Case Report

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Spontaneous ureteric rupture due to high pressure chronic retention

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Abstract

Spontaneous ureteric rupture is a rare phenomenon which can be traumatic or non-traumatic that may arise from ureteric obstruction, trauma, mucosal inflammation from urolithiasis, connective tissue disease or retroperitoneal fibrosis. High pressure chronic retention is characterised by noctural enuresis, a tense palpable bladder, hypertension, progressive renal impairment, bilateral hydronephrosis and hydroureter on imaging. Obstructive urological symptoms are typically absent in uncomplicated cases. We report the case of a 69-year-old male who presented with high pressure chronic retention and spontaneous ureteric rupture demonstrated on a noncontrast CT. This patient was managed with a urethral catheter on free drainage and a retrograde ureteric stent. The patient's condition improved, and the stent was removed after a uretero-pyeloscopy which revealed no extravasation. He later underwent a successful transurethral resection of the prostate.

Keywords

Urological surgery, Spontaneous rupture, Ureter, Urinoma

Key message

Spontaneous ureteric rupture is a rare phenomenon. Clinical acuity is important in the diagnosis and management to avoid complications

Case report

A 69-year-old man was admitted to accident and emergency with a 2-day history of lower abdominal discomfort and difficulty passing urine. When questioned about his lower urinary tract symptoms he described poor stream, dysuria and difficulty voiding.

On examination, the patient had an unremarkable cardiorespiratory system. Abdominal examination revealed a tense, distended bladder extending to the umbilicus. Bladder scan revealed a volume over 999ml. DRE revealed a large prostate with no suspicious features.

On admission, blood tests demonstrated a haemoglobin of 95 g/L, a white cell count of 21.5×109/L, CRP of 265, a potassium of 5.0 mmol/L, a creatinine of 699 mmol/L, eGFR of 19 ml/min and an INR of 7.2.

The patient had a background of chronic renal failure (eGFR 28 ml/min); renal stone disease 15 years before, acute on chronic renal failure post coronary artery bypass graft 15 years before, hypertension, left ventricular failure, atrial fibrillation for which he was on warfarin, high cholesterol, myocardial infarction, type II diabetes mellitus and he was an ex-smoker.

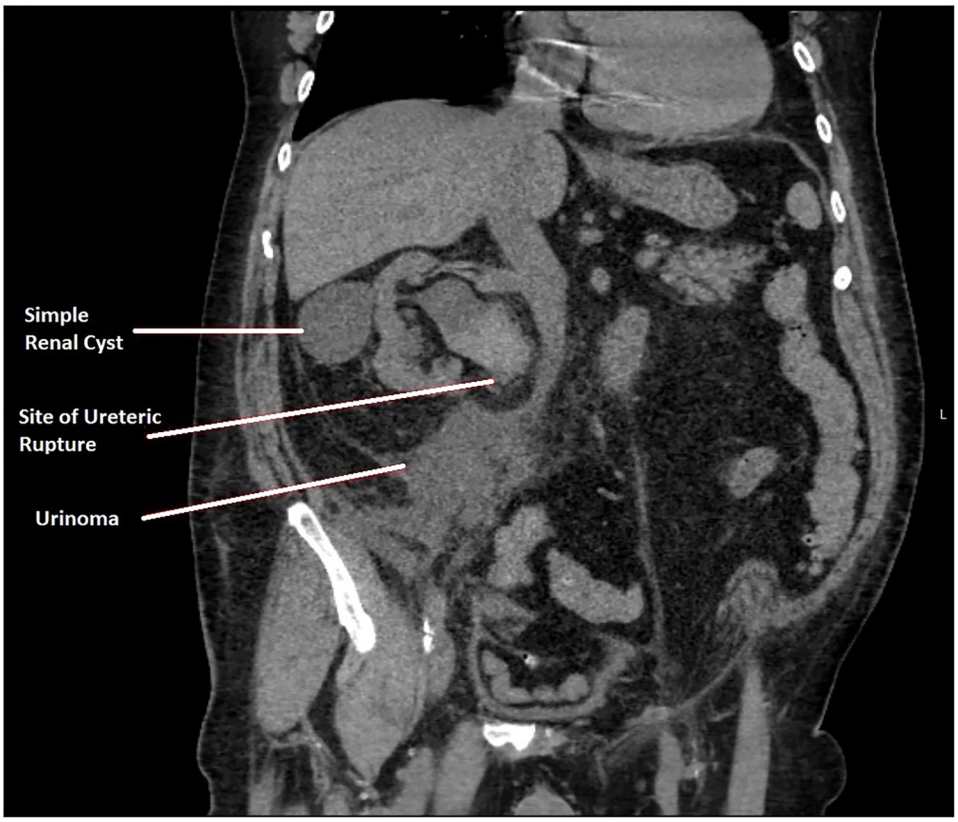
Non contrast CT abdomen and pelvis was performed to assess the collecting systems. Contrast was not administered owing to his high creatinine. The CT demonstrated a dilated right renal pelvis and proximal ureter with extravasation of urine into the retroperitoneum anterior to the psoas together with perinephric fat stranding keeping in with a ureteric perforation (Figure 1 and 2). There was no evidence or urolithiasis and the left urinary tract was unremarkable.

The patient was catheterised with a residual volume of 3000 ml. He received intravenous antibiotics. A rigid cystoscopy, right retrograde pyelogram and insertion of JJ stent were performed (Figure 3 and 4). This identified a large tri-lobar prostate, catheter related changes to the bladder mucosa and normal ureteric orifices. A right retrograde study revealed upper ureteric extravasation without an obvious cause. The upper ureter was not visualised and there was no dilatation of the proximal half of the ureter. Urine cytology revealed atypical cells with papillary group which was suspicious. A 6Fr-28 cm percuflex stent was inserted over a guidewire and the procedure was completed uneventfully.

He had a post-obstructive diuresis with a negative balance for the first 24 h and decompression haematuria. The creatinine improved from 699 mol/L to 286 mol/L after 4 days and his INR normalised.

The patient underwent an interval CT Urogram (Figure 5) six weeks later which showed resolution of hydronephrosis, no extravasation of contrast, no filling defects in the kidney or ureter and a JJ stent in situ.

Figure 1. Coronal section of CT demonstrating the site of ureteric rupture and fluid collection inferiorly with perinephric fat stranding. There is also a simple renal cyst.



Twelve weeks following his initial admission the patient was electively re-admitted for right sided rigid and flexible ureteropyeloscopy (Figure 6), exchange of JJ stent on string and a transurethral resection of prostate. No stones, mass lesions or TCC were identified during the procedure. The patient made a good recovery post operatively and had a successful trial without catheter and stent removal before being discharged.

Discussion

A Medline(R) search with keywords 'Rupture, Spontaneous/ or Spontaneous ureteric rupture.mp.' and 'Urinary Retention/ or high pressure chronic retention.mp.' revealed 60 case reports of different pathology. This is the first reported case of spontaneous ureteric rupture due to high pressure chronic retention.

The first case of spontaneous ureteric rupture was described by Diaz and Buenrostro in 1856.[1] Schwartz et. al. reported a case of ureteric rupture and used the term 'spontaneous' when there was: no external trauma; no cystoscopic or ureteric manipulation; no external compression; an absence of destructive kidney disease; and no history of previous surgery.[2]

Stravodimos et. al. reported five cases of spontaneous ureteric rupture; one patient had an obstructing ureteric stone, but others had no obvious cause.[3] Choi *et al.* reported a case of upper ureteric rupture in a patient with high pressure retention in a neurogenic bladder.[4]

Spontaneous ureteric rupture may present with symptoms including sudden onset abdominal and/or flank pain, nausea and vomiting. The patient may experience ileus due to chemical irritation of the peritoneum lying anteriorly.[5] Examination may reveal abdominal tenderness with ipsilateral costovertebral angle tenderness. The high creatinine levels in blood may arise from absorption of extravasated urine which is also known as reverse dialysis. Important differential diagnoses includes urinary lithiasis, pyelonephritis, appendicitis, cholecystitis and diverticulitis and aortic aneurysm.

Ultrasound is useful to detect fluid collections in the retroperitoneal space but an excretory phase CECT is the choice of investigation to identify collecting system leaks and urinomas which can be identified on delayed phase as their enhancement can range from 0 to 20HU

Figure 2. Axial section of CT demonstrating the site of ureteric rupture and fluid collection inferiorly with perinephric fat stranding.

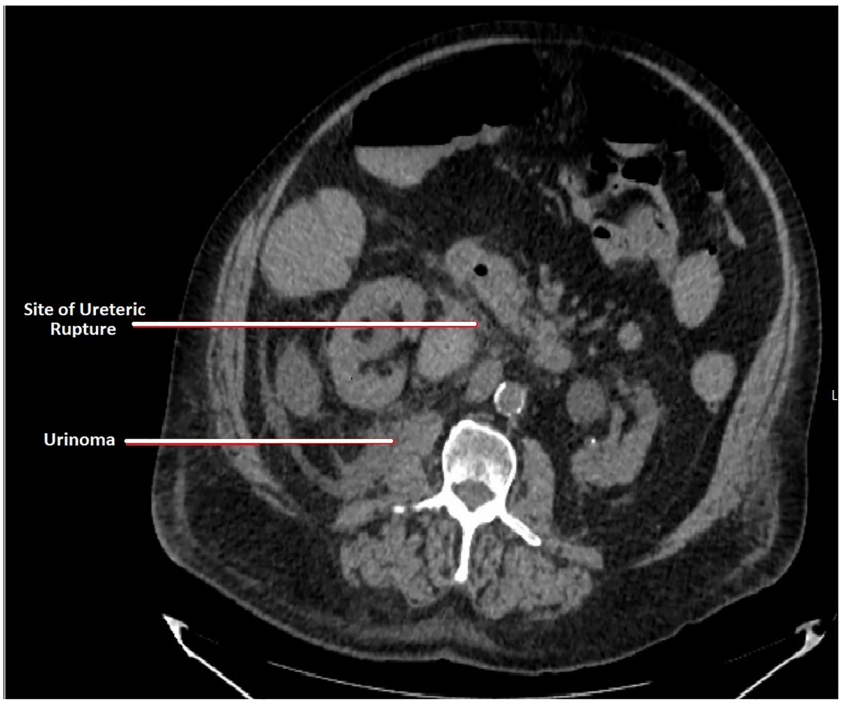


Figure 3. Right retrograde pyelogram shows extravasation of diluted contrast material.

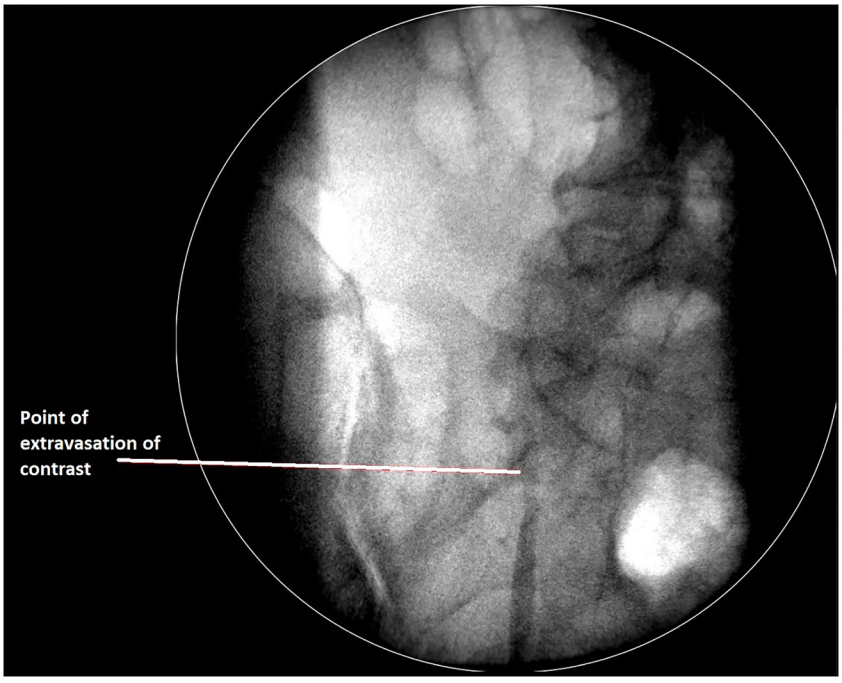


Figure 4. Fluoroscopic images showing successful placement of JJ Stent.

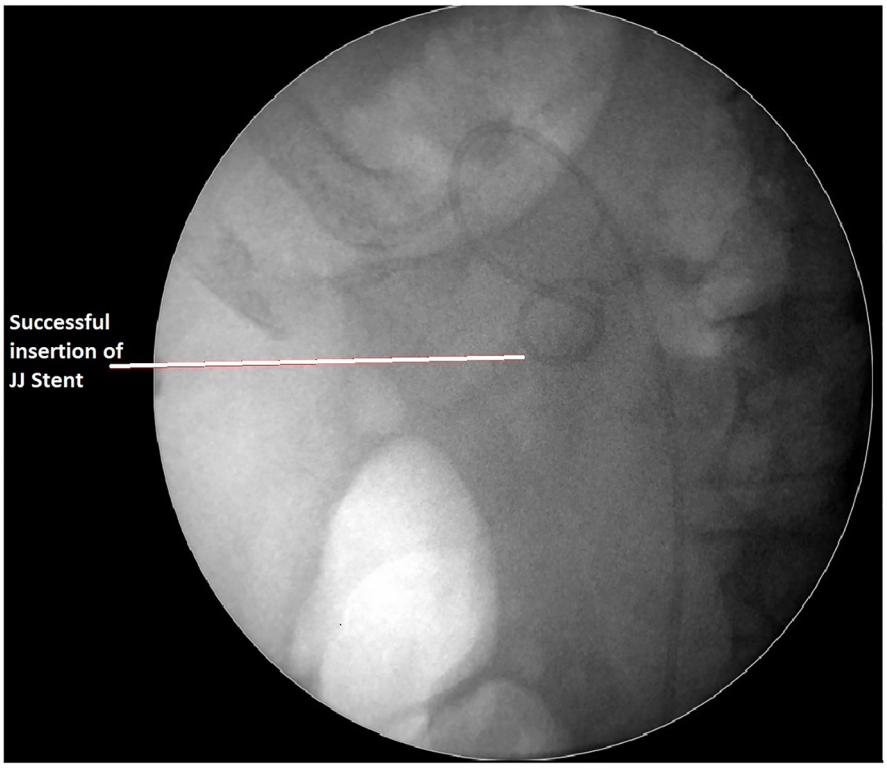


Figure 5. Coronal section of CT with excretory phase demonstrating no extravasation of contrast.

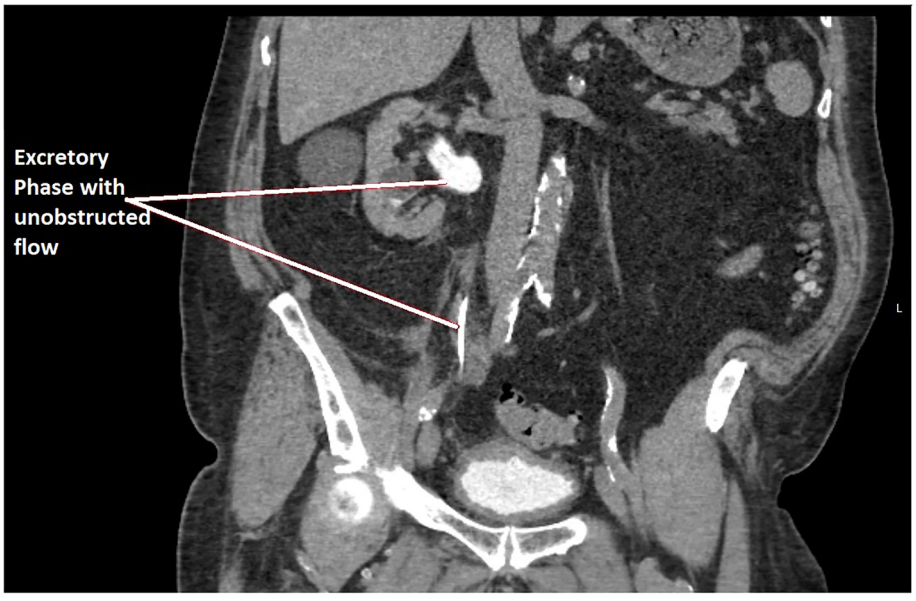
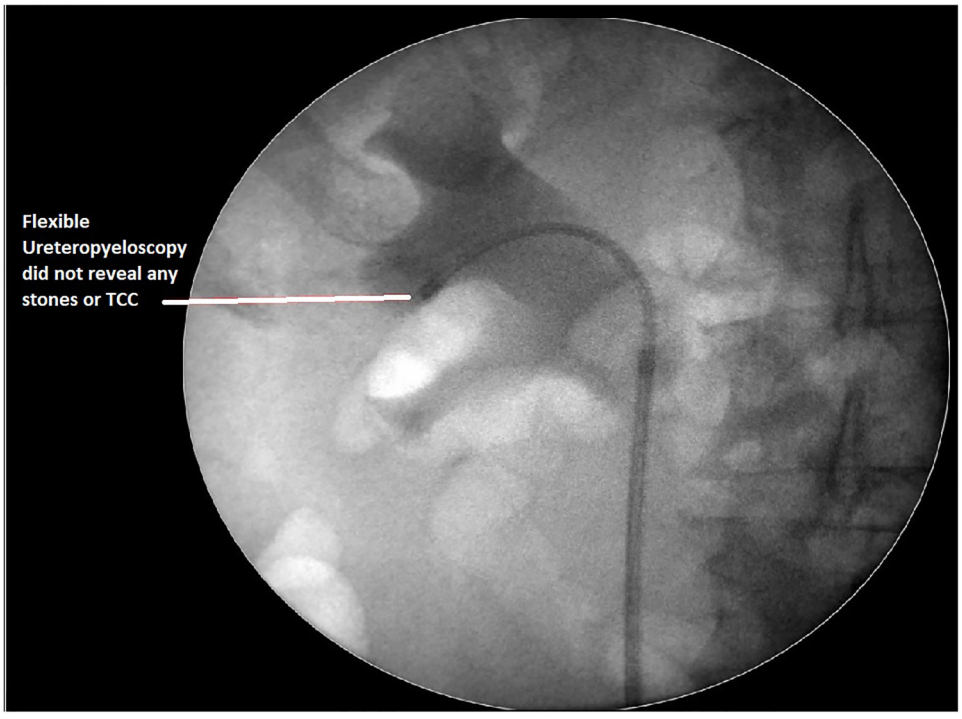


Figure 6. Retrodrage study and flexible ureteroscopy did not reveal contrast extravastion. There were no stones or transitional cell carcinoma in the collecting system.



before intravenous contrast and they enhance up to 200HU after administration.[6,7] Retrograde pyelograms are routinely done intraoperatively to identify the exact location of the rupture.

The fornix is the most common site of rupture followed by the upper ureter when pressure exceeds a critical level reported from 20 to 75 mmHg.[8] However this is a broad range and further manometric data from future case reports would be needed to confirm this.

Management of the spontaneous ureteric rupture is not standardised and varies from conservative management, nephrostomy, ureteric stenting, ureteric reconstruction and nephroureterectomy in severe cases.[9,10] The patient may also require drainage of the urinoma. Treatment should be individualised for the patient and the grade of ureteric rupture. Antibiotic coverage is mandatory for all patients. Patient may develop serious complications including urinoma, perinephric or retroperitoneal abscess and urosepsis. Hence all cases should be treated promptly as late complications such as ureteric stricture, ureteropelvic stenosis, or periureteric fibrosis occur.

Stravodimos *et al.*, who reported the successful treatment of ureteric rupture by insertion of a double-J stent under fluoroscopy, likewise achieved resolution of the perforation and gradual reabsorption of the urinoma.[3] There have been reports of ureteric rupture managed via open surgery, but a large number of these case reports highlight benefits of minimally invasive endourological procedures[8,9]

In our case we successfully managed the rupture with a ureteric stent. A uretero-pyeloscopy was performed owing to the abnormal urine cytology and his chronic retention was managed with a transurethral resection of prostate.

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