Successful Local Thrombolytic Treatment of Inferior Venacaval and Left Renal Thrombus in a Nephrotic Patient

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A case of diffuse endomesangial proliferative glomerulonephritis, developed a worsening of proteinuria and oedema and development of ascites, a left pleural effusion and splenomegaly, due to IVC and left renal vein thrombosis is presented. The patient was successfully treated with local instillation of streptokinase.

A 27-year-old computer engineer came to our OPD with a history of, swelling of face and feet and abdominal distension of 1½ months' duration, and a generalized erythematous rash of 2 months' duration. He had been detected to have hypertension and proteinuria, and renal biopsy done then showed 21 glomeruli, with diffuse proliferation of endomesangial cells, partial obliteration of capillary lumina, a polymorphonuclear exudate and 15% crescents, on haematoxylin and eosin stain.

He was treated with losartan 25 mg b.i.d., furosemide 11 mg b.i.d., atorvastatin 10 mg, aspirin 150 mg, and captopril 200 mg. All his complaints had exacerbated 8 days prior to presentation at our hospital and so he had been started on prednisolone 80 mg daily. He had no complaints of haematuria, or of systemic disease.

**History**

Past history and family history were unremarkable. Examination revealed a male of height 178 cm, weighing 77 kg, with a pulse of 76 min, blood pressure of 140/90 mm Hg, putting edema grade VI and a fading papillary rash on the abdomen and back. He had a Gushinge, soft, abdominal skin and a smooth thinned-out umbilicus. Jugular distension was normal. Abdominal examination revealed ascites, mild hepatomegaly and splenomegaly of 9 cm, and no renal angle tenderness.

Examination of the chest revealed a large left-sided pleural effusion.

The cardiovascular and central nervous system were normal. A renal ultrasound revealed 4+ albuminuria, 7-8 RBCs and 4-5 pus cells per high power field. 1-2 granular casts and a single RBC cast.

**Investigations on admission**

The haemogram showed a haemoglobin of 13.3 g%, a total count of 13000 mm³, with 88% polymorphs and a platelet count of 351 lac. His blood urea was 127 mg%, with serum creatinine of 1.3 mg%, serum total protein of 3.6 g%, with plasma albumin of 1.7 g%, serum cholesterol was 827 mg%, iron was 98 mcg% with LDL cholesterol of 540 mg%, HbC, complement component levels were normal (normal range 68-84%), ANA was positive, but ds-DNA levels were normal. Serology for hepatitis B, C and HIV were negative.

Twenty-four hours urine collection contained 2.2 g of protein.

A chest X-ray showed a large radio-opaque shadow in the left hemithorax with a convexity upwards (Fig. 1).

A diagnosis of proliferative glomerulonephritis with a possible underlying malignancy was considered in view of splenomegaly and a left pulmonary mass, and a CT scan of the abdomen and thorax was done, which revealed a huge echogenic, pleural effusion and an inferior venacaval thrombus.

One thousand and six hundred ml of fluid was drained from the left hemithorax, which contained 1.1 l of

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protein and 50 cells/mm³, all lymphocytes.

An IVC cavogram done through a right femoral venipuncture, on 11/10/01 revealed a large IVC thrombus with extension into the left renal vein (Fig. 2) and the patient was given a local infusion of streptokinase 1.5 lac units over 20 min, followed by a 30-hr infusion of 20,000 units/hr. A repeat cavogram (Fig. 3) revealed complete clearance of the thrombus and the patient was anticoagulated initially with dalteparin 5000 units twice daily subcutaneously, and then oral warfarin maintaining the INR between 2.5 and 3.0.

His prednisolone, diuretics and lipid lowering agents were continued.

His proteinuria showed a marked decline following thrombolysis. Serum urea decreased, urinary protein creatinine and ascites disappeared completely as shown in Table 1. Serum proteins albumin urinary too returned to normal.

At present, he is asymptomatic and is on only 20 mg of prednisolone on alternate days, 25 mg of losartan, aspirin 150 mg and warfarin 5 mg alternating with 2.5 mg daily.

Discussion

Here we present a case of diffuse endomesangial proliferative glomerulonephritis, who developed a worsening of proteinuria and oedema and development of ascites, a left pleural effusion and splenomegaly, due to IVC and left renal vein thrombosis.

Figure 1. Chest X-ray showing mass in left hemithorax.

Before thrombolysis

Flow restored after thrombolysis

Figure 2. Cavogram showing IVC thrombus.
Renal vein thrombosis in adult patients, with the nephrotic state occurs most commonly with membranous nephropathy, followed by MGN and minimal change disease. Thrombosis may be acute, presenting with flank pain, haematuria and renal failure in younger patients, or chronic with peripheral oedema, an increase in proteinuria, ascites and gradual worsening of oedema. Such patients tend to be older, often have other concomitant thrombi, for instance in the IVC, and a higher incidence of pulmonary emboli.

Anticoagulation, either parenteral or oral, is currently recommended as the first line of therapy for renal vein thrombosis. However, failure of resolution of thrombosis or even worsening, despite anticoagulant therapy have been reported, which were successfully managed by local or systemic thrombolytic therapy.

Systemic treatment with both streptokinase and urokinase have been reported. In these reports, the doses used were: Streptokinase 2.5 lac units bolus followed by 1 lac units/hr for 61 hrs, urokinase 4400 units/kg/hr, for 12 hrs after an equal dose as bolus and then 5000 units/kg bolus and hourly infusion for a further 12 hrs. Bleeding per vagina and subconjunctival haemorrhages were limiting factors in one of the reported cases. Successfully treated IVC and left renal vein thrombosis with 2 successive boluses of tissue plasminogen activator of 15 and 35 mg. but to our knowledge, much lower dose of streptokinase used.

In conclusion, we believe that an invasive technique like venography is justified, as it allows local instillation of thrombolytic agents, followed by verification of the efficacy of the procedure without a fresh puncture. The lower dose of streptokinase used locally is effective; has a lower likelihood of bleeding complications and is more cost effective.

References