

Rare complication of ureteral double-J stenting after ureteroscopy: pelvic ectopic renal parenchymal perforation

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Abstract

Scarce data are available on pelvic ectopic renal parenchymal perforation. However, this complication might lead to serious consequences. Clinicians should pay attention to the early identification and treatment of this complication. We herein report the first case of pelvic ectopic renal parenchymal perforation caused by a double-J stent after ureteroscopy. Compared with previously reported cases of renal parenchymal perforation not involving an ectopic kidney, our case involved no renal capsule hematoma and no other serious complications. Our primary management strategy was to review relevant examinations and tests, perform close monitoring, and instruct the patient to stay in bed. The patient recovered smoothly after the ureteral stent was removed 1 month postoperatively.

Keywords

Double-J stenting, ureteroscopy, ectopic kidney, perforation, early diagnosis, case report

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Introduction

The incidence of an ectopic kidney is about 0.1%, and the incidence of a pelvic ectopic kidney is about 0.05%.^{1,2} A pelvic ectopic kidney with ureteral calculi is even rarer. Ureteroscopy is a common treatment method for ureteral calculi. In 1967, Zimskind et al.³ reported the first case of

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double-J stenting via the endoscopic route. Ureteral stent implantation thereafter became a commonly used procedure after ureteroscopic laser lithotripsy. In urologic practice, clinicians encounter many adverse events such as hematuria, urinary tract infections, urethral irritation, and flank pain secondary to vesicoureteral reflux.⁴ Additionally, very rarely seen complications include ureteroarterial fistula, intravascular migration of a double-J catheter, and knotted stents.⁵⁻⁸ Moreover, renal parenchyma perforation might cause a subcapsular hematoma, severe hemorrhage, and even hemorrhagic shock. Pelvic ectopic renal parenchymal perforation caused by double-J stent insertion is an even rarer complication. We herein report a case of this rare complication after ureteroscopy to provide urologists with a reference for treatment. To the best of our knowledge, this is the first report of pelvic ectopic renal parenchymal perforation caused by double-J stent insertion after ureteroscopy with holmium:YAG laser lithotripsy.

Case report

A 56-year-old man was admitted to our hospital because of a >5-hour history of

right lower abdominal pain. After completing the relevant examinations, we diagnosed the patient with a right ureteral calculus and a right pelvic ectopic kidney. The vivid images obtained by spiral three-dimensional computed tomography (CT) reconstruction of the urological system (Figure 1) accurately showed the anatomy of the pelvic ectopic kidney. Bacterial growth was not detected in a urine culture. The ureter of the ectopic kidney was tortuous. Because the stone was close to the bladder, we used rigid ureteroscopy to treat the stone. After thorough preoperative preparation, we used ureteroscopy with holmium:YAG laser lithotripsy to treat the right ureteral calculus under general anesthesia. The stone was broken and removed smoothly during the operation. We estimated the ureteral length, and a guide wire was then inserted into the renal collecting system under ureteroscopic guidance. A 4.7-Fr, 28-cm double-J stent was inserted into the collecting system using the guide wire. Part of the ureteral stent was placed in the bladder according to the ureteral length. The patient had mild low back pain on the right side and mild hematuria after the operation. There was no significant difference in the hemoglobin level before and after the



Figure 1. Three-dimensional computed tomography reconstruction of the urological system accurately showing the anatomy of the ectopic kidney.

operation. Abdominal CT was performed to gain more information about postoperative treatment and the position of the ureteral stent (Figure 2). The result suggested that the proximal ureteral stent was located in the bladder, but the distal ureteral stent was located outside the renal contour. The patient remained on strict bed rest for 5 days, during which time we closely observed his vital signs and urine output. His symptoms of right low back pain and hematuria were significantly improved. Before discharge, we instructed the patient to return to the hospital 1 month later to remove the ureteral stent. The patient was discharged successfully. One month later, he returned to the hospital as scheduled to remove the ureteral stent. Before removing the ureteral stent, a plain film of the abdomen (kidney, ureter, and bladder film) (Figure 3) was obtained to determine the condition of the ureteral stent. We then removed the right ureteral stent under cystoscopy. After the operation, we closely observed whether the patient had any symptoms of discomfort.

He developed no obvious symptoms of discomfort and returned home 1 day after the ureteral stent was removed.

Discussion

The probable symptoms and common complications following double-J stent insertion



Figure 3. Plain film of the abdomen (kidney, ureter, and bladder film) before removal of the ureteral stent.

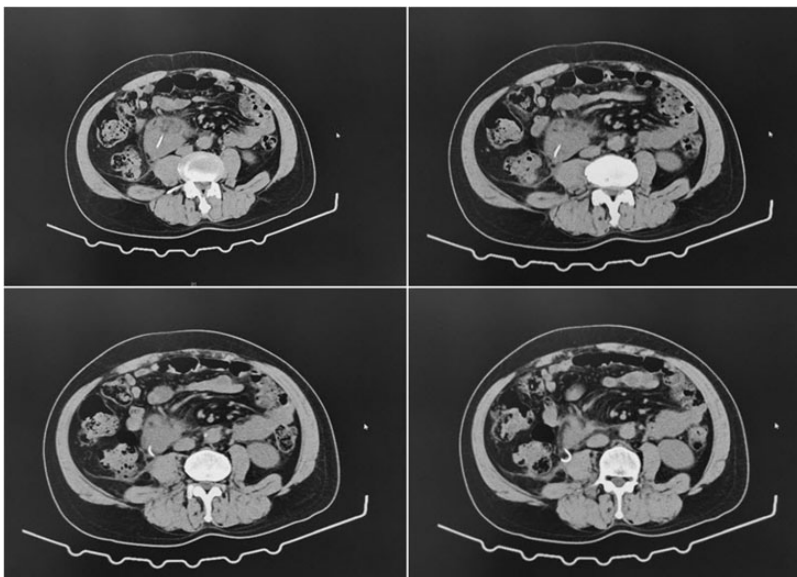


Figure 2. Abdominal computed tomography after the operation.

include lower urinary tract symptoms, hematuria, loin pain, urinary tract infection, stent malpositioning, vesicoureteral reflux, luminal obstruction, stone formation, ureteral erosion or necrosis, and stent fracture, encrustation, or migration distally or proximally within the urinary system.^{9,10} Sarier et al.¹¹ evaluated 107 live-donor kidney transplant patients and reported that colonization of ureteral stents was common in these patients. Other reports have described rarer and more serious complications.^{12,13}

Dündar et al.¹⁴ first presented a case of renal parenchymal perforation due to double-J stent insertion. The double-J stent insertion caused a renal parenchymal hematoma in that case. The hemoglobin level decreased to 7 g/dL and the daily urinary output was 200 mL after surgery. On the second postoperative day, CT showed that the tip of the stent had perforated the renal parenchyma, bent at the subcapsular area, and caused a hematoma (8 × 3 cm) posterior to the left kidney, pushing forward anteriorly. On the third postoperative day, the double-J stent was repositioned in the renal pelvis under Xuoroscopy. On the ninth postoperative day, the patient was discharged with a creatinine level of 1.3 mg/dL. Nomikos et al.¹⁵ described a 62-year-old woman who underwent stent insertion because of hydronephrosis of her solitary functioning left kidney and subsequently developed renal perforation and a retroperitoneal hematoma. On the fifth postoperative day, the patient was managed conservatively with blood transfusion and double-J stent repositioning in the collecting system. Abdominal noncontrast CT at the first and third months after stent placement showed stabilization of the hematoma. Altay et al.⁴ also presented a case of a 35-year-old woman who developed perforation of the renal parenchyma but without a perirenal hematoma following insertion of a double-J ureteral stent after flexible

ureteroscopy for the treatment of an upper ureteral calculus. On the second day postoperatively, the patient was successfully managed with repositioning of the stent under fluoroscopic guidance.⁴

In the present case, the ureteral tortuosity of the pelvic ectopic kidney increased the difficulty of the operation. The probability of complications following double-J stent insertion was thus increased. The causes of such complications are diverse. Although the stent length is often determined based on the patient's height, some studies have suggested that radiographic assessment of the distance between the ureteropelvic and ureterovesicular junction is a more appropriate indicator and that stent lengths chosen in this way are associated with a lower frequency of perirenal hematoma and distal migration.¹⁶ The abnormal anatomy of an ectopic kidney is also a cause of these complications. There are few reports of patients with ectopic kidney stones. Therefore, surgeons' lack of experience is another cause of such complications. In addition, the material of the guide wire can contribute to the development of complications. A soft guide wire has a lower probability of complications than a hard guide wire. Therefore, experienced doctors, a soft guide wire, familiarity with the anatomy of the ectopic kidney, and predicting the stent length in advance will help to reduce the incidence of such complications. Scarce data are available on pelvic ectopic renal parenchymal perforation. Compared with previously reported cases of renal parenchymal perforation that did not involve an ectopic kidney, our patient developed no renal capsule hematoma and no other serious complications. Our primary management strategy was to review relevant examinations and tests, perform close monitoring, and instruct the patient to stay in bed. The patient recovered smoothly after the ureteral stent was removed 1 month after the operation. We have

herein reported the first case of pelvic ectopic renal parenchymal perforation caused by a double-J stent after ureteroscopy. Nevertheless, data were lacking and some points needed to be clarified. In future, more data and cases should be accumulated to provide a reference for urologists in the clinical setting.

Conclusions

There are scarce data on pelvic ectopic renal parenchymal perforation. However, this complication might lead to serious consequences. Clinicians should pay attention to the early identification and treatment of this complication. We have herein reported the first case of pelvic ectopic renal parenchymal perforation caused by a double-J stent after ureteroscopy to provide urologists with a reference for treatment. Additional data and cases should be accumulated to strengthen this reference.

Consent to participate and ethics approval

The patient provided written informed consent for the use of his imaging data and publication of this case. Approval by an ethics committee or institutional review board was not applicable because we performed no research or trials on patients; we only reported a case and its relevant data, and the patient agreed to our use of his data.

Declaration of conflicting interest


The authors declare that there is no conflict of interest.


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