



Two cases of retained ureteral stents presenting with breakage and encrustations

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ABSTRACT

Ureteral stents (Double J stents) have become an integral part of today's urologic practice. But complications like stent migration, encrustation, stone formation and fragmentation have been found when these stents are kept for prolonged period. So, it is mandatory that these stents should be removed as early as possible to prevent complications and morbidity. We report two patients with broken retained DJ stents with encrustations and calcification.

Key words: DJ Stents, retained, broken, encrustations.

INTRODUCTION

Double J (DJ) Stenting was first described in 1967 by Zimskind et al; since then, it has been widely used in urological practice [1, 2] for managing ureteral obstruction due to intrinsic or extrinsic causes (stones, tumours, and fibrosis) and for providing adequate internal drainage after ureteral surgery or iatrogenic injuries [3]. However, ureteric stenting is not without complications [1]. These stent related complications are primarily mechanical-stent migration, encrustation, stone formation and fragmentation [1]. The stent acts as a foreign body causing urinary tract infection and pyonephrosis which may also lead to renal non-function [1]. Hence, it is mandatory that ureteral stent should be removed as early as possible after it has served its purpose to prevent complication and morbidity [1]. We report two patients with broken retained DJ stents with encrustations and calcification.

Case Summary:

Case 1:

A 26 year old female was admitted with complaints of left flank pain of 5 months duration, which was intermittent and relieved on medication. She was a known case of left renal calculus with left percutaneous nephrolithotomy (PCNL) with DJ stenting done 15 months back at a private hospital. She had history of passing part of the DJ stent in urine 3 months back. She had no history of fever with chills, hematuria, lithuria or pyuria. She had no comorbid illness.

At admission, her vitals were stable. Her abdomen was soft and non tender. The urinary bladder was non-palpable. Complete blood haemogram, renal function tests, liver function tests and serum electrolytes were normal. X-ray KUB (Figure 1) and CT Scan (Figure 2) showed broken DJ stent in situ on left side with upper end of DJ stent in situ. There was encrustation present around the DJ stent.



Figure 1: X-ray KUB of first patient showing broken DJ stent in situ on left side with upper end of DJ stent in situ with encrustations

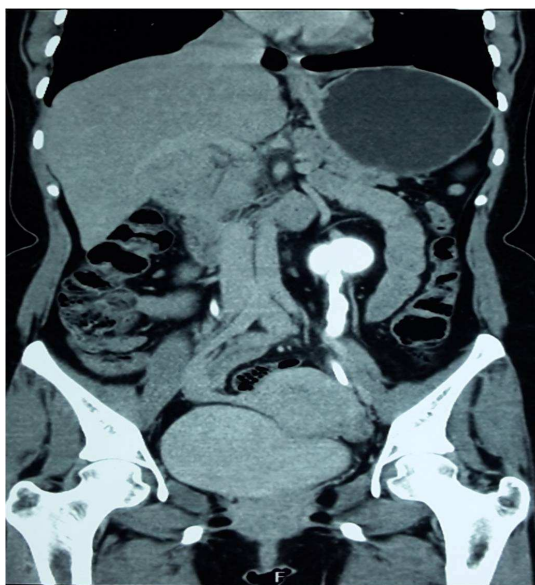


Figure 2: CT KUB of first patient showing broken DJ stent in situ on left side with upper end of DJ stent in situ with encrustations

Abdominal Ultrasound showed normal right kidney. There was a 5.3x1.7 cm staghorn calculus extending from upper pole calyces to dilated extra-renal pelvis in the left kidney associated with moderate hydronephrosis and thinning of parenchyma. Left PCNL was done with removal previous DJ stent and replaced with a new DJ stent. This new DJ stent was removed after 2 weeks.

Case 2:

A 50 year-old male patient was admitted with complaints of left flank pain associated with vomiting and fever. There was no history of hematuria, lithuria, pyuria or any comorbid illness. He was a known case of bilateral ureteric calculi with history of right ureterolithotomy done in 2000 and Left URS + B/L RGP + B/L DJ stenting done in 2002. The patient lost to follow-up after that and presented 13 years later at a private hospital with deranged Renal Function (with serum creatinine of 7.9mg/dl) when left Percutaneous Nephrostomy was done. He now presented to us with stable vitals and left PCN in situ. His abdomen was soft and non-tender. Complete blood haemogram, renal function tests, liver function tests and serum electrolytes were normal.

X-Ray KUB showed left broken DJ stent in the upper ureter with encrustation and right DJ stent with encrustations around it entirely with the stent and encrustations seen in bladder (Figure 3).

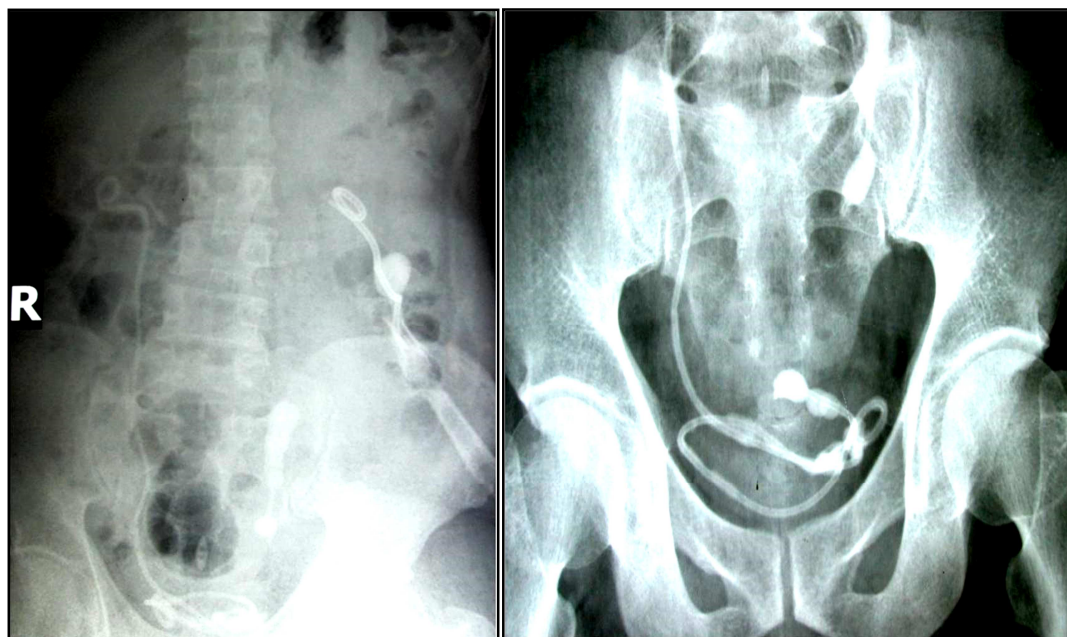


Figure 3 (a and b): X-Ray KUB of the second patient showing left broken DJ stent in the upper ureter with encrustation and right DJ stent with encrustations around it entirely with the stent and encrustations seen in bladder

Ultrasound showed small right kidney with coarse echotexture and a 10 mm cyst at mid-pole and a 19 mm cyst at upper pole. The left kidney was enlarged with moderate hydronephrosis and an 18 mm calculus at lower pole calyx. A 12 mm calculus was seen at left lower ureter. The urinary bladder was partially distended with stent seen in situ.

CT KUB (Figure 4) suggested left renal lower pole calculi and broken Left DJ stent with stone formation and encrustation around with hydronephrosis and hydroureter. Right renal calculi with DJ stent noted in situ with encrustation and calcification along the DJ stent.

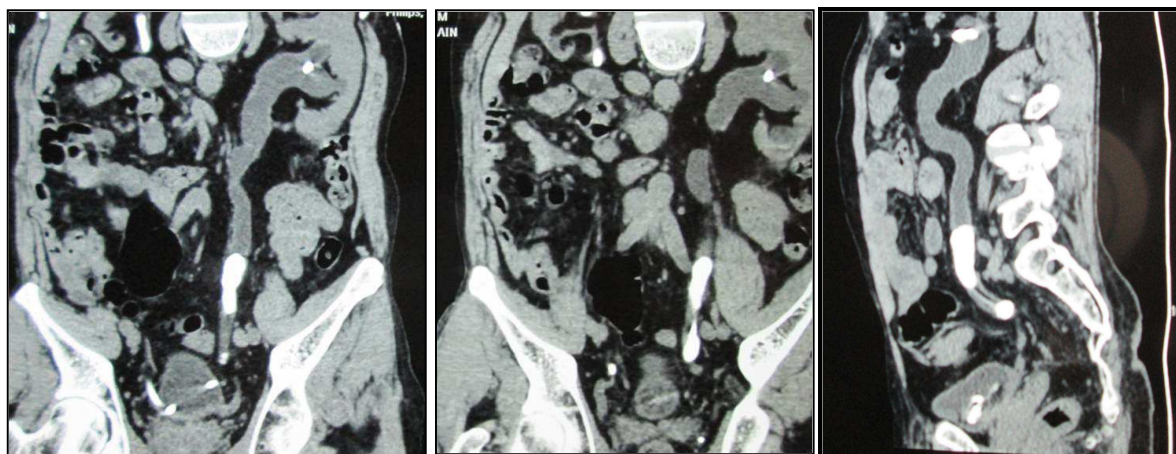


Figure 4 (a and b): left renal lower pole calculi and broken Left DJ stent with stone formation and encrustation around with hydronephrosis and hydroureter. Right renal calculi with DJ stent noted in situ with encrustation and calcification along the DJ stent

On the right side, cystolithotripsy with attempted right ureteroscopic DJ removal was done. The calculus along the DJ stent in bladder was blasted with lithoclast. The DJ stent could not be removed. On the left side, ureterolithotomy

with cystoscopic removal of the left broken DJ stent was done. Right PCNL with removal of the right retained DJ stent was done 2 weeks later.

DISCUSSION

Double J (DJ) ureteric stenting is commonly used in urology for healing of ureter, drainage of urine and prevention of narrowing during healing [1]. These stents are kept for short term period of usually 4 to 6 weeks, which is associated with short lived mild complications [1]. These common stent related complications have been described as “stent syndrome”- Flank pain, frequency, urgency, suprapubic discomfort, hematuria or incontinence [1, 4]. Long term complications are more severe [1]. The stent acts as a foreign body which irritates the ureteral and bladder wall [1]. Extra length impinges on the trigone causing irritative voiding symptoms, hematuria or suprapubic pain [1]. Ureteral peristalsis against the stent leads to flank pain or ureteric colic [1, 4]. Long-term complications are associated with prolonged indwelling times, especially of more than 6 months duration [1]. Stent migration, encrustation, calcification, fragmentation and breakage are the known long-term complications of prolonged DJ stenting.

Selection of proper type and size of the stent is important to reduce complications [1]. Alpha1-blockers have been used with good results for treating these symptoms [1].

Breakage occurs in those who had DJ stent for long duration ranging from 15 to 156 months [1]. The make and design of the stents is an important factor [1]. However, the exact reason of fragmentation is unclear [1]. Stents usually fracture spontaneously after being in situ for a long time, due to hardening and loss of tensile strength [3, 5]. It is sometimes associated with encrustation in forgotten stents [3].

Encrustation of forgotten stents is a serious problem, especially when a large stone burden has developed [3]. The main causes are poor patient compliance with instructions to return for stent removal and inadequate counsel by practitioners [3]. The exact mechanism of encrustation appears to be dependent on several factors like infection and hydrolysis of urea by urease produced by bacteria producing ammonia which causes elevated urinary pH and favors the precipitation of magnesium and calcium as struvite and hydroxyapatite onto the stent surface [3]. Duration of placement of the stents is yet another factor. The indwelling time between 2 and 4 months has been reported to be safe in various studies [3]. Prolonged indwelling stents are known to cause encrustations which result in the formation of calculus at both the ends in bladder as well as kidney [6]. Patients who require indwelling stents beyond this period should be kept on prophylactic antibiotics and have their stents frequently changed [3].

Stent material also contributes to encrustation, with silicone stents being more resistant to encrustation, followed by polyurethane, silitek, percutflex and hydrogel coated polyurethane [3, 7]. Other factors include urinary composition (hypercalciuria, hyperoxaluria, hypocitraturia, homocystinuria, and hyperuricosuria), history of urolithiasis and congenital urinary tract anomalies and malignancies [3].

Management of such complicated stents requires coordinated use of medical, lithotripsy and endourological techniques or open surgery [1]. Endoscopic procedures are usually associated with a high success rate [1]. However, it is advised that cystoscopic removal of these stents should be done gently to avoid ureteric intussusception and stent [6]. The procedure should be carried out under fluoroscopic guidance [6]. Ureteroscopy (URS) and Percutaneous Nephrolithotomy (PCNL) are sometimes required for fragmentation of encrustation, especially when the encrustations are along the entire length of the stent [6]. Open or laparoscopic procedure is only required in cases of failure of endoscopic procedures [1]. Nephrectomy is usually reserved for cases with non-functioning kidney [1].

Extracorporeal shock wave lithotripsy (ESWL) is indicated for localised, low-volume encrustations in kidneys which have reasonably good function [6].

Flexible ureteroscopy with Holmium:YAG (Ho:YAG) laser is advantageous in fragmentation of the encrustations in the renal end of the ureteral stent, thereby avoiding a PCNL [6]. In those cases with less dilated ureters where ureter access sheath (UAS) cannot be passed, another DJ stent should be passed by the side of the encrusted stent and flexible ureteroscopy can be performed as a staged procedure [6].

The best treatment is prevention of this complication [1]. It is always advisable to use DJ stent judiciously and to remove or replace at earliest [1]. In a developing country like India, the patients and their relatives should be adequately counseled about the presence of a foreign body which should be removed after a specified interval at the hospital [6]. Maintaining a stent registry with address and one or more contact number of such patients by all urologists would be extremely helpful in a situation when the patient with a stent in situ doesn't turn up at the specified time for stent removal [6].

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