



## Case Report

# Spontaneous distal ureteric rupture: A rare case report and review of literature



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### KEYWORDS

Spontaneous;  
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**Abstract** Spontaneous rupture of the ureter is a very interesting and unusual phenomenon which normally occurs due to ureteral obstruction. We present a case of spontaneous rupture of the distal ureter, secondary to a ureteric calculus. Our patient presented with a history of acute on chronic abdominal pain and was septic on arrival to hospital.

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## 1. Introduction

Spontaneous ureteric rupture is an extremely rare condition in which there is evidence of urine extravasation from the ureter. Published cases have reported pregnancy, ureteral strictures, tumours, bladder outlet obstruction and retroperitoneal fibrosis among the contributing causes [1]. Majority of reported incidents generally involve the proximal ureter, renal fornix or pelviureteric junction [2]. Only hypothetical causes have been suggested and thus, there are no recommended guidelines to aid management. Management principles are based on the current condition of the patient including diversion of urine, management of sepsis, followed by definitive treatment. Placements of

double-J stents or percutaneous nephrostomy for drainage provides excellent results in the unwell patient, until definitive surgery can be performed. Conservative management with antibiotics is recommended. Improved nutritional status of the patient is imperative for post-operative recovery. We describe the first reported case of spontaneous distal ureteric rupture, secondary to a ureteric calculus.

## 2. Case report

A 48-year-old female presented to the Emergency Department with left lower quadrant abdominal pain. Her symptoms have been gradually increasing in intensity over the last few months. Apart from a previous diagnosis (5 years ago) of a 4 cm benign uterine fibroid on ultrasound, she had no significant medical history. Examination of her abdomen revealed localised tenderness at the left lower quadrant with a palpable mass. Laboratory evaluation showed evidence of leukocytosis (white blood cell count [WBC]

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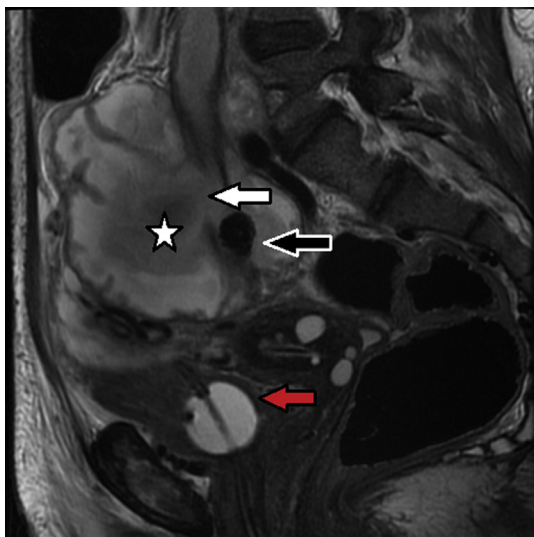
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$15.99 \times 10^9/L$ ) with neutrophilia ( $12.87 \times 10^9/L$ ). Her C-reactive protein (CRP) was raised at 300 mg/L, with total albumin of 19 g/L. Urine microscopy and renal function were unremarkable. An ultrasound was obtained immediately, which showed a large adnexal mass measuring 9.5 cm  $\times$  7.9 cm  $\times$  7.9 cm with cystic and solid components. Left sided moderate hydronephrosis was evident as well. She was placed on antibiotics and an urgent magnetic resonance imaging (MRI) scheduled.

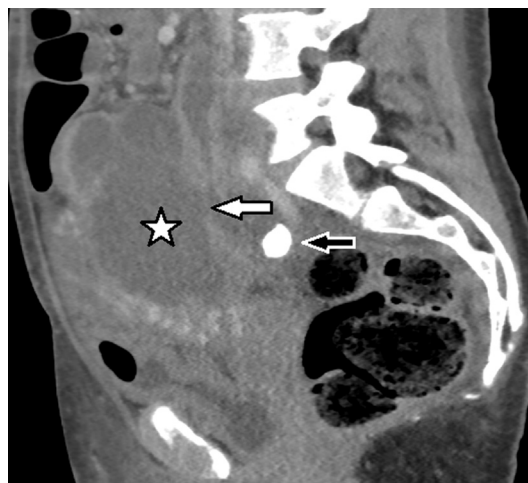
MRI showed a large multiloculated cystic collection with evidence of a calculus 1.5 cm  $\times$  1.3 cm below it (Fig. 1). A large urinoma was also seen surrounding the ureter while the left kidney showed marked loss of parenchyma and severe hydronephrosis. A pigtail drain was also inserted into the cystic collection, followed by insertion of a percutaneous nephrostomy. Frank pus was aspirated from the renal pelvis, which cultured *Streptococcus anginosus*. Culture from the collection grew *Streptococcus anginosus* and *Peptoniphilus accharolyticus*. A computed tomography (CT) scan was obtained 2 days following the MRI (Fig. 2).

A nephrostogram was performed 2 days later, which revealed contrast leaking from the distal ureter into the large cystic space (Fig. 3). No contrast was seen draining into the bladder. A follow-up CT scan after 3 days showed resolution of the left hydronephrosis and decrease in the size of pelvic collection. Her WBC and CRP improved with antibiotic treatment.

Following that, a dimercaptosuccinic acid (DMSA) renogram demonstrated that the left kidney had approximately 9.5% differential function. Options of treatment were discussed with the patient including longer term nephrostomy or delayed nephrectomy. Rationale for delayed nephrectomy was to allow resolution of chronic sepsis and improvement in physiological status of the patient. She was discharged on oral antibiotics, nutrition supplements, free draining nephrostomy tube and an open left nephrectomy



**Figure 1** High resolution sagittal T2 weighted magnetic resonance imaging showing the urinoma (star) and the ureteric wall disruption (white arrow). The stone (black arrow) and bladder with an in dwelling urinary catheter (red arrow) are highlighted.



**Figure 2** Delayed contrast enhanced computed tomography 2 days following the magnetic resonance imaging showing the posterior displacement of the stone (black arrow) and the urinoma (star). The site of the rupture is highlighted (white arrow).

planned. Her CRP and total albumin improved to 21 mg/L and 25 g/L respectively on discharge.

The procedure was performed electively once her overall condition improved. Intraoperatively, the simple nephrectomy had similar features to a nephrectomy performed for



**Figure 3** Nephrostogram obtained 3 days following percutaneous nephrostomy tube (arrow) insertion and drainage of pelvic/retroperitoneal collection, showing ureteric disruption with extravasation of contrast (star).

xanthogranulomatous pyelonephritis. Due to this intra-operative finding, we opted not to pursue her distal ureteric stone (which was in her pelvis) minimizing morbidity from the procedure. Her post-operative course was uncomplicated, and she made excellent recovery. She was discharged on day 3 post surgery, with no further antibiotics. She was given advice on stone prevention and a plan for early intervention if she has recurrence of stone disease. We intend to explore her pelvis and remove the extramural ureteric stone, should she develop a recurrence of a pelvic abscess? Sections of the nephrectomy specimen showed features in keeping with chronic pyelonephritis. Renal parenchyma shows distortion of architecture by interstitial scarring and chronic inflammatory infiltrates. Foci of xanthogranulomatous inflammation were also noted.

### 3. Discussion

Spontaneous ureteric rupture is a rarely described medical event which is challenging to diagnose. Urinoma or abscess formation may ensue, eventually leading to sepsis and death. Hale et al. [3] reported a case of mid-ureteral rupture secondary to traumatic urethral catheterization. The definition of “spontaneous” has not been properly established but our patient has never had previous ureteric instrumentation, kidney/abdominal surgery or a history of external trauma. However, the presence of obstructive pyonephrosis could also be secondary to a ureteral lesion, which may eventually lead to ureteric rupture and extravasation of pus.

Due its rarity, there are no recommended guidelines to direct management. Successful methods have been described which include retrograde insertion of a double-J ureteric stent and/or nephrostomy tube drainage both with the concurrent use of antibiotics [2,4]. These conduits normally remain *in situ*, until definitive surgery can be performed. For cases with no known causes, conduits are removed once patients’ clinical state improves with imaging consistent with resolution [5]. In general, prompt intervention will reduce both mortality and morbidity. Nevertheless, the general principles of controlling sepsis take precedence prior to definitive surgery.

In our patient, we elected for initial conservative management which included insertion of both percutaneous

nephrostomy tube and a pig tail drain into the collection, along with an extended course of antibiotics. Subsequently, an antegrade study via the nephrostomy tube was performed to characterize and pinpoint the rupture. Finally, definitive treatment with nephrectomy was chosen due to the minimally functioning obstructed kidney, which would have predisposed her to urosepsis.

### Author contributions

*Study design:* Li Sian Low, Shiva Madhwan Nair.

*Data acquisition and analysis:* Li Sian Low.

*Drafting of manuscript:* Li Sian Low.

*Critical revision of the manuscript:* Shiva Madhwan Nair.

### Conflicts of interest

The authors declare no conflict of interest.

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