

Spontaneous partial rupture of the upper renal tract

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ABSTRACT

Spontaneous partial rupture of upper renal tract is rare and is usually associated with urolithiasis. Other causes include instrumentations, trauma, pelvic cancer, retroperitoneal fibrosis, fluid overload, and pregnancy. We report two cases (46-year-old and 41-year-old men) of upper renal tract rupture. The first case had rupture of the ureter proximal to stone impaction and the second case had fornicial rupture secondary to stone impaction at the uretero-vesical junction. In contrast to ureteral rupture, fornicial extravasation is more common and the symptoms are always mild. The mechanism of ureteral rupture can be explained as either pressure around the ureteral wall due to stone impaction, or a tear caused by pressure during the passage of the stone. Fornicial rupture occurs when intra-pelvic pressure is greater than 35cm H₂O. It is important to distinguish true rupture of the ureter from fornicial tear with extravasation, because both the outcome and treatment are different.

Keywords: Intravenous urethrography, ureter, spontaneous disruption

INTRODUCTION

Spontaneous partial rupture of the upper renal tract is rare and is usually associated with urolithiasis as stone disease is a common urinary disorder.¹⁻³ Other causes of spontaneous rupture of the renal tract include instrumentations, trauma, pelvic cancer, retroperitoneal fibrosis, fluid overload, and pregnancy.⁴⁻¹¹ It is important to distinguish true rupture of the ureter from fornicial tear with extravasations, because both the outcome and treat-

ment are different. We report two cases (46-year-old and 41-year-old men) of spontaneous rupture of the upper renal tract rupture.

CASE REPORTS

Case 1: A 46-year-old man was admitted with sudden onset of left loin pain of short duration. There was no past history of similar pain or any other relevant medical illnesses. He was afebrile but had marked tenderness on the left loin. Routine blood and urine investigations revealed normal results. Urine culture did not yield any growth. A plain kidney, ureter and bladder (KUB) radiography did not show any radio-opaque abnormalities.

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Ultrasound scan of the abdomen showed mild left hydronephrosis, probably due to left ureteral calculus. An intravenous urogram (IVU) showed left upper ureteral rupture with extravasation of contrast and a distal left ureteral calculus (Figure 1). The contrast was also seen to have passed down into the left ureter. The renal parenchyma on the left side was intact. The right kidney was normal.

The patient underwent left ureteroscopy with extracorporeal hydraulic lithotripsy (EHL) followed by placement of a DJ stent. His condition improved and the stent was removed two weeks later. He remained well without further complication.

Case 2: A 41-year-old male was admitted following a few hours history of right loin pain that radiated down to the groin and the right scrotum. He had had similar pain three days previously. There were no other urinary complaints or relevant past medical illnesses.

He was afebrile with normal vital signs. However, he had tenderness over the right side of abdomen and right renal angle. The scrotum was tender but there was no oedema or swelling.

Investigations done on admission showed leukocytosis at 15.6×10^9 (normal range 4 to 11×10^9). Urine microscopy revealed red blood cell count at 21-30 /hpf, white blood cell count at 4-10/hpf, significant bacteria++ and negative results for nitrites. The renal function was normal. A plain KUB radiography showed a small radio-opaque shadow at the ureteric-vesico (UV) junction consistent with a stone. An IVU showed normal left side excretion. Both renal size and shape were normal. There was evidence of peri-renal leakage of contrast into Gerota's fascia which tracked down to the ureter. There was grade II calyectasis of the right renal collecting system.

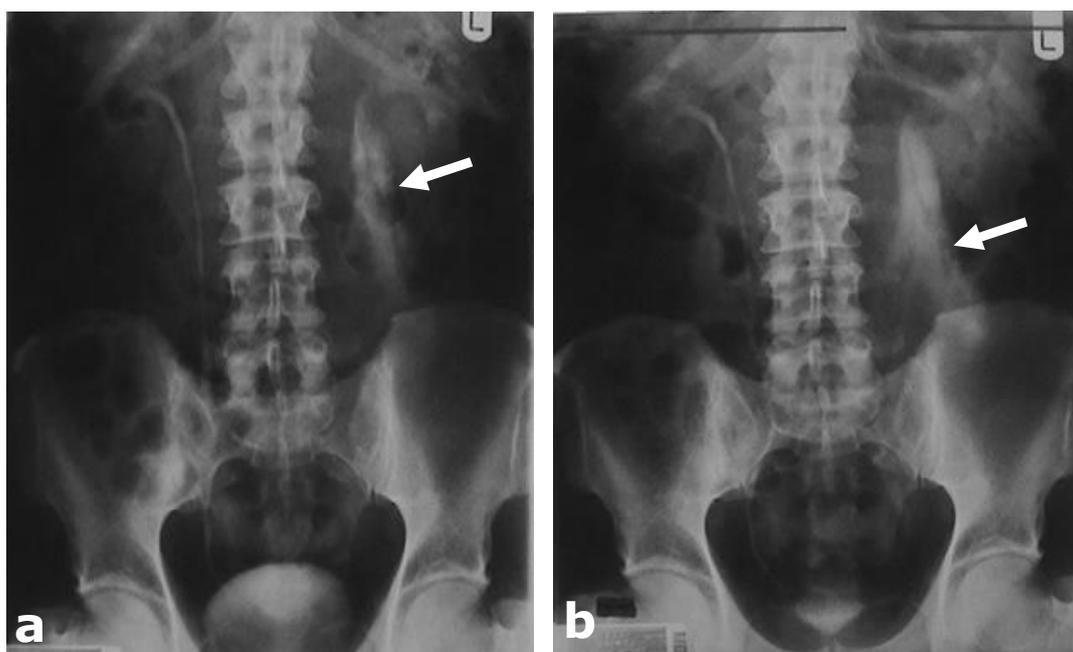


Fig 1: a) Intravenous pyelogram showing contrast extravasations (arrow) from the left upper ureter with a normal right system, b) delayed film showing increase in contrast extravasations.

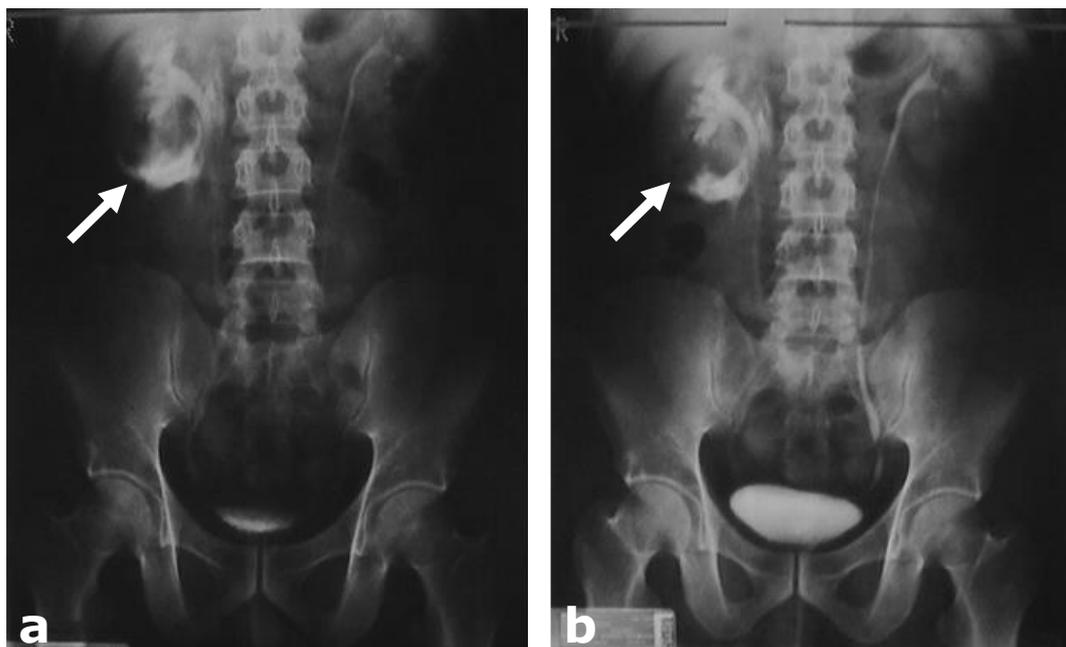


Fig 2: a) Intravenous pyelogram show contrast extravasations (arrow) from the right upper ureter with a normal left system, and b) delayed film showing no increase in extravasations.

His treatment consisted of antibiotic therapy followed by attempted DJ stent placement. During ureteroscopy, the stone was dislodged upwards during manipulation. Insertion of a stent proved to be unsuccessful due to oedema at the site of calculus. Despite this, his condition settled with conservative treatment. Unfortunately, the patient defaulted at follow-up.

DISCUSSION

Spontaneous rupture of the ureter is rare and diagnosis requires that trauma, recent cystoscopic ureteral manipulation, external compression, destructive kidney disease, and previous surgery be excluded.¹² The most common aetiology is concrement in the ureter (ureteral stone) or pylon.¹⁻³ Rupture in association with diagnostic procedures^{4, 5}, trauma⁶, pelvic cancer⁷, retroperitoneal fibrosis⁹, fluid overload¹⁰ and pregnancy have been reported.¹¹ The mechanism of ureteral rupture is ascribed to either to pressure ex-

erted around the ureteral wall (caused by obstruction) or a tear (caused by pressure during stone passage).¹¹ Fornicial rupture occurs when the intra-pelvic pressure rises to greater than 35 cm H₂O. Peri-ureteric abscess is not uncommon in these cases. Ureteral rupture complicated with retroperitoneal abscess and sepsis can result in death.¹²

Spontaneous rupture of the calyceal-fornix renalis with urine extravasation in the perinephric space or the retroperitoneum is an uncommon complication of obstructive nephropathy. It is important to distinguish extravasations of fornical backflow from frank rupture of a diseased renal pelvis or the ureter.⁶ Involvement of fornix renalis is uncommon with the majority of fornix renalis being associated with ureteral obstruction by ureteral stones or stones of the pelvi-ureteric junction.^{1, 5} Less common causes include tumour, pregnancy, enlarged lymph nodes, ruptured renal cysts, post irradiation scars,

retroperitoneal fibrosis and enlarged prostate gland.¹³ Sudden obstruction of the ureter will increase the pressure of the collecting system and the elevated pressure is temporarily relieved with dilatation of the collecting system. As the condition progresses, urine may escape through the collecting system by tearing of the renal fornix.^{3, 12} Harrow and Sloane in 1961 classified fornicial rupture into four categories: pyelosinus, pyelolymphatic, pyelovenous and pyelotubular.¹⁴ Differentiation can be made between true rupture of ureter or renal pelvis and fornicial rupture. The presence of contrast material around the calyx is highly suggestive of fornicial rupture.¹⁵ Non-visualisation of the ureter on the affected side usually indicates rupture of the ureter or renal pelvis.¹⁵ If the radiological image remains unchanged for period of time, it always points to the possibility of the ureteral rupture, while in cases of fornicial rupture, contrast extravasation usually disappears in 24 to 48 hours after the onset of an attack.¹⁵

Clinically, most patients with actual rupture of ureter are more unwell with fever and leukocytosis compared to those with backflow extravasations.¹⁵ The management of obstructive stones with fornix renalis is mainly conservative and recovery is often uneventful. However, peri-renal abscesses can occur as delayed complications in approximately 10%.¹⁶

Our first patient had distal ureteral calculus with extravasation of contrast down the ureter, signifying ureteral rupture. He was managed with ureteroscopy with electrohydraulic lithotripsy and DJ stenting. The second case had radio-opaque shadow at the ureterovesical junction with peri-renal leakage of

contrast into Gerota's fascia which tracked down to the ureter and was associated with grade II calyctasis, signifying fornicial rupture. We failed to insert a DJ stent because of oedema at the site of calculus. Fortunately, he recovered with symptomatic treatment. It is very likely that he had passed the stone spontaneously as, if he had not, he would have presented at our clinic since we are the only referral centre for urological complications.

In conclusion, spontaneous partial rupture of the ureter is rare and in most cases are caused by ureteral stones. Management includes decompression of the urinary system and treatment of the underlying aetiology.

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When we look at breastfeeding support, we tend to see it in two-dimensions: **time** (from pre-pregnancy to weaning) and **place** (the home, community, health care system, etc). But neither has much impact without a THIRD dimension (3D) **Communication!**

Communication is an essential part of protecting, promoting and supporting breastfeeding. We live in a world where individuals and global communities connect across small and great distances at an instant's notice. New lines of communication are being created every day, and we have the ability to use these information channels to broaden our horizons and spread breastfeeding information beyond our immediate time and place to activate important dialogue.

This third dimension includes cross-generation, cross-sector, cross-gender, and cross-culture communication and encourages the sharing of knowledge and experience, thus enabling wider outreach.

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