CASE REPORT

Spontaneous ureteral rupture

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Summary
Spontaneous ureteral rupture is defined as the nontraumatic leakage of urine from the ureter. This is a rare urological disorder, and only a small number of cases have been reported. Here, we report a rare case of a patient with spontaneous ureteral rupture who presented at our emergency department with abdominal distension and flank pain; the final diagnosis was confirmed through computed tomography (CT). The patient received urgent right percutaneous nephrostomy, double-J stenting, and treatment with broad-spectrum antibiotics, which resulted in a favorable outcome. Although uncommon, emergency physicians must have knowledge regarding this condition, which often presents as an acute abdominal condition and may be misdiagnosed as another condition requiring surgical intervention. Abdominal ultrasonography and CT should be included in the treatment of all cases suspected with this condition in order to reduce unnecessary surgical intervention.

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1. Introduction

Spontaneous ureteral rupture is defined as the nontraumatic leakage of urine from the ureter. It is a rare condition and a potential urological emergency. Here, we present the rare case of a patient diagnosed with spontaneous ureteral rupture leading to urinoma. Although uncommon, emergency physicians must have knowledge regarding this condition, which often presents as an acute abdominal condition and may be misdiagnosed as acute appendicitis or diverticulitis.

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2. Case Report

A 65-year-old man with a history of iron-deficiency anemia was referred to our emergency department with a 2-day history of abdominal distension and flank pain. On arrival, his vital signs were stable, and his body temperature was 36.6°C. Physical examination revealed costovertebral angle knocking pain on either side, and whole abdominal distension without muscle guarding and rebound tenderness. Laboratory studies revealed no abnormalities except microscopic hematuria. Abdominal radiography showed retention of fecal material in the colon. On the basis of persistent abdominal and flank pain, we suspected ascending colonic or cecal diverticulitis and/or appendicitis; therefore, an emergency abdominal computed tomography (CT) was performed. Abdominal CT revealed luminal stenosis and an obstructive lesion in the right upper ureter complicated by right obstructive uropathy and mild hydronephrosis. The leakage of urine from the right renal pelvis and ureteropelvic junction had led to the formation of urinoma within the right perirenal and pararenal space of the retroperitoneum (Figure 1). The patient initially received an urgent right percutaneous nephrostomy and treatment with broad-spectrum antibiotics. On the 2nd day, radiolucent ureteral stones were removed through ureterorenoscopic manipulation and double-J stenting. After 5 days, the patient’s condition considerably improved, and bedside ultrasonography revealed the disappearance of the perirenal and pararenal fluid collection. The patient was discharged 6 days after admission.

3. Discussion

Spontaneous ureteral rupture is a rare condition, and urinary calculi represent the most frequent cause of such ureteral and pelvic ruptures. Other causes of collecting system obstruction that may lead to rupture are congenital abnormalities, abdominal and pelvic masses, retroperitoneal fibrosis, iatrogenic and postirradiation strictures, a transplanted kidney, and connective tissue disorders. Two underlying mechanisms have been proposed. First, the impact of urinary stones may cause the erosion of the ureteral wall, which subsequently and directly leads to ureteral rupture. Alternatively, ureteral trauma and ulceration may be caused by the downward movement of the calculus, which then obstructs the distal ureter; this leads to an increase in the intraureteric pressure, subsequently causing ureteral rupture at the weakest point. Other causes of spontaneous ureteral rupture include obstruction, tuberculosis, ureter cancer, high-dose steroid therapy, infection, and inflammatory reactions.

Spontaneous ureteral rupture typically presents as a sudden onset of severe abdominal and flank pain that is often associated with nausea, vomiting, dysuria, urinary frequency, and hematuria. Urinalysis usually reveals pyuria and hematuria. Urine extravasation may occur close to the peritoneum, which then causes peritoneal irritation. On physical examination, patients may have abdominal tenderness and pain with costovertebral angle tenderness on the ipsilateral side. In some cases, diagnosis can be difficult because of nonspecific symptoms. Differential diagnoses include urinary lithiasis, appendicitis, cholecystitis, diverticulitis, and various other possible causes of abdominal pain. Ureteral rupture often presents with gastrointestinal symptoms close to the peritoneum and can result in chemical peritoneal irritation that mimics diverticulitis and appendix.

The differentiation of spontaneous ureteral rupture from forniceal rupture, a more common and relatively benign condition, is crucial. Forniceal rupture is considered
a pathological condition engendered by a microscopic tear in the caliceal fornix because of an increase in the intrapelvic pressure. Similar to spontaneous ureteral rupture, a calculus is the most common etiological factor. The presence of a contrast medium around the calyx is highly suggestive of fornical rupture, whereas nonvisualization of the ureter on the affected side is usually indicative of a ureteral rupture.

The misdiagnosis of ureteral rupture as acute appendicitis or diverticulitis is not uncommon. Trapnell reviewed eight cases of spontaneous ureteral rupture, and of these, one-half were initially diagnosed with acute abdominal conditions such as acute appendicitis. Diamond and Marshall reviewed 34 patients with spontaneous urinary extravasation, and nine of these patients were treated through exploratory laparotomy for acute abdominal conditions.

Previously, an intravenous pyelogram was the gold standard for diagnosing ureteral rupture. However, with advances in technology, ultrasonography and CT have become widely-used tools. Ultrasonography is a real-time, inexpensive, repeatable, and radiation-free diagnostic tool. It is easily accessible and time saving when used in the emergency department. In cases of ureteral rupture, ultrasonography is a beneficial method of detection because it detects the presence of a small fluid amount collected in the perirenal, pararenal, and retroperitoneal spaces, and the presence of hydronephrosis, in addition to excluding other abdominal pathologies.

The average age of reported patients with ureteral rupture is 42 years, with no predominance of either sex. In one study, there were nine men and nine women with a median age of 59 years (range, 22–82 years). Of these, the causes of rupture in 56% and 17% patients were ureteral stone and ureteral stricture, respectively. Of the remaining patients, one had a ureteral tumor and the remaining 22% had no obvious cause. Thirteen of the 18 patients (72.2%) were treated through primary ureteroscopy and double-J stenting.

Ureteral stones are the most common causes of spontaneous ureteral rupture. Most patients received ureteroscopy and double-J stenting. Conservative management with antibiotics can also have a favorable outcome. Most patients experience a sudden onset of abdominal or flank pain. Spontaneous ureteral rupture should be considered as a possible differential diagnosis when a patient presents with flank pain at an emergency department.

In conclusion, although uncommon, spontaneous ureteral rupture often presents as an acute abdominal condition and can be misdiagnosed as acute appendicitis or diverticulitis. Abdominal CT should be performed in patients suspected with this condition in order to avoid unnecessary surgical intervention.

References