

Missed Double-J Ureteric Stent Presenting as a Large Stone Burden: A Case Report

GURU THANGIAH ARUN¹, FAAZ SALAH GOMHA², SHEIK AKBAR HUSSEIN³, NASSER JASSIM AL MASLAMANI⁴

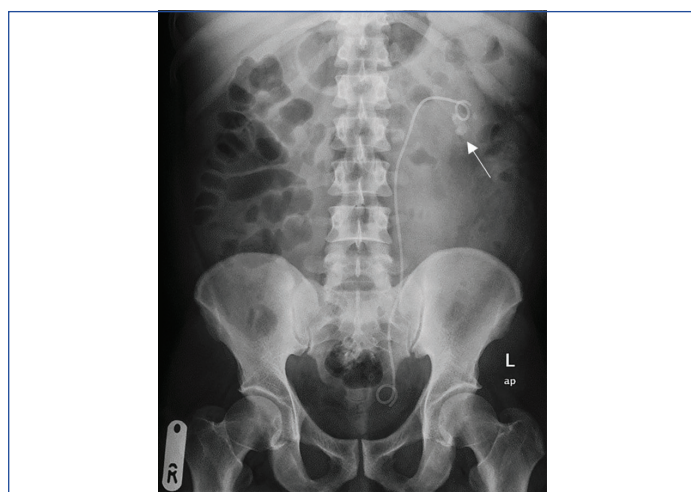
ABSTRACT

Ureteric stenting using a Double-J Stent (DJS) is one of the commonly used urological management techniques to ensure adequate drainage from the renal pelvis to the bladder. However, DJS placements are known to be associated with various consequences and complications. Hereby, the authors present a case of a 46-year-old male who presented to the Emergency Department with left flank pain and haematuria that had persisted for one week. The patient had previously undergone ureteric stenting one year prior for the management of a left ureteric calculus. Unfortunately, he had not returned for follow-up due to the Coronavirus Disease 2019 (COVID-19) pandemic. X-ray of the Kidney, Ureter, and Bladder (KUB) and Computed Tomography (CT) of the KUB revealed a missed left ureteral stent that was completely encrusted and associated with the highest stone burden. This stent was causing obstruction of the left renal pelvis-calyceal system and thinning of the left renal parenchyma. The patient also had a co-existing staghorn calculus and urinary tract infection. After completing a course of antibiotics, the encrusted ureteral stent was surgically removed using cystolitholapaxy with pneumatic lithotripsy, ureteral lithoclast, and percutaneous nephrolithotomy. A new DJS was placed to maintain drainage through the ureter. The patient had no complications during the follow-up period. Authors reported a case of a missed DJS with the highest stone burden within a year to highlight the importance of patient and family education. Authors recommended implementing electronic follow-up systems for patients who undergo ureteric stenting to prevent lost to follow-up, minimise long-term complications, and ensure patient safety.

Keywords: Lithotripsy, Patient education, Percutaneous nephrolithotomy, Postoperative complication, Stent, Urolithiasis

CASE REPORT

A 46-year-old male presented to the Emergency Department with complaints of left flank pain and dysuria that had persisted for one week. Patient had self-medicated for pain but did not experience any improvement. He developed increased frequency of urination and haematuria. In his past surgical history, it was revealed that he had undergone ureteroscopy and left Double-J (DJ) stenting one year ago for a left ureteric stone. Additionally, non-obstructing calculi were found in the left renal lower pole calyx [Table/Fig-1], for which Extracorporeal Shock Wave Lithotripsy (ESWL) was planned. However, due to the COVID-19 pandemic, the patient did not follow up with the Urology Department.

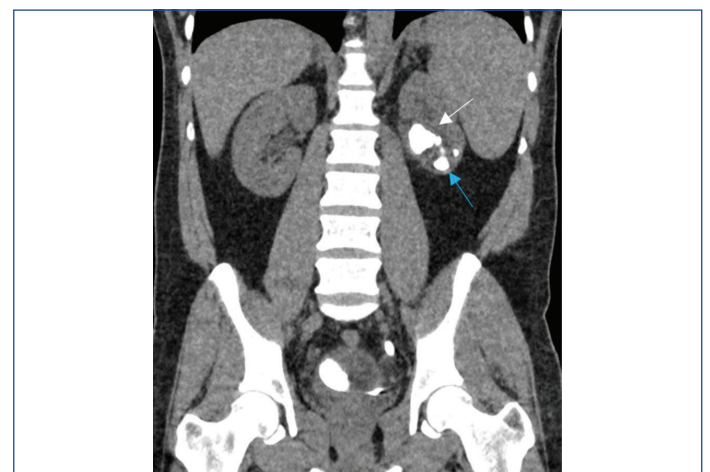


[Table/Fig-1]: Plain Skiagram of Kidney, Ureter & Bladder (KUB) shows appropriately positioned Double J stent (DJS) on left-side with two radiopaque calculi in left kidney. (white arrow).

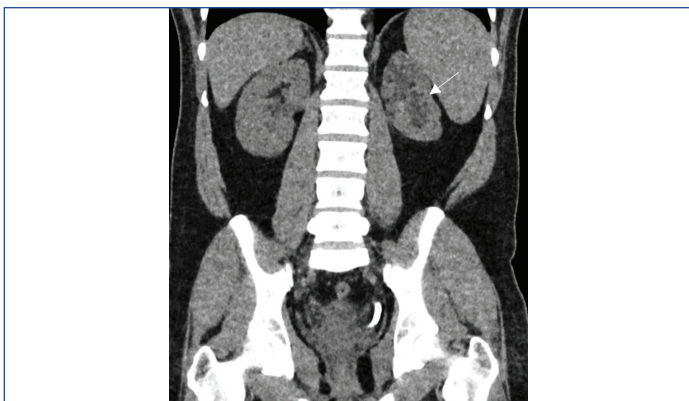
Upon admission, the patient's vital signs were normal and patient did not have a fever. Mild tenderness was observed in the left flank during physical examination. The rest of patient systems showed

no abnormalities upon clinical examination. Patient's abdomen was soft and bowel sounds were present. No organomegaly was detected. Initial complete blood cell count and blood chemistry lab tests revealed leukocytosis (18,000 per cu.mm). Urinalysis showed leukocytosis, and urine microscopy indicated the presence of haematuria and enterococci. However, renal function parameters were within normal range.

An initial assessment with CT KUB [Table/Fig-2] revealed a staghorn calculus measuring 2.6×2.7 cm in the left renal pelvis, as well as another calculus measuring 2.4×1.0 cm in the left renal lower pole calyx. A small calculus with a diameter of 5-6 mm was also observed in the left renal lower pole. The CT scan showed dilatation of the left renal pelvis and calyceal system with multifocal parenchymal thinning (residual parenchymal thickness of 1 mm in the lower pole) [Table/Fig-3]. The normally positioned DJ stent in the left ureter exhibited diffuse encrustation from the upper end to the lower end

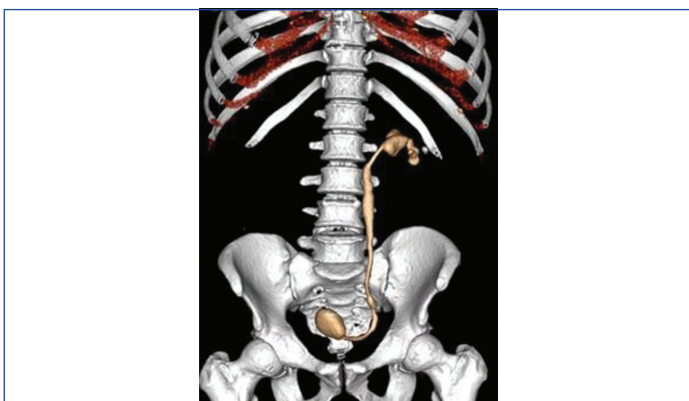


[Table/Fig-2]: Coronal Computed Tomography (CT) image without intravenous contrast shows radiodense staghorn (white arrow) calculus in left kidney. The left renal lower pole shows parenchymal thinning (blue arrow) and multiple calculi.



[Table/Fig-3]: Coronal Computed Tomography (CT) image without intravenous contrast shows mild dilatation of left renal calyces (white arrow).

in the bladder, except for a short length in the proximal part [Table/Fig-4]. The total stone burden in the left ureter along the DJ stent was approximately 150 mm, with the calculus around the upper end of the DJ stent measuring 27 mm and the vesical calculus along the lower end of the DJ stent measuring 33 mm [Table/Fig-5]. Based on these findings, author diagnosed the patient with a missed stent with complete encrustation causing gross hydronephrosis on the left side, along with a co-existing staghorn calculus in the left renal pelvis and left renal lower pole.



[Table/Fig-4]: Virtual Reconstruction (VR) of CT image shows diffuse encrustation of the DJ Stent (DJS) on left-side appearing as stony stent.



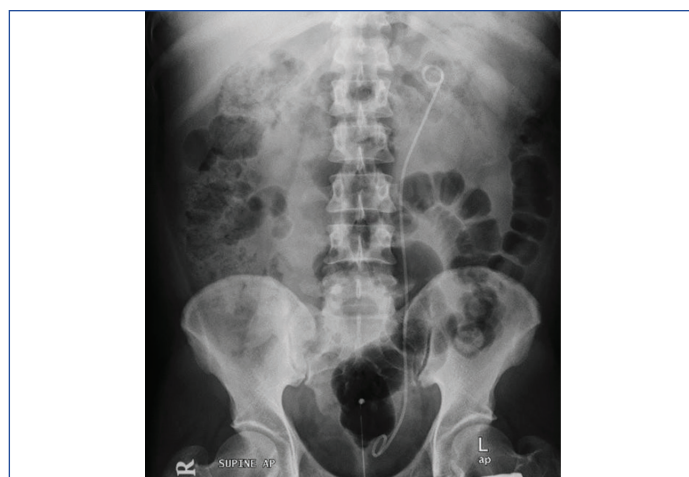
[Table/Fig-5]: Maximum Intensity Projection (MIP) Computed Tomography (CT) image shows the total stone burden along the left DJS.

Following a discussion about the treatment plan patient underwent cystolitholapaxy with pneumatic lithotripsy, left ureteroscopy lithotripsy, and fragmentation of encrustation using a lithoclast up to the left kidney. An immediate post-procedural plain X-ray of the KUB revealed renal calculi and multiple stone fragments forming a steinstrasse in the distal part of the left ureter [Table/Fig-6]. In a subsequent session, patient underwent left-sided percutaneous nephrolithotomy for the renal calculi, and a new left Double-J Stent (DJS) was placed with a thread in the bladder [Table/Fig-7].

The patient recovered from the procedure without any immediate postoperative complications. He was educated about his condition, and the plan to remove the left DJS was communicated to his family members. An electronic reminder was also set up for the physician.



[Table/Fig-6]: Postoperative plain skiagram of KUB shows residual calculus along upper end of left DJS (white arrow) and left renal calculi. Multiple stone fragments forming steinstrasse (black arrow) are demonstrated in the distal part of left ureter.



[Table/Fig-7]: Postnephrolithotomy plain skiagram of KUB shows no residual calculus and replaced left DJS with thread in bladder.

DISCUSSION

Double-J stents (DJS) are commonly used to relieve obstruction caused by benign or malignant conditions, as a supplement to urolithiasis treatment, and to manage urine leaks and obstructive uropathy resulting from congenital or acquired causes. They help Urologists establish and maintain ureteral patency, prevent intraoperative ureteral injuries, and reduce the risk of postoperative strictures [1]. DJS placement is one of the most frequently performed urological procedure [2]. Typically, endoscopic procedures are sufficient to remove DJS. However, complications can still occur if, the stents are not removed or replaced within the recommended time frame [2].

Commonly reported complications associated with ureteral stent placement include urinary tract infection, malposition, migration, fracture, fragmentation, and encrustation of the stent. In some cases, DJS may even be forgotten or left in place for an extended period [3]. In the present case, the patient was lost to follow-up for one year due to the COVID-19 pandemic and subsequently presented with encrustation of the missed DJS, stone formation at the ends of the stent, and mild hydronephrosis. Literature reviews have reported complications associated with forgotten or retained stents for more than six months, including stent migration (40.9%), stent calcification (68%), stent fragmentation (45.5%), and fragmentation with calcification (13.6%) [4].

Previous case reports had described forgotten DJS retained for extended periods. For example, one case reported a forgotten DJS

after 10 years with a total stone burden of 123 mm [5]. Another case described a forgotten stent for five years with calculus formation along the entire 25 cm length of the DJS [6]. Neglected right-side DJS retained for five years were reported in a case with a giant bladder stone measuring 48 mm in the longest diameter [7]. Additionally, a previous case report described dual DJS on the left side with extensive encrustation and stone formation at both ends of the stents after being retained for three years [8]. Another case reported a fragmented, missed DJS in the bladder with a large calculus after two years of stent placement, although the size of the calculus was not mentioned [9]. In present case, within a year of missed follow-up, the patient developed a total stone burden of approximately 210 mm. Encrustations and stone formation on a stent have been linked to risk factors such as prolonged indwelling time, urinary sepsis, previous history of urolithiasis, chemotherapy, pregnancy, chronic renal failure, metabolic and congenital abnormalities [10]. In present case, authors believed that encrustation was aggravated by the presence of urinary tract obstruction, a staghorn calculus, and a co-existing urinary tract infection, as reported by Aboutaleb H [5].

The management options for long-forgotten DJS depend on the severity of the encrustation, the presence of renal or vesical calculi, the characteristics of the calculus in the DJS area, the presence of urinary tract infection, and the presence of urinary tract obstruction. Complicated DJS cases are managed using endourologic lithotripsy techniques and/or combined staged surgical procedures such as ESWL, ureteroscopic laser lithotripsy, endourological and percutaneous nephrolithotomy, and open surgical procedures [11]. In present case, the patient underwent combined staged procedures, including cystolitholapaxy with pneumatic lithotripsy, left ureteroscopy lithotripsy, and percutaneous nephrolithotomy. The patient recovered from the procedure without any immediate postoperative complications. The DJS was placed to maintain urinary tract drainage.

Aboutaleb H and Kim DS and Lee SH have recommended several strategies to prevent complications from DJS placement [5, 12]:

- DJS should be replaced or removed within an optimal time limit.
- Prophylactic antibiotic treatment is recommended in patients with indwelling stents to prevent infection.
- Patient and family member education about the presence of the stent is crucial.
- Feasible methods should be used to remind patients about the time for stent removal.

- Electronic methods or system-generated log-book registries can be used to remind physicians about stent removal.

In present case, following the combined staged procedures, the patient was educated about his condition. Patient's family members were informed about treatment plan from the beginning, and an electronic reminder was set-up for the physician to remove the DJS placed during the staged procedures.

CONCLUSION(S)

A missed DJS with encrustation along the entire length, presenting as a stony stent with the highest burden within a year, has not been reported before. The management of encrusted stents requires combined staged urologic procedures. Authors would like to emphasise the importance of educating patients and family members about the placement of the stent and the plan for its removal. It is recommended to implement electronic follow-up systems for patients with ureteric stenting and to set-up electronic reminders for physicians. These measures can help prevent lost to follow-up, mitigate long-term complications, and ensure patient safety.

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