



Double J stent migration as renal penetration

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ABSTRACT

Transurethral double J (DJ) stent placement is a standard method for drainage during ureteral obstruction caused by a ureteral stone and for the management of complications after transurethral ureterolithotripsy (TUL). This is a safe and minimally invasive technique; however, severe cases of DJ stent migration have been reported, although rarely. Herein, we report the CASE of a 48-year-old man with DJ stent migration as renal penetration, which arose as a complication after an unsuccessful TUL. As transurethral DJ stent placement is one of the basic techniques performed by urologists, possible rare complications of the placement should be taken into consideration.

Introduction

Transurethral double J (DJ) stent placement (TU-DJSP) is a standard method for drainage during ureteral obstruction caused by a ureteral stone or for the management of complications after transurethral ureterolithotripsy (TUL).¹ TU-DJSP is considered a safe and minimally invasive technique; therefore, it is widely used in urological clinical practice. However, severe cases of DJ stent migration have been reported, although rarely. Herein, we report the CASE of a 48-year-old man with DJ stent migration as renal penetration, which arose as a complication after an unsuccessful TUL.

Case presentation

A 48-year-old man was referred to our department because he was suffering from strong right abdominal pain. He had been diagnosed with a right ureteral stone (diameter: 5–6 mm) with slight hydronephrosis and inflammation around the kidney on computed tomography (CT; Fig. 1A). He underwent first TUL under general anesthesia 1 week later; however, the surgery was unsuccessful. A rigid ureteroscope could not reach the stone, and the ureteral access sheath for a flexible ureteroscope could not be inserted into the ureter due to ureteral orifice stenosis (Fig. 1B). Two hydrophilic guidewires, ENDO ACCESS® Guide Wire (BD), were placed for safety and for the dilation of the ureteral orifice. They passed beside the stone smoothly and turned into the renal pelvis

during dilation. Because dilation was ineffective, we decided not to continue the surgery. A retrograde pyelogram was not performed during the surgery. TU-DJSP was performed using X-ray illumination, and a DJ stent, Inlay Optima® Ureteral Stent (BD), was placed. Coiling of the distal and proximal loops of the stent was not excellent; however, we expected an improvement in coiling over the natural clinical course as the distal loop sufficiently protruded from the ureteral orifice (Fig. 1C). There was slight hematuria at the end of the surgery. Hematuria without coagulation worsened after a few hours of surgery, which spontaneously improved through the next morning. Full coiling of the proximal loop of the DJ stent was confirmed on abdominal plain radiography (Fig. 1D). On the second day after surgery, he had fever for one night, with no right abdominal pain or back pain. He was discharged 5 days after surgery. He visited our outpatient clinic on the 16th day after surgery. He presented with only slight hematuria; however, migration of the DJ stent was confirmed using abdominal X-ray that showed that the proximal loop of the stent was positioned far from the stone in the renal pelvis and the lower half of the stent was significantly bent, although not shown. To plan succeeding treatment appropriately, we performed a CT scan, and the migration of the DJ stent as renal penetration was confirmed (Fig. 2). Eight days after this visit, he underwent second TUL under general anesthesia, which was successful. The DJ stent was easily removed, and the ureteral stone was completely extracted. During the surgery, there was no renal bleeding, and the renal penetration hole was not clearly observed endoscopically. A new DJ stent was correctly placed (Fig. 3).

Abbreviations: CT, computed tomography; DJ, double J; TU-DJSP, transurethral double J stent placement; TUL, transurethral ureterolithotripsy.

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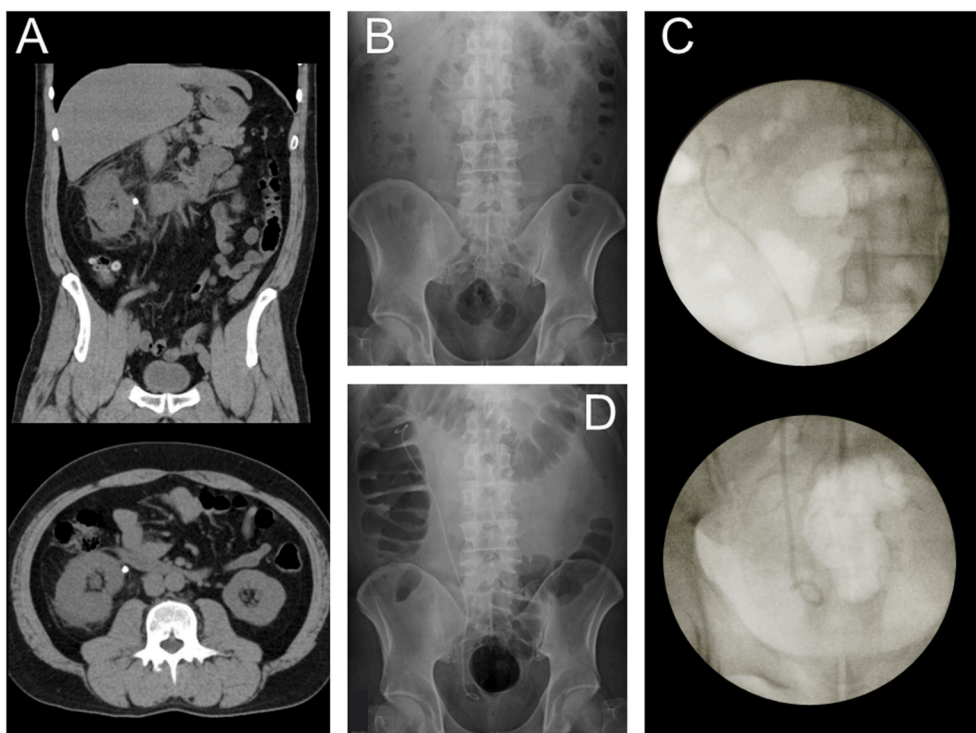


Fig. 1. Abdominal computed tomography (CT) scan, abdominal plain radiography scan, and X-ray illumination.

(A) An abdominal CT scan at presentation. Coronal view and axial view. Right ureteral stone (diameter: 5–6 mm) with slight hydronephrosis and inflammation around the kidney was affirmed. (B) An abdominal plain radiography scan before the first transurethral ureterolithotripsy (TUL). The right ureteral stone was stable. (C) X-ray illumination at the end of the first TUL. A double J stent, Inlay Optima®R?R Ureteral Stent (BD), was placed, but both the loops of the stent had inadequate coiling. (D) An abdominal plain radiography scan on the next day following TUL. Full coiling of the proximal loop of the DJ stent and maintenance of the distal loop at the ureteral orifice position were affirmed.

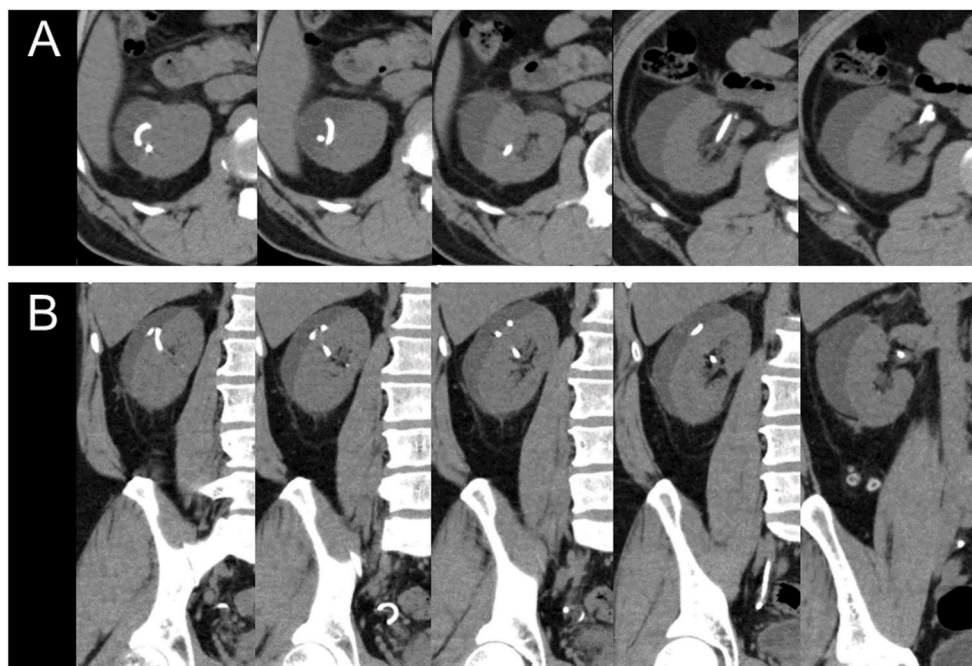


Fig. 2. An abdominal computed tomography (CT) scan on the 16th day after the first transurethral ureterolithotripsy.

(A) Axial views of the right kidney. (B) Coronal views of the right kidney and right ureter. Renal penetration of the DJ stent with subcapsular hematoma and stent migration into the ureter were affirmed. The stent directly penetrated the renal parenchyma. The stone position was affirmed adjacent to the stent.

His postoperative course was unremarkable, and he was discharged 4 days after the second TUL.

Discussion

The incidence of ureteral stent migration has been reported to be less than 5%.¹ Sometimes, urologists experience migration of the DJ stent into the proximal ureter as a result of an improperly performed TU-DJSP

and perforation of the DJ stent into the retroperitoneal space with a guidewire, especially in the presence of an incarcerated ureteral stone in stenosis. However, ureteral stent migration, as in this report, rarely results in serious complications in patients, and severe cases of ureteral stent migration have seldom been reported.^{2,3} For example, damage to the duodenum and rectum have been reported due to ureteral stent migration in some CASE reports.^{2,3}

The present CASE is the first report on ureteral stent migration as

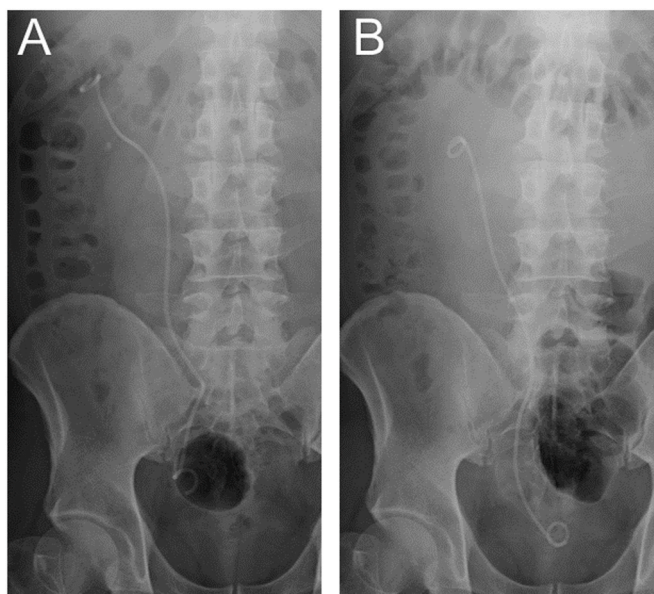


Fig. 3. An abdominal plain radiography scan. (A) Pre and (B) post second transurethral ureterolithotripsy.

(A) Migration of the DJ stent and renal stone from the ureter were affirmed. (B) A new DJ stent was properly placed, and the stone disappeared.

renal penetration after TU-DJSP. Retrospectively, we thought that the tip of the proximal loop of the DJ stent placed under the renal pelvic mucosa or submucosa during the first surgery inched into the renal parenchyma toward the subrenal capsule, like a corkscrew, due to its restoring force within a few hours after the surgery. Fortunately, the condition of the patient in the present study did not worsen throughout the clinical course.

Inadequate coiling of the proximal loop and the shortness of the DJ stent relative to the patient's physique were reported as risk factors for ureteral stent migration into the proximal ureter; however, definitive factors have not been identified.^{1,4,5} In the present CASE, inadequate coiling of the proximal loop of the DJ stent is the most significant factor. In addition, renal pelvic mucosa might have been injured by the guidewire used in the first TUL. Further, it is considered that the DJ stent

was improperly repositioned under X-ray illumination at the end of the first TUL. Our clinical experiences regarding spontaneous improvement of inadequate coiling of the proximal loop of the placed DJ stent might have misled our decision at the time.

Conclusion

TU-DJSP is one of the basic techniques used by urologists; therefore, possible rare complications of the placement should be taken into consideration.

Consent

Written informed consent was obtained from the patient for publication of this CASE report.

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Declaration of competing interest

None.

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