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ENDOUROLOGY

Case Report

An unusual complication of a double-J ureteral stent: Renal parenchymal perforation in a solitary kidney

Double J üreteral stentin nadir bir komplikasyonu: Soliter böbrekte renal parankimal perforasyon

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ABSTRACT

Double-J ureteral stenting is commonly used in urological practice and has various complications. We report a patient with a renal parenchymal perforation and perirenal hematoma due to a double-J ureteral stent in a solitary kidney. This complication of ureteral stents is rarely observed and is life-threatening.

Key words: Complication; kidney; rupture; stent.

ÖZET

Üreteral double j stent uygulaması ürolojide çeşitli komplikasyonlarla yaygın şekilde kullanılmaktadır. Bu çalışmada soliter böbrekte double j stentine bağlı böbrek perforasyonu ve perirenal hematom gelişen bir vaka sunulmuştur. Bu komplikasyon üreteral stentlerin nadir görülen ve hayatı tehdit eden bir komplikasyonudur.

Anahtar kelimeler: Komplikasyon; böbrek; rüptür; stent

Introduction

Ureteral stents are widely used in urology clinics to protect urinary flow. The complications of ureteral stent implantation are observed more frequently with the increased use of these stents. Early complications of double-J (DJ) ureteral stents are stent discomfort, irritative bladder symptoms and hematuria.[1] In contrast, migration, encrustation, and fragmentation are the most frequent complications in the late period.[1] Renal parenchymal perforation with a DJ ureteral stent has been reported twice in the literature.[2,3]

We report a patient with a renal parenchymal perforation and perirenal hematoma caused by a DJ ureteral stent in a solitary kidney. This complication of ureteral stents is rare and life-threatening.

Case presentation

We report a 66-year-old man who presented to our urology clinic with vomiting, left flank pain and hematuria. There was a secondary obstruction of the left ureteropelvic junction due to a prior pyeloplasty operation, and he presented to our clinic one week after a diagnostic ureterorenoscopy and DJ stenting at another medical center. His medical history revealed a right nephrectomy due to nephrolithiasis. Kidney ureter bladder (KUB) radiography revealed a DJ stent between the bladder and left kidney (Figure 1). His serum urea, creatinine and hemoglobin levels were normal on presentation, but his creatinine increased to 1.88 mg/dL before the stent reposition. Computerized tomography (CT) revealed a renal parenchymal perforation caused by the DJ stent, posterior perirenal extravasation and a reactive pleural effusion on the same side (Figure 2, 3). The patient was underwent reposition of the DJ stent in the pelvis renalis under fluoroscopic examination, and there was no extravasation by retrograde pyelography. His flank pain, hematuria and pleural effusion resolved on the first postoperative day. His serum creatinine decreased to 1.01 mg/dL, and the patient was discharged on the second postoperative day. We obtained written informed consent from the patient to publish this case report.

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Figure 1. KUB image of a double-J ureteral stent after renal parenchymal perforation
KUB: kidney ureter bladder

Discussion

Ureteral stents are commonly used in urological practice for supravesical urinary obstruction.[4] Although ureteral stents cause bothersome symptoms, such as postoperative flank pain and bladder pain, these stents are widely used after ureteroscopy to maintain urinary flow.[5] Additionally, unplanned hospital visits are more frequent in patients without a ureteral stent.[6] Further, ureteral stricture formation may be observed less frequently with stenting after ureteroscopy.[7] Ureteral edema and transient ureteral obstruction has been observed after balloon dilatation in animal studies, and ureteral stents might be required after ureteral dilation.[8] A ureteral DJ stent had been placed in our patient after ureteroscopy, but there was no information about the indication for the stent.

Although ureteral stenting is a common and safe procedure in urology practice, life-threatening complications, including hemoperitoneum, renal vein perforation and ureteroarterial fistula, have been reported.[9-11] Fluoroscopy is not a standard radiological imaging method in the urology operation room, but fluoroscopic examination could be used to manipulate the stent position to detect complications such as renal or ureteral perforations. Closed tip stent insertion could be a risk factor for these complications, and the Seldinger method appears to be safer. However, we could not find any study that compares the Seldinger method and closed tip stent insertion.

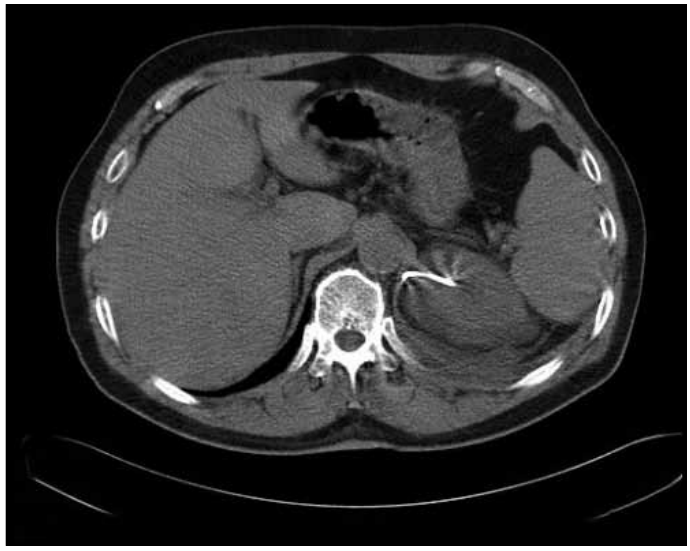

Figure 2. Renal parenchymal perforation on the medial side and perirenal hematoma on the posterior kidney with the proximal end of a double-J stent on non-contrast CT imaging
CT: computed tomography

Figure 3. Contrast CT imaging: Renal parenchymal perforation with a double-J stent, posterior perirenal extravasation and a reactive pleural effusion on the same side
CT: computed tomography

According to our literature search, Dundar et al.[2] was the first to report a renal parenchymal perforation with a DJ stent in a patient with a solitary kidney. A DJ stent placed after a ureterorenoscopy had been performed for 4 stones in the left kidney and 1 stone in the left distal ureter in a 50-year-old man.

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On the first postoperative day, atrial fibrillation with a rapid ventricular response and anuria were observed. The DJ stent was found to be out of the collecting system, and a CT scan showed a perforation of the renal parenchyma and a subcapsular hematoma. The patient was managed by repositioning the stent under fluoroscopy, blood transfusion and hemodialysis. The heparin infusion used during dialysis was a risk factor for the large hematoma (8 x 3 cm) in this case. Later, Nomikos et al.[3] reported a 62-year-old female patient with a solitary functioning kidney admitted to the emergency room with left-sided renal colic. A 4.8 Fr DJ stent had been placed for 2 ureteral stones, and left-sided abdominal tenderness and gross hematuria were observed the next day. While the patient was being treated with bed rest and blood transfusion, a CT scan showed a 12 x 8 cm perirenal hematoma and the tip of the DJ stent penetrating the parenchyma without any contrast extravasation. This patient was also managed by repositioning the stent under fluoroscopic guidance with no further complications.

Our patient is the third presented in the literature with a renal parenchymal perforation and hematoma after DJ stenting in a solitary kidney. We think that renal parenchymal perforation in a solitary kidney might be a reason for compensatory hypertrophy and histopathological changes in the contralateral kidney. Our patient had undergone diagnostic ureterorenoscopy at another medical center. Although the renal function of our patient was normal, a DJ stent was inserted into a solitary kidney. There was no information about the method used for stent insertion. We repositioned the DJ stent under fluoroscopic guidance, and the hematoma was treated with conservative methods.

In conclusion, the insertion of a DJ stent should be performed carefully due to serious complications. This case and other serious complications should be kept in mind by urologists who insert DJ stents. The insertion of a DJ stent through a guide-wire under fluoroscopy might be a good method for these patients. The best method for inserting DJ stents should be determined by analyzing a large complication case series due to the risk of ureteral or renal perforation.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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