ using a balloon embolectomy catheter [4]. However, on follow-up, 38% of patients had occlusion of the inferior vena cava and only 38% had a normal iliac vein. The use of a saline jet aspiration thrombectomy catheter in the treatment of a patient with acute inferior vena cava thrombosis has also been reported [7].

This case demonstrates that inferior vena cava thrombosis in the nephrotic syndrome can be successfully treated by intrathrombic lysis with rt-PA.

References
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