## Intrahepatic extension of renal cell carcinoma tumor thrombus causing Budd-Chiari syndrome

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A 66-year-old woman presented with a 10-day history of progressive shortness of breath, epigastric pain and 10-pound weight loss. Physical examination revealed a palpable mass involving the right upper quadrant. Computed tomography (CT) of the abdomen demonstrated a  $6.8 \times 8.8 \times 7.5$  cm right renal mass with tumour thrombus extending into the inferior vena cava and right atrium (Fig 1). In addition, the tumour extended retrograde into the right hepatic vein, associated with abnormal attenuation in the right lobe of the liver on the CT scan of

the abdomen (Fig 2). This obstruction caused Budd-Chiari syndrome, associated with abnormal liver function tests and ascites. Alanine transferase, aspartate trasnferrase, alkaline phosphatase and gamma-glutamyl transpeptidase levels were 946, 1047, 396 and 203 U/L, respectively. The bilirubin level was 76 umol/L and the international normalized ratio was 1.5.

The patient underwent right radical nephrectomy, cardiopulmonary bypass and caval thrombectomy with right hepatic venotomy. Notably, the thrombus slid out of the hepatic vein without evidence of hepatic attachment or infiltration (Fig. 3).



*Fig. 1.* A: Coronal computed tomography image of thorax/abdomen/pelvis with intravenous contrast demonstrating a large tumour thrombus extending into the right hepatic vein (double arrows) and just below the right atrium (single arrow). B: Sagittal view showing tumour thrombus above the diaphragm.



*Fig. 2.* A: Axial computed tomography image of tumour thrombus extending into the right hepatic vein. Arterial phase scan demonstrates enhancement of the tumour in the inferior vena cava and of the tumour extension into the right hepatic vein (red arrow). B: Portal phase scan demonstrates decreased attenuation of liver parenchyma in the right lobe compared to the left lobe (blue arrow), and tumour thrombus extension into the hepatic vein (red arrow).

Final pathology revealed Fuhrman 3 clear cell renal cell carcinoma with negative margins (T3cN0M0). She was reimaged with thoracic and abdominal CT scanning and is free of disease 4 months postoperatively. Liver function tests have also normalized. This paper has been peer-reviewed.

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*Fig. 3.* Tumour thrombus with extension into the right hepatic vein (blue arrow) and associated bland thrombus (red arrow). The thrombus slid out of the vein without evidence of hepatic attachment or infiltration.