UNIVERSITY OF ROCHESER MEDICAL CENTER

DEPARTMENT OF IMAGING SCIENCES

Imaging Sciences Interesting Cases

CASE 51

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CLINICAL PRESENTATION: Patient is a 19-year-old Puerto-Rican female who presented to the Emergency Department with recurrent right upper quadrant abdominal pain, nausea, vomiting, chills and shortness of breath. During her initial visit several months prior, she underwent an uncomplicated appendectomy. Her laboratory data now reveals a white count of 17,000/uL, a platelet count of 106,000/uL, normal coagulation, an elevated D-dimer of 1,925 ng/mL, a creatinine that increased from 0.5 to 0.9 mg/dL, proteinuria, normal liver function tests and a negative urinary pregnancy test.

IMAGING FINDINGS: Ultrasound with color flow Doppler revealed two right renal veins, with a thrombus extending from the superior right renal vein into the IVC. Contrast-enhanced computed tomography demonstrated the same thrombus within the superior right renal vein extending into the IVC. A wedge-shaped low attenuation area is noted in the superior pole, suggestive of ischemia secondary to outflow obstruction. After one month of coumadin therapy, the renal vein and IVC thrombosis resolved.

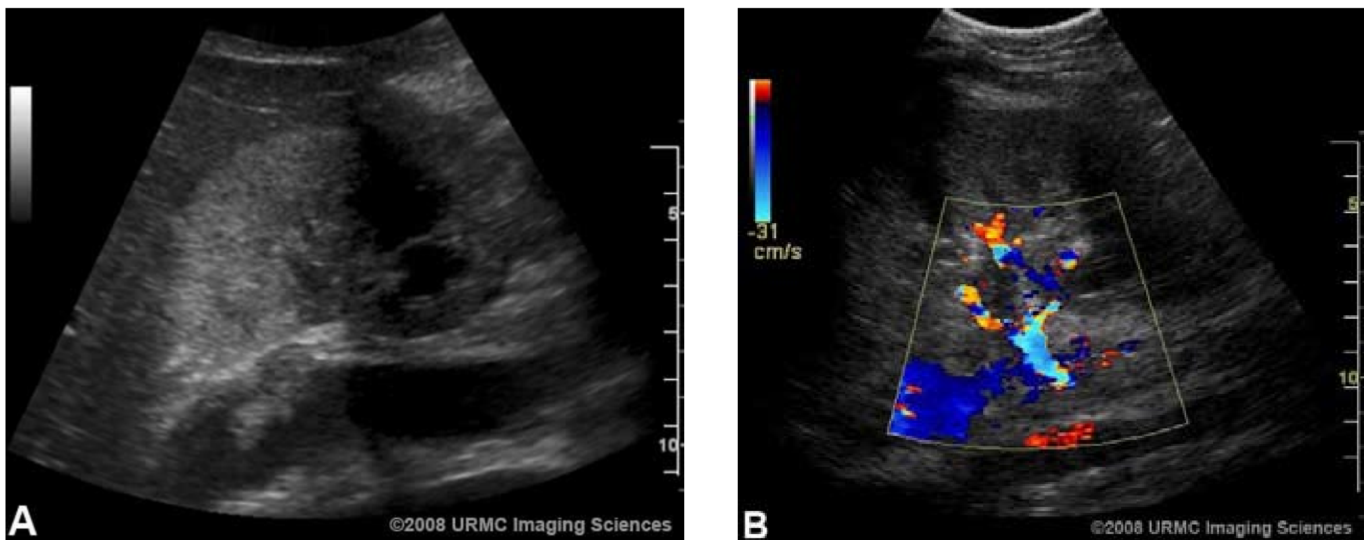

Figure 1: Longitudinal grayscale (**A**) and color flow Doppler (**B**) images of the right kidney demonstrates a hyperechoic thrombus extending from the superior renal vein into the IVC.

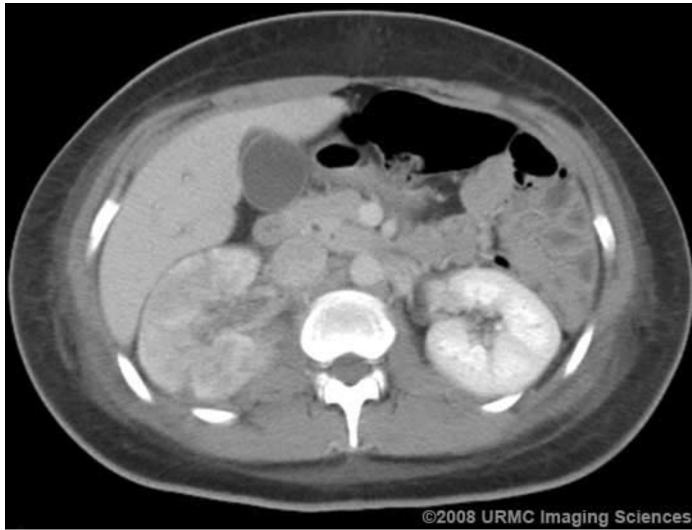

Figure 2: Contrast-enhanced axial CT demonstrates the same thrombus within the right superior renal vein extending into the IVC. Note the wedge shaped low attenuation area in the upper pole.

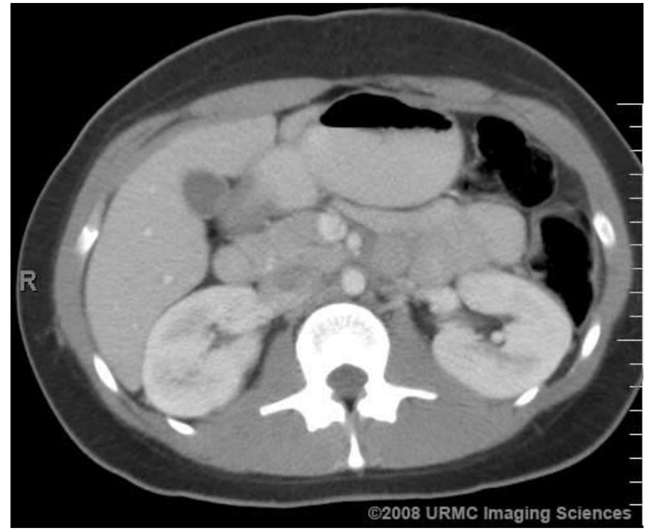

Figure 3: Contrast-enhanced axial CT one month following therapy exhibits resolution of renal vein and IVC thrombosis.

DIAGNOSIS: Renal vein thrombosis

DISCUSSION: Although once believed to be an uncommon condition associated primarily with nephrotic syndrome, renal vein thrombosis in adults is now known to be associated with a wide range of local and systemic diseases. The incidence of renal vein thrombosis is likely underestimated, as the majority of events are sub-clinical or present only as nephrotic syndrome.

Nephrotic syndrome is the most common cause of renal vein thrombosis in adults, of which membranous glomerulonephropathy is the most common. Trauma, infection, tumor, pregnancy or systemic disease also predispose patients to develop renal vein thrombosis. Renal cell carcinoma often extends intraluminally into the renal vein. Conditions which decrease renal vascular flow, such as dehydration and sepsis, are more likely to cause renal vein thrombosis in neonates and infants. Coagulation derangements secondary to oral contraceptives, polyarteritis nodosa, sickle cell anemia and antiphospholipid syndrome have all been reported to cause renal vein occlusion.

Clinical features of acute renal vein occlusion include flank pain, nausea, vomiting, palpable lumbar mass, hypertension, renal failure and hematuria. Patients with chronic renal vein thrombosis may be asymptomatic, or exhibit proteinuria. Some patients present with pulmonary embolism.

In the acute phase, ultrasound may detect an enlarged kidney with decreased echogenicity and thrombus within the vein. Over time, the echogenicity of the cortex may increase with preservation of corticomedullary differentiation. Late findings demonstrate decreased renal size and loss of corticomedullary differentiation. Color flow Doppler may reveal absence or decreased flow within the vein, turbulent flow within narrowed portions of a partially obstructed vein, and loss of normal venous phasicity.

Contrast-enhanced CT may demonstrate a filling defect within the vein, enlargement of the affected kidney, bulging contours of the thrombosed vein, and abnormal enhancement patterns, including delayed cortical nephrogram and prolonged retention of contrast compared to the contralateral kidney.

This patient's laboratory evaluation revealed a positive anti-lupus antibody. Her recurrent abdominal pain may have been secondary to multiple thromboembolic episodes due to an antiphospholipid syndrome.

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