



## Ureteropelvic junction obstruction causing a spontaneous collecting system rupture: A case report and review of the literature

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### ABSTRACT

Stones are the most common cause of collecting system ruptures. There are few reported cases of a ruptured collecting system without an underlying pathological cause. We report a case of a 15-year-old female patient who presented with left flank pain that was associated with nausea and vomiting. Computed tomography revealed a large, left retroperitoneal fluid collection, which was associated with severe hydronephrosis without an obvious pathological cause. The patient was treated with the insertion of a left double-J stent, and a retrograde pyelography confirmed the cessation of extravasation. At follow up, she was treated surgically with left robotic-assisted pyeloplasty without complications.

### 1. Introduction

Spontaneous rupture of the collecting system is an extremely rare condition that may have several etiologies. Intrinsic pathologies causing acute obstruction, including stones and tumors, are the most common causes of rupture. Extrinsic pathologies causing gradual and chronic obstruction are reported less frequently.<sup>1</sup> Rupture of the collecting system is diagnosed radiologically as a urinary extravasation of the normal excretory tract with possible collection in the retroperitoneal space. Interestingly, most reports of ruptured collecting systems involve ruptures located near the ureteropelvic junction.<sup>2</sup> We report a case of spontaneous rupture of the collecting system due to ureteropelvic junction obstruction (UPJO) in a young female patient.

### 2. Case presentation

A 15-year-old female with no past surgical or medical history presented to the emergency department (ED) complaining of severe left flank pain that had gradually worsened throughout the day. The pain radiated to the left groin and was associated with nausea and vomiting.

The patient had no fever, hematuria, or dysuria. She had a similar illness 1 year prior but did not seek medical attention at that time. Her vital signs were stable. A physical examination was unremarkable, apart from left flank tenderness. The patient's laboratory workup was unremarkable.

An enhanced computed tomography (CT) scan of the abdomen and pelvis revealed a rupture of the left collecting system with a large retroperitoneal urinoma associated with severe hydronephrosis (Fig. 1A and B). There was no obvious underlying pathology on CT. The patient underwent an urgent insertion of a double-J stent in the left ureter. Retrograde pyelography showed ballooning of the renal pelvis without extravasation, while there was narrowing of the ureteropelvic junction, suggestive of UPJO (Fig. 2). We kept the stent for one year due to Corona virus pandemic crisis until we did left robotic-assisted pyeloplasty. Intraoperatively, we found an accessory, crossing vessel which seems to be the cause of UPJO. We dismembered the renal pelvis and the stent was removed. The ureter was brought above the crossing vessel with a new stent that was inserted in. After that, the stent was kept, and removed after 2 months from the repair.

*Abbreviations:* CT, computed tomography; ED, emergency department; UPJO, ureteropelvic junction obstruction.

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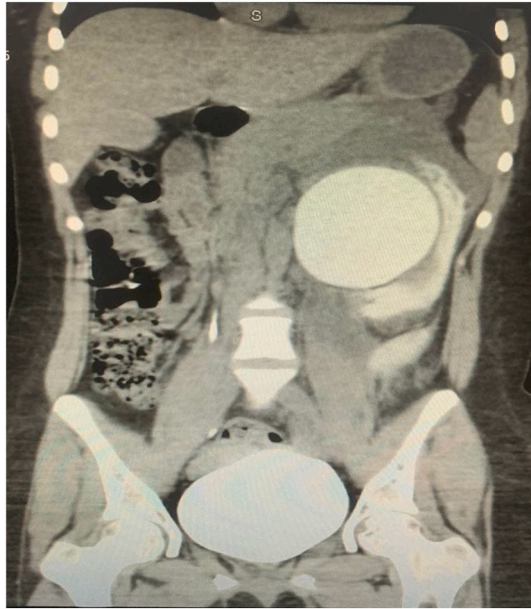
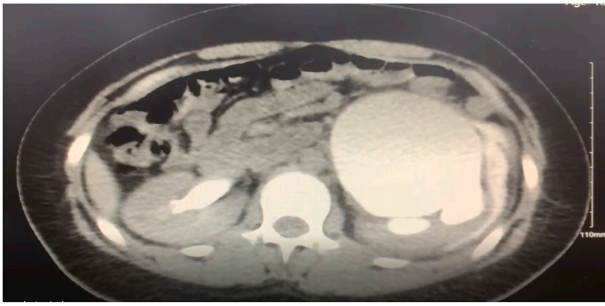
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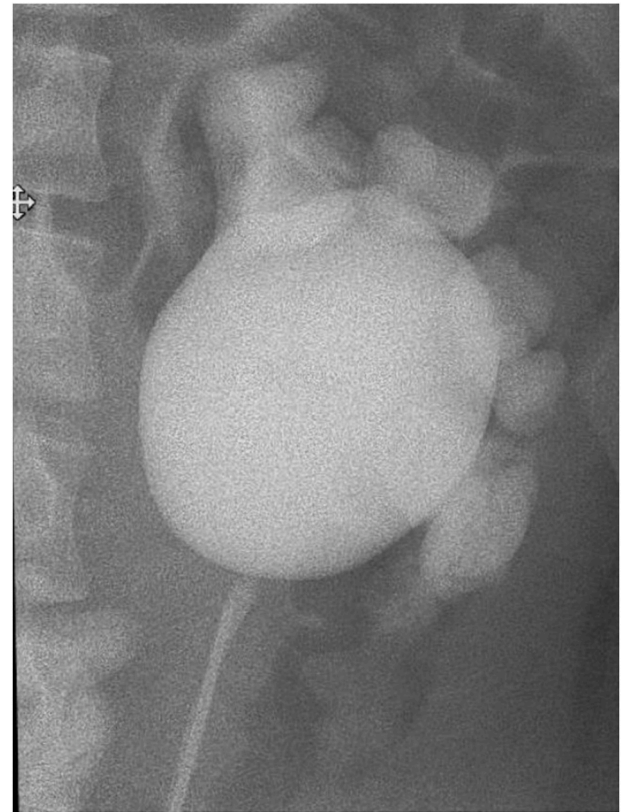
**Fig. 1.** A, B: Enhanced CT scan with delayed images showed left ureteric junction rupture with large retroperitoneal extravasation of contrast.

### 3. Discussion

Collecting system ruptures are thought to be the result of increased ureteral pressure caused by urine backflow secondary to intrinsic or extrinsic pathologies. Rupture symptoms are not specific. A contrast-enhanced CT scan with delayed imaging is the most effective radiological investigation to diagnose a collecting system rupture as it reveals the extravasation of contrast.

Cases of spontaneous collecting system ruptures are underreported in the literature. In addition, UPJO is a rare cause of such a condition that may occur even at a young age. Gershman et al. evaluated 108 patients diagnosed with renal fornical rupture and found only two cases (1.8%) due to UPJO.<sup>1</sup> Ashebu et al. reported the case of a 46-year-old male patient with a history of progressive left flank pain associated with vomiting, constipation, and urinary retention.<sup>3</sup> CT demonstrated contrast extravasation and the exact site of rupture.<sup>3</sup> Ferri et al. reported a case of spontaneous renal pelvic rupture in a 46-year-old male patient with sudden left flank pain.<sup>4</sup> Enhanced CT scan showed contrast extravasation but no signs of obstruction or any underlying cause.<sup>4</sup> These previously reported cases were all managed via the insertion of a double-J stent, which resulted in the cessation of contrast extravasation on CT and helped restore the normal urinary tract.

Similar to our case in presentation and management, Eken et al. described a 29-year-old man who presented to the ED with severe left flank pain and chills. Enhanced CT showed extravasation of contrast around the left proximal ureter and ureteropelvic junction. The patient was managed with the insertion of a double-J stent that was removed after 1 month without known complications. Follow-up with retrograde



**Fig. 2.** Left retrograde pyelography showed ballooning of the renal pelvis without extravasation after insertion of double-J stent.

pyelography revealed no extravasation.<sup>5</sup>

As indicated by our brief review of the literature, the insertion of a double-J stent appears to be the gold standard treatment in acute cases of spontaneous collecting system ruptures. The timing of the removal of the double-J stent should be based on clinical, radiological, and operative findings.

### 4. Conclusion

Symptoms of collecting system ruptures are not specific and can mimic several other conditions. Thus, early recognition with imaging, especially enhanced CT, aids in the diagnosis of this condition. Insertion of a double-J stent helps restore the normal urinary excretory tract and resolves the extravasation. When present, a UPJO should be repaired prior to the development of collecting system ruptures.

### Author statement

Abdullah Alkhayal: Conceptualization, Methodology, Supervision. Fawaz Alkeraith: Writing – original draft. Hammam Alkanhal: Writing – original draft. Omar Alfradi: Editing. Khalid Alrabeeh: Supervision. Saad Abumelha: Supervision.

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### Declaration of competing interest

None.

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