Renal Vein Thrombosis in Nephrotic Syndrome

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Renal vein thrombosis is not an uncommon serious complication of nephrotic syndrome. The diagnosis of this condition requires a high index of suspicion from the treating physician. This is because of a few mild symptoms (flank pain and haematuria) and non-specific clinical signs (tenderness with slight enlargement of involved kidney), if present. Renal vein thrombosis carries a high risk of morbidity and mortality but a favorable outcome can be achieved when anticoagulation therapy is started earlier in the course of the disease. We report a 49 year old Bahraini male who presented with nephrotic syndrome and mild left flank pain. A detailed evaluation including selective renal angiogram confirmed the diagnosis of left renal vein thrombosis. This diagnostic entity should be considered in nephrotic syndrome patients with unexplained rapid deterioration of renal function, acute flank pain, macroscopic hematuria, pleuritic chest pain and severe hypoalbuminaemia.

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Renal Vein Thrombosis (RVT) is a well known complication of Nephrotic Syndrome (NS) and has been first described by Rayer in 1840 and since then several hundred cases have been reported[1,2].

The incidence of RVT in nephrotic syndrome varies between 5-62% with an average of 35%. This large variation in incidence is due to the differences in the duration and the magnitude of hypoalbuminaemia[3]. Llach et al[4] studied 151 patients with NS and found 33 (22%) had RVT, the majority of which had membranous nephropathy[2]. Forero et al[4] prospectively evaluated 26 adult patients with idiopathic NS and with no symptoms; all the patients underwent selective renal venogram, and 11 (42%) were found to have RVT.

We report a case of severe nephrotic syndrome secondary to Focal Segmental Glomerulosclerosis (FSGS) complicated by left RVT.

THE CASE

A 49-year old Bahraini male was admitted to the Nephrology Unit at Salmaniya Medical Centre, Bahrain, in September 1996. He complained of progressive generalized oedema of one-month duration and left flank pain of one-week duration. There were no other associated symptoms. On examination, BP was 140/90 mmHg, weight 89 kgs and there was gross pedal and periorbital edema. CVS and respiratory system examinations were normal. Abdominal examination revealed signs of ascites but no signs of peritoneal inflammation and

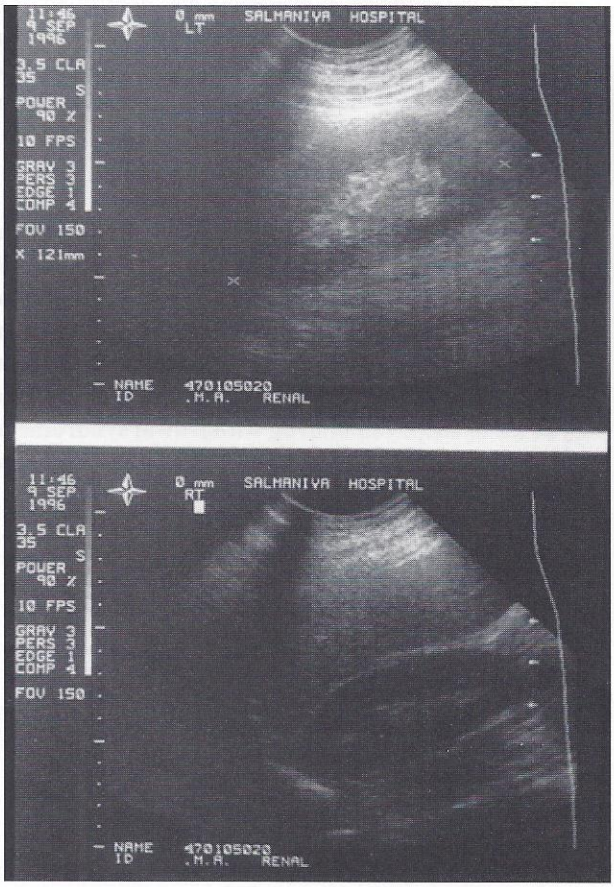

Figure1: Renal sonography showing swollen left kidney

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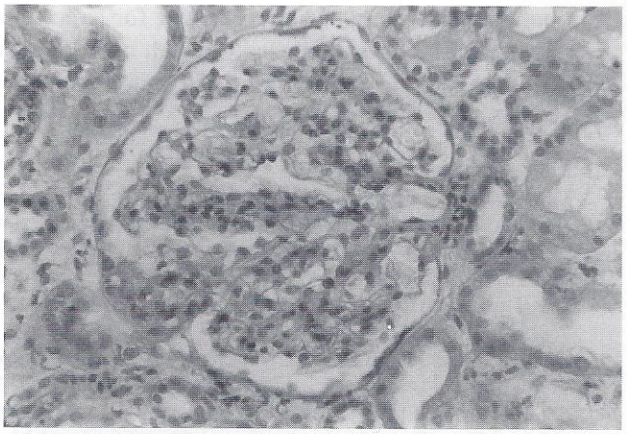

Figure 2. Photomicrograh of one glomerulus showing the segmental mesangial cell proliferantion and sclerosis in the upper half of the picture. An apical adhesion is seen to the right of tuft (H & Ex 132).

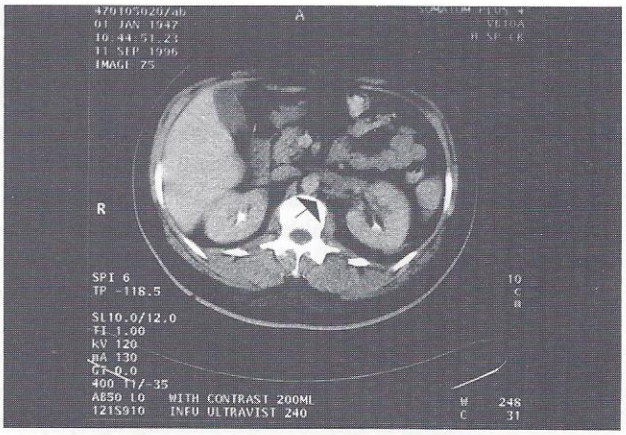

Figure 3: CT abdomen with IV contrast (ultravist) showing swollen left kidney with left RVT (arrow).

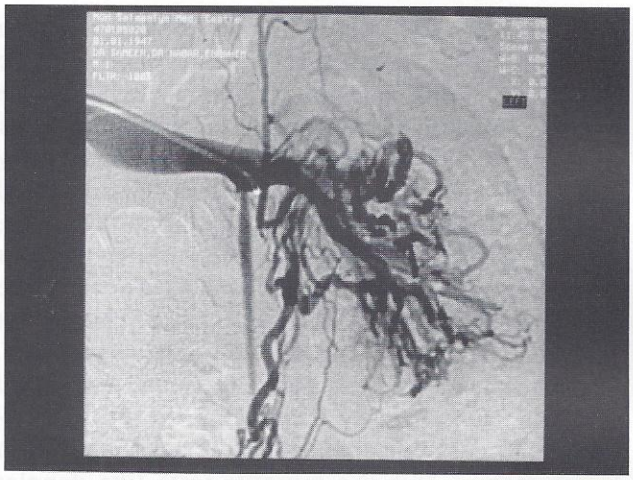

Figure 4: Selective left renal venogram showing thrombus in the left renal vein (arrow).

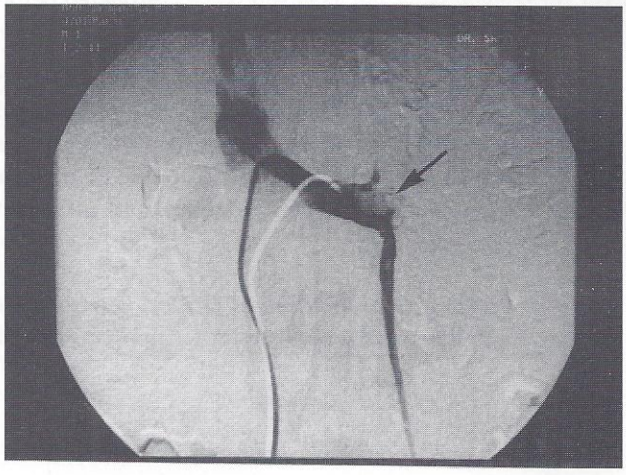

Figure 5:Repeated left renal venogram revealed patent left renal vein (Eighteen months after commencement of anti coagulation).

no organomegaly. Haemoglobin was 11.4 gm/dl, ESR 80 mm/1hr, urea 23 mg/dl, creatinine 0.9 mg/dl, albumin 0.7 gm/dl, globulin 3.4 gm/dl. Electrolytes and liver function tests were normal, Serum cholesterol was 381 mg/dl. Coagulation profile, serum immunoglobulins, connective tissue/vasculitis screens and complement levels were all normal. Urinalysis showed no active sediments and 24 hour urinary protein was 5.67 grams and creatinine clearance was 99 ml/min. Renal sonography showed slightly enlarged and swollen kidneys (left more than right Fig.1). Kidney biopsy showed features consistent with FSGS (Fig.2)

The presence of left flank pain and enlarged left kidney on ultrasound examination raised the clinical suspicion of left RVT. Accordingly, colour Doppler Ultrasound and later contrast CT scan studies of the renal vessels were arranged and these showed features consistent with left RVT (Fig.3). Selective left renal venogram confirmed left RVT (Fig.4). The patient was put on a low protein (0.6 gm/kg/day) and low fat diet. Heparin intravenous infusion was started for seven days to keep Activated Partial Thromboplastin Time (APTT) in the range of 2.5 to 3 times the control, followed by adjusted warfarin dose in order to keep International Normalized Ratio (INR) in the range of 2-2.5. During his 17 days stay in the hospital, the flank pain disappeared gradually and there was a marked improvement in the oedema and ascites. On the day of discharge, his weight was 73 kgs. (16 kgs. weight loss) and he was advised to continue on the following medications: Furesomide 40mg OD, Cibacin 10 mg OD and Prednisolone 1 mg/kg/day. Regular follow-ups in the Out-patient clinic showed stable renal function with marked improvement in the 24-hours urinary protein (0.2-0.4 gm/day) and creatinine clearance (83 ml/min). Values of serum protein, albumin, globulin and lipid profile were within normal limits. Periodic check up with ultrasound doppler studies revealed normal blood flow of the left renal vein[6-8]. Eighteen months later a selective renal venogram confirmed patent left renal vein (Fig.5), when anticoagulation therapy was stopped. In March 1998, repeated 24-hour urinary protein was 0.17 gm/day and creatinine clearance was 105 ml/min[9,10].

DISCUSSION

Thromboembolism is one of the most serious complications of NS. Deep vein thrombosis, pulmonary embolism and RVT are the most frequently reported complications in the adult nephrotic patients. The majority of patients with RVT have either trivial or no symptoms and only a minority

(12%) present with classic symptoms of sudden flank pain, hematuria and deterioration of renal function[11].

There are no specific clinical signs for RVT, but in a small number of patients there is tenderness with slight enlargement of the involved kidney. In fact, the diagnosis of RVT in the past was mainly made in postmortem studies. Intravenous urogram is often unremarkable; it has been reported to be normal in more than 25% of patients[5]. Selective renal venography remains the definitive diagnostic tool, however, it is invasive and costly. There are other non-invasive tests which are of help in the diagnosis of RVT, including doppler sonography, computerized tomography and magnetic resonance imaging. Digital substraction angiography and intrarenal haemodynamic studies are used mainly in research work but rarely in clinical practice.

The incidence of RVT complicating NS is high but the scarcity of symptoms, lack of specific clinical signs and the benign course with anticoagulation therapy brings up the question of how to approach patients with NS looking for possible RVT. Most investigators agree that renal venography should be performed in all nephrotic patients with unexplained rapid deterioration of renal function, acute flank pain, macroscopic hematuria or pluritic chest pain, and patients with membranous nephropathy associated with severe hypoalbuminaemia (serum albumin less than 2 gm/dl)[5]. But screening all adult patients with NS remains unsettled. Digital renal venography is a quick diagnostic method and is perhaps the least costly. It can be carried out as an out-patient procedure but unfortunately it is not available in many centres. But non-invasive tests like doppler ultrasonography, contrast enhanced CT of abdomen, spiral CT for renal vessels and MRI should be considered before any invasive diagnostic intervention.

Treatment of RVT is successful provided, there is early recognition perhaps through screening all adult patients with NS, effective anticoagulation, good patient's compliance, treatment of underlying cause of NS and of associated complications such as hyperlipidaemia and infection.

CONCLUSION

RVT is a serious complication of NS but is associated with few and nonspecific clinical signs. Early recognition is, amongst other things, a prerequisite for successful therapy and this is best achieved through high index of suspicion and the use of imaging, CT-angio being the study of choice.

REFERENCES

1. Markowitz GS, Brignol F, Burns ER, et al. Renal Vein Thrombosis Treated with Trombolytic Thraphy: Case Report & Breif Review. Am J Kidney Dis 1995;25:801-6.
2. Futrakul P, Boonjunwetwat D, Pochanugool C, et al. Renal Vein Thrombosis in a Severe Form of Renal Disease. Am J Nephrol 1995;15:364-6.
3. Harris RC, Ismail N. Extrarenal complications of the Nephrotic Syndrome. Am J Kidney Dis 1994;23:477-97.
4. Llach F, Papper S, Massry SG, et al. The Clinical Spectrum of Renal Vein Thrombosis: Acute and Chronic. Am J Med 1989;69:819-27.
5. Humphreys MH. Thromboembolic disoders of the major renal vessels. In: Brunner BM, Rector FC, Jr (eds). The Kidney. Vol.2. West Washington Square, Philadelphia: WB, Saunders Co, 1981:1750-61.
6. Rostoker G, Durand-Zaleski I, Maadi AB et al. Prevention of Thrombotic Complications of the Nephrotic Syndrome by the low-Molecular - Weight Heparin Enoxaparin. Nephron 1995;69:20-28.
7. Kennedy JS, Gerety BM, Silverman R, Et al. Simultaneous Renal Arterial and Venous Thrombosis Associated with Idiopathic Nephrotic Syndrome: Treatment with Intra-Arterial Urokinase. Am J Med 1991;90:124-127.
8. Forero FV. Idiopthic Nephrotic Syndrome of the Adult with Symptomatic Thrombosis of the Renal Vein. Am J Neprhol 1998;8:457-62.
9. Rowe JM, Rasmussen RL, Mader SL, et al. Successful Thrombolytic Theraphy in Two Patients with Renal Vein Thrombosis. Am J Med 1984;77:1111-4.
10. Burrow CR, Walker WG, Bell WR, et al. Streptokinase Salvege of RenalFunction after Renal Vein Thrombosis. Ann Intern Med 1984;100:231-8.
11. Crowely JP, Matarese RA, Quevedo SF, et al. Fibrnolytic Theraphy for Bilateral Renal Vein Thrombosis. Arch Intern Med 1984;144:159-60.
12. Ross DL, Lubowitz H. Snticoagulation in Renal Vein Thrombosis. Arch Intern Med 1978;138:1349-51.
13. Bennet WM. Renal Vein Thrombosis in Nephrotic Syndrome. Ann Intern Med 1975;83:577-8.
14. De Troyer A, Paduart P, Shockert J, et al. Unilateral Renal Vein Thrombosis And Nephrotic Syndrome. BMJ 1975;27:730-31.
15. Fein RL, Chait A, Leviton A. Renal Vein Thrombectomy for the Treatment of Renal Vein Thrombosis Associated with the Nephrotic Syndrome. J Urol. 1968;99:1-13.