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Case report

Spontaneous calyceal rupture caused by a ureteral calculus

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Abstract
Rupture of the urinary collecting system with perirenal and retroperitoneal extravasation of the urine is an unusual condition that is typically caused by ureteral-obstructing calculi. We report a case of calyceal rupture with urinoma formation, due to a stone in the distal ureter. The diagnosis was confirmed by computed tomography. Diagnosis, follow-up, and therapeutic approach are discussed.

Introduction

Spontaneous rupture of the urinary collecting system with urine extravasation in the perirenal space or in the retroperitoneum is an uncommon complication of obstructive uropathy [1]. It is usually associated with ureteral obstruction by calculi. Other rare causes include ureteric obstruction secondary to posterior urethral valves, prostatic hyperplasia, trauma, and pelvic neoplasms [2]. Less commonly, it may be related with pregnancy, abdominal aorta aneurysm, and retroperitoneal fibrosis [3].

We report herein a case of spontaneous calyceal rupture due to a calculus in the lower ureter.

Case report

A 61-year-old woman presented in the hospital with a 2-week history of left lumbar pain associated with nausea and vomiting. There was no history of trauma or previous similar attack. Physical examination revealed significant tenderness on the left flank and inguinal region. Abdomen was not distended and bowel sounds were normal. She had no leukocytosis, and kidney function tests were normal. Urine analysis showed erythrocyte, seldom leukocyte.

A plain abdominal radiograph showed no abnormality. Because no obvious diagnosis was made, patient continued vomiting and her pain increased, an abdominal computed tomography (CT) scan was performed.

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Fig. 1 Contrast-enhanced CT image showing moderate dilatation of the left calyceal system and fluid collection in the perirenal space.

Fig. 2 Multiplanar reconstruction of enhanced CT scan showed the leakage of contrast medium from left kidney.

Plain CT images revealed malrotated ectopic left kidney in the lumbar area, with moderate hydronephrosis accompanied by a fluid collection in the perirenal space. After contrast material injection, delayed phase images showed extravasation of the contrast into the perirenal space considered an urinoma from rupture of the upper calyceal group. There was also dilatation of the left ureter until 2 cm before the uretero-vesical junction (Figs. 1 and 2). The stone was not seen and the right kidney was normal.

Ureteroscopy was performed to reveal the cause of dilatation and a 4 mm × 2 mm calculus was detected in distal ureter. Her calculus was extracted by dormia basket, a double-J catheter was inserted and antibiotics were prescribed. Under the conservative treatment, the patient's symptoms ceased, and ultrasonography does not show perirenal collection after two weeks. Two months later, her catheter was removed, without any complication.

Discussion

In this case, patient presented with left lumbar pain associated with gastrointestinal symptoms. A CT scan revealed malrotated ectopic left kidney with rupture of the upper calyceal group. It failed to show the cause of the ureteral obstruction in the pelvis. Ureteroscopy revealed a little calculus in distal ureter. The patient successfully underwent endoscopic treatment.

The clinical manifestation of spontaneous urinary extravasation is diverse, ranging from mild flank discomfort to unremitting abdominal pain such as acute abdomen. Gastrointestinal symptoms like nausea and vomiting may be pronounced and may create problems in diagnosis. Sometimes, it is associated with fever or hematuria. The features are often indistinguishable with simple ureteral stone, as were seen in our patient [3,4].

Plain abdominal radiographs are often non-contributing [5]. Ultrasonography may detect the obstructive site, fluid extravasations or hydronephrosis [6]. Intravenous urography is a very sensitive and specific method to confirm the diagnosis of calyceal rupture. However, it is accused of provoking, or at least of increasing, extravasation due to the diuretic effect of the contrast media and is proposed to be eliminated from the first line diagnostic options, as well as in the acute phase of renal colic [7]. In fact, we opted for CT scanning, as in our case, because of the expected poor resolution of an intravenous urography in an unprepared patient. Also, it can make the differential diagnosis of acute abdomen [4], obtain more accurate information about the location and the size of the urinoma on CT, and the progression of its characteristics can be readily assessed as well [8].

According to the majority of the related literature, the management of obstructive stones with calyceal rupture is conservative and antibiotics are used to prevent infection. Recovery is most often uneventful. As the first therapeutic step, a low pressure system should be established [9]. The treatment depends upon the cause of urinary extravasation. Stenting of the ureter is a treatment method for calyceal rupture with upper ureteral and ureteropelvic junction stones. Distal and middle obstructive stones associated with renal rupture also, as in this case, may be treated by ureteroscopic lithotripsy combined with ureteral stenting [10].

Conclusion

Spontaneous calyceal rupture should always be considered in the differential diagnosis of a patient presenting with complex symptoms after renal colic. Symptoms will regress with conservative management. Diagnosis is suspected on ultrasonography, and confirmed by computed tomography. With a low pressure system and antibiotic treatment, the outcome is excellent. Endourologic treatment offers excellent results.

Conflict of interest

None declared.

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