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A Case Report Spontaneous Ureteric Rupture Secondary to Ureterolithiasis

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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.

Keywords: Spontaneous, Distal ureteric calculi, Ureteric rupture

INTRODUCTION

Spontaneous rupture of the ureter is a rare urological occurrence with only a small number of cases reported in the literature. It is defined as extravasation of urine from the ureter which occurs without trauma or iatrogenic manipulation of the ureter. It often occurs secondary to ureterolithiasis with urinary tract obstruction and resultant increased intraluminal pressure and subsequent rupture [1]. It may also be secondary to a tear of the ureter during passage of the stone [2]. Published cases have reported pregnancy, ureteral strictures, tumors, bladder outlet obstruction and retroperitoneal fibrosis among the contributing causes. Peritoneal irritation by urine results in presentation with an acute abdomen, sometimes without any urinary tract symptoms or urinalysis abnormalities. Owing to its presentation it is often misdiagnosed as appendicitis or diverticulitis [3]. Majority of reported incidents generally involve the proximal ureter, renal fornix or pelviureteric junction [4]. It may lead to urinoma, infection with sepsis, acute kidney injury and abscess formation if left untreated [1]. 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.

CASE REPORT

A 25 year old previously healthy female, presented at emergency surgical department, CHA with complaining of severe abdominal pain associated with two episodes of vomiting and chills and rigors. She denied any associated dysuria, hematuria or frequency. On examination she was found to be tender in the lower abdomen. She was given analgesia with little effect. A urinalysis revealed microscopic hematuria; whilst blood investigations were within normal limits. A contrast Computed Tomography (CT) of the abdomen was performed and she was found to have free fluid in the left retroperitoneum associated with obstruction of the left kidney and ureter by a 13 mm calculus in left ureter distal to crossing of left iliac vessels **(Figures 1 and 2)**. This confirmed extravasation of contrast medium around the left kidney and ureter. Suggestive of a perforation of the left collecting system. A diagnosis of spontaneous left proximal ureteric perforation secondary to urolithiasis was made. Blood tests, clinical parameters and temperature were still well within normal limits, despite the severity of symptoms and clinical examination. We opted to treat her with percutaneous nephrostomy tube insertion. A 16 F urethral catheter was inserted to avoid reflux. The patient was also started on intravenous antibiotic piperacillin/

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tazobactam. Two days later she was still complaining of severe pain, and had increasing tenderness in the left flank and abdomen so exploratory laparotomy was planned **(Figure 3)**.

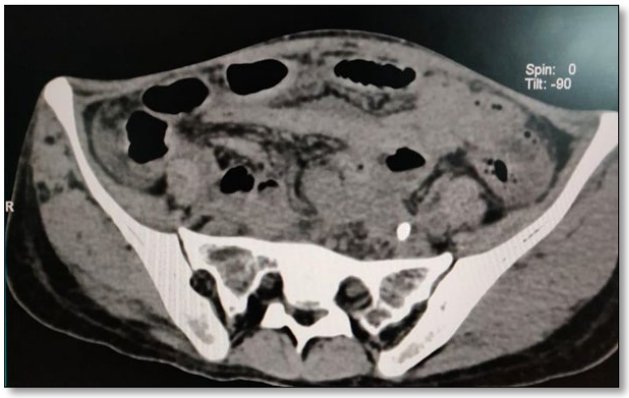

Figure 1. A non-contrast CT KUB was performed which showed a 13 mm stone in pelvic part of the left ureter.

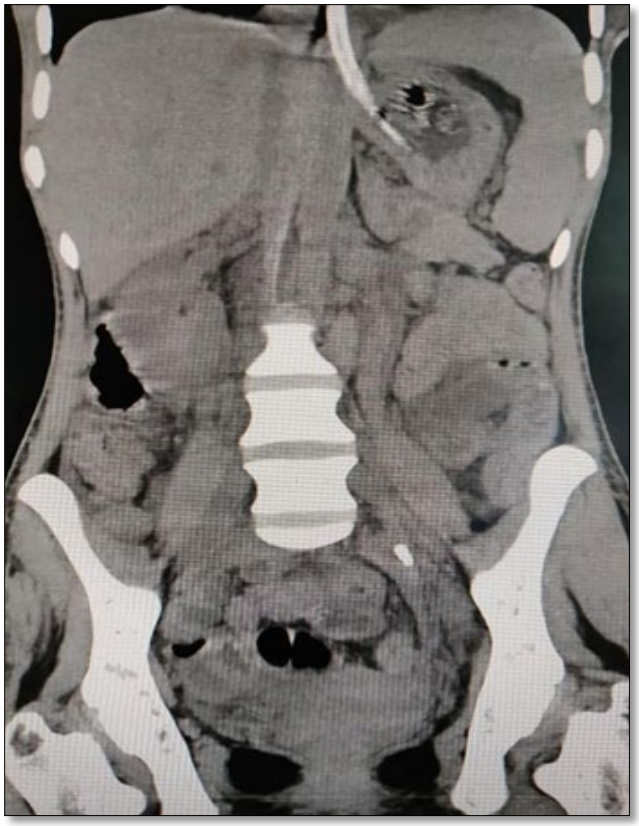

Figure 2. Coronal view reconstructions using maximum intensity projection, showing proximal ureteric leak of contrast.

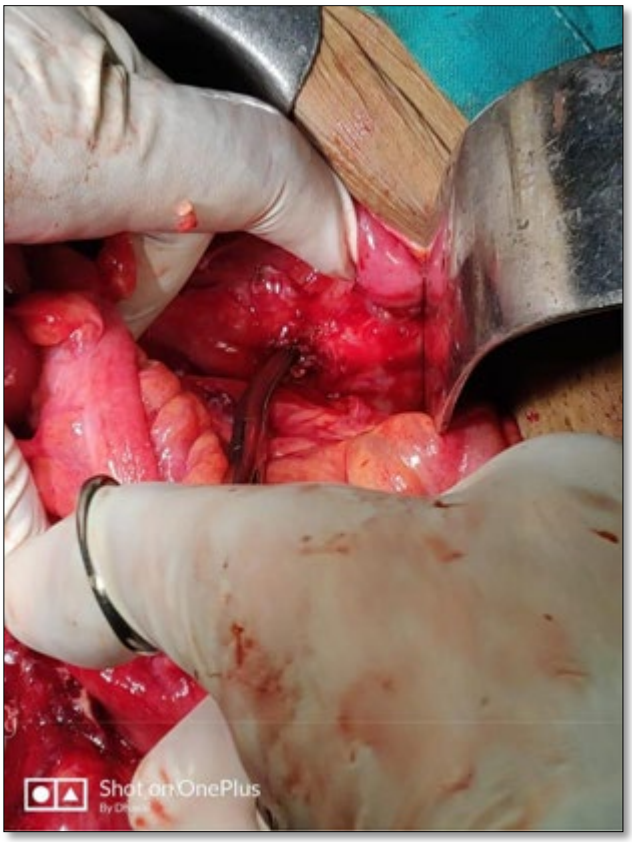

Figure 3. Intraoperative perforation site of left ureter.

DISCUSSION

Spontaneous ureteral rupture is a surprisingly rare condition. It is by definition non-traumatic in origin, and can be difficult to diagnose unless a high index of suspicion for this condition is maintained. The most common cause for spontaneous ureteral rupture is obstructing ureteral calculi. Other reported rarer causes include tumor, retroperitoneal fibrosis, pregnancy, connective tissue disorder and acute urinary retention. The condition should be suspected in cases of ureteric colic which develop significant acute worsening of symptoms, with increased areas of tenderness, with or without a reactive peritonitis. Imaging is required to confirm the diagnosis. Whilst ultrasound can be helpful in identifying a perinephric or retroperitoneal fluid collection, the condition is best diagnosed with a delayed CT scan post-intravenous contrast. This modality will confirm a urinary leak and can accurately define the site of rupture. Coronal reconstructions may further help in accurately identifying the site of leak. The use of a delayed film post IV contrast is also very useful in differentiating a ureteral rupture from an infective perinephric abscess that can also arise from obstructing calculi. It can also differentiate from forniceal rupture. Due to the rarity of this clinical condition, there are no guidelines or recommendation on its' management. We managed our patient with insertion of a double-J ureteral stent which was then removed after 12 weeks. On reviewing

case reports of patients with this condition, the majority were also managed with a double-J ureteral stent. Conservative management was adopted in a smaller amount of patients. Percutaneous drainage with or without nephrostomy/ante grade stent is another reported option [5,6]. Development of fever or hemodynamic changes may indicate an infective process of the resulting urinoma and antimicrobial therapy ± drainage needs to be considered. A high serum creatinine may also be noted from reabsorption of the urinoma. On stent removal, we performed an on table retrograde pyelogram to confirm there is no residual leakage and also to exclude significant stricturing. A CT IVU after stent removal may also be considered as an alternative to this approach.

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. 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 urine.

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 [7]. 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. In general, prompt intervention will reduce both mortality and morbidity. Nevertheless, the general principles of controlling sepsis take precedence prior to definitive surgery.

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