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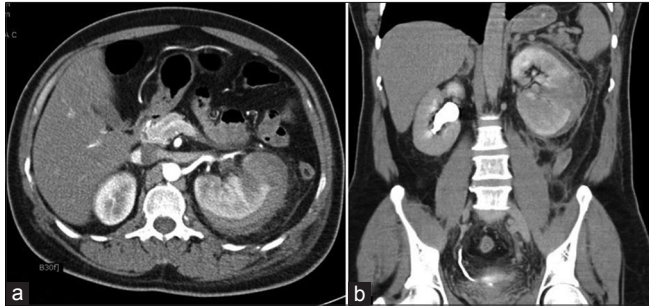
### **Spontaneous rupture of renal cell carcinoma: A series of three cases**

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Dear Editor,

Renal cell carcinoma (RCC) is the most common malignant tumor of the kidney. Presentation of RCC as spontaneous

renal hemorrhage is uncommon. It is possible to determine the etiology by contrast-enhanced computed tomography (CECT) or magnetic resonance imaging (MRI); sometimes it presents a diagnostic and therapeutic dilemma. A variety of causes (neoplasm, vascular abnormality, and renal parenchymal disease) have been described. Occult RCC is considered to comprise up to 50% of causative etiology.



**Figure 1:** Contrast-enhanced computed tomography images showing left perinephric hematoma with intact renal arteries in the arterial phase. The delayed image showing left perinephric hematoma with a breach in the parenchyma at the level of the midpole

A 49-year-old man presented with left flank pain. Ultrasound revealed a large left perinephric hematoma measuring 6 × 7 cm. After initial resuscitation and blood transfusion, CECT confirmed a perinephric hematoma. Main renal vessels were normal, delayed images showed no extravasation [Figure 1a and b]. Patient was taken up for emergency exploration. After vascular control, a large perinephric hematoma and a midpolar tumor measuring 4 × 4 cm was seen. Subsequently, nephrectomy was performed. Pathology revealed papillary RCC [Figure 2].

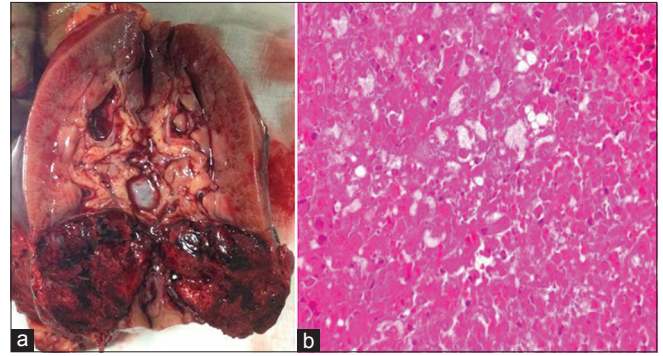
A 43-year-old teacher, hypertensive, presented with left flank pain since a month. CECT showed a perinephric hematoma of the left kidney. A large perinephric hematoma was seen compressing the kidney during exploration. After evacuation of clot, a tumor was seen in the upper pole. This patient underwent radical nephrectomy. The histopathology was consistent with clear cell type of RCC.

A 25-year-old male engineer, was found to have a complex cyst in the right kidney during evaluation of hypertension. The cyst contents showed enhancement on the CECT. MRI showed features of solid contents within the cyst. Nephrectomy and partial nephrectomy were offered. Patient opted for radical nephrectomy. Histopathology revealed clear cell RCC.

RCCs are now discovered as ‘incidentalomas’ in contrast to the classic presentation.<sup>[1]</sup> The spontaneous bleeding of the kidney (subcapsular and/or perinephric space) was first described by Carl Reinhold August Wunderlich.<sup>[2]</sup> Wunderlich syndrome is uncommon and most of the causes are benign.<sup>[3]</sup> In a review, 70% were due to benign causes, including vascular disease, infection, and neoplasia. Neoplastic causes accounted for 61.2% of these cases.<sup>[4]</sup>

Immediate surgery<sup>[5]</sup> or embolization are the options<sup>[6]</sup> based on patient’s general condition. Once the patient’s condition is stabilized, embolization is prudent. Else an immediate exploration seems appropriate.

CECT is the most reliable modality in diagnosing retroperitoneal hemorrhage and RCC.<sup>[7]</sup> However, the efficiency of CT to diagnose RCC at the time of bleeding is an area of concern. Kendall *et al.*, found that 60% of subjects showed RCC undiagnosed at the time of initial CT.<sup>[8]</sup> After initial CT evaluation, radical nephrectomy is the treatment of choice for tumors diagnosed as malignant



**Figure 2:** Gross photograph showing tumor in lower pole with extensive hemorrhage on cut surface. Histomicrophotograph showing tumor cells in clusters (H and E, ×100)

and embolization may be the modality of choice for benign conditions. If malignancy is found on the follow-up CT, delayed surgery would affect the resectability, clinical staging, and outcomes.<sup>[9,10]</sup>

Wunderlich syndrome is a rare phenomenon that usually occurs due to benign causes, but a significant proportion, are associated with malignancy. Underlying malignancy may be missed on initial CT. One must, therefore, be aware of the possibility of a malignant etiology. The cornerstone of successful management includes initial resuscitation, embolization, and nephrectomy. Where RCC is diagnosed on initial CT, immediate embolization or early resection, depending on the patient’s condition, is a safe and reasonable approach.

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