

Emergency ultrasound diagnosis of traumatic renal cyst rupture

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Abstract Renal cyst rupture secondary to trauma is a rare occurrence. A case is reported of a ruptured renal cyst after a fall in a 79-year-old man with a history of multicystic kidney disease. The focused sonographic findings of the renal cyst rupture are described.

Keywords Ultrasound · FAST · Trauma · Renal cyst rupture · Emergency

Case report

A 79-year-old man presented to the emergency department complaining of right flank pain after falling down two stairs. His past medical history was significant for multicystic kidney disease, chronic renal failure, hypertension, and abdominal aortic aneurysm repair. The patient's vital signs were stable. On physical exam, his right flank and right posterior chest wall were tender, but no crepitus, deformity, or ecchymosis was noted, lungs were clear and equal bilaterally, and the abdomen was soft without tenderness.

A focused assessment with sonography for trauma (FAST) examination was performed by the emergency physician using a 5–2 MHz curvilinear array transducer

(Philips EnVisor, Andover, MA), and revealed multiple large cystic structures associated with both kidneys. An anechoic collection was noted posterior and medial to the right kidney and contiguous with a cyst, but did not track into Morison's pouch (Fig. 1; Online Resource 1).

Results and discussion

A subsequent computed tomography scan of the abdomen confirmed a ruptured right renal cyst with associated retroperitoneal fluid posterior to the right kidney (Fig. 2). No intra- or extra-renal hemorrhage was noted. The patient was admitted by the Trauma Surgery service for observation and had an uncomplicated hospital course.

While experimental models have suggested that the presence of renal cysts and hydronephrosis increase the likelihood of renal injury in blunt trauma [1], reports of

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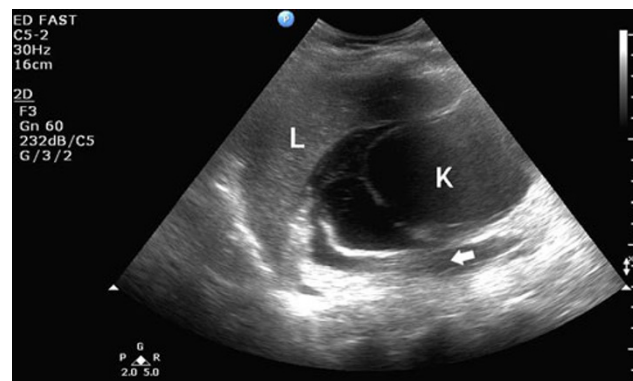
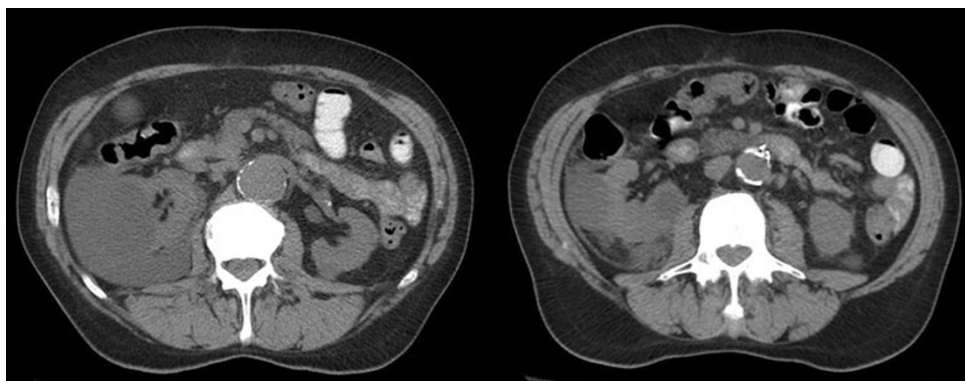


Fig. 1 Coronal view of the right hepatorenal window illustrating the liver (L), the kidney (K) with multiple renal cysts, and an anechoic area consistent with retroperitoneal free fluid (arrow). Note that it is continuous with one of the renal cysts

Fig. 2 Transverse views of the computed tomography scan of the abdomen, illustrating right renal cysts with surrounding soft tissue stranding and retroperitoneal fluid



posttraumatic renal cyst rupture is rare [2–5]. Rupture into the pyelocalyceal system, retroperitoneum, peritoneum, and perinephric and subcapsular spaces have been described [3]. Ruptures can occur secondary to a direct blow or a counter coup effect [6], and present with hematuria, abdominal or flank pain, or ecchymosis [2, 3]. Unless associated with vascular hemorrhage, treatment is usually supportive [5].

This case illustrates that although free retroperitoneal fluid is not conventionally seen with FAST examinations, it is important to recognize when it is present. When visible, retroperitoneal fluid tends to be located at the site of injury [7]. Initially fluid may appear to be in Morison’s pouch, but on careful inspection it is seen confined beneath Gerota’s fascia. This fascia, together with perinephric fat, appears as an echogenic line that outlines the renal cortex. Retroperitoneal fluid may also appear as an anechoic or hypoechoic area surrounding the kidney. Examination of the retroperitoneum, while not sensitive, may also be of utility when there is concern for abdominal aortic aneurysm (AAA) rupture, as most ruptured AAAs leak into the retroperitoneum. A retroperitoneal hematoma may also be seen as a heterogenic, usually hyperechoic, collection on either side of an aneurysm, with concomitant displacement of the ipsilateral kidney anteriorly [8].

Further, as seen in this patient, it is also helpful to understand that not all abnormal anechoic findings on a FAST examination necessarily represent blood. In addition to renal cyst rupture, a urinoma can occur secondary to calyceal rupture from nephrolithiasis or trauma, and appears as an anechoic rim around the kidney when urine leaks out between the renal capsule and Gerota’s fascia.

This finding may also be associated with a hematoma or ascites [9].

Conflict of interest None.

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