An endourological management of 4-year-old bilateral neglected and encrusted ureteral stents

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Abstract

Double-J (DJ) stents are integral tools in the hands of urologists. Nonetheless, it might be associated with significant complications. Forgotten DJ stent is a commonly encountered problem. Herein, we present a case of a 42-year-old female patient who presented with extensively encrusted bilateral DJ stents, with bulky stones and encrustations at the entire course of the DJ stents on both sides. They were inserted 4 years ago with no follow-up. Multimodal endourological techniques were tailored to manage this difficult case. Cystolithotripsy, endoscopic combined intrarenal surgeries, and spontaneous bilateral endoscopic surgery were required to render her stone free.

Keywords: Encrusted Double-J stents, endoscopic combined Intrarenal surgery, percutaneous nephrolithotomy, simultaneous bilateral endoscopic surgery

INTRODUCTION

Double-J (DJ) stents are widely used in urology. An insertion of a DJ stent is usually performed as a temporary solution to relieve the obstruction before definitive surgery or for longer periods to relieve neoplasm-associated obstructions.[1] However, using DJ stents is associated with many complications including encrustations, migration, infection, stone formation, stent fragmentation, and occlusion.[2] Multiprocedure including extracorporeal shock wave lithotripsy, ureteroscopy (URS), cystolithotripsy, and percutaneous nephrolithotomy (PCNL) are often required for successful management of encrusted retained stents.[2]

Herein, we describe a case of bilateral encrusted DJ stents for 4 years. An endourological multimodality plan was tailored for the patient with consideration of her clinical and social status.

CASE REPORT

A 42-year-old female patient presented to the emergency room with bilateral flank pain, nausea, and vomiting. She underwent bilateral DJ stent insertion 4 years ago in another hospital with no follow-up. Normal general and local examinations were performed.

Workup showed leukocytosis and elevated creatinine level 2.94 mg/dl. Urinalysis showed positive nitrate and white blood cell >200/High Power Field (HPF). Urine culture grew Pseudomonas aeruginosa.

X-ray kidney ureter bladder
Multiple bilateral renal stones noted with bilateral DJ stents
with ureteric encrustation over them and over lower coils of both the stents in the bladder [Figure 1a].

Computed tomography of the abdomen/pelvis without contrast showed bilateral normal kidneys’ parenchymal thickness and bilateral multiple renal stones, largest in the left kidney measures 1.8 cm in lower calyces, with proximal ureteric stone. The right kidney had two lower calyceal stones, largest 1.9 cm, calcifications surrounding both DJ stents along their course involving both lower coils in the bladder [Figure 1b and c].

**Diethylenetriaminepentaacetate renogram**
The right kidney showed poor perfusion, poor excretion, and glomerular filtration rate (GFR): 19 ml/min, contributing to 71% of the renal function.

The left kidney had no perfusion and GFR was 8 mL/min, contributing to 29% of function, and total GFR was 27 ml/min.

**Intervention**
Bilateral nephrostomy tubes were inserted to relieve the obstruction and eliminate infection. Left nephrostogram showed no contrast draining to the ureter [Figure 2].

Both nephrostomy tubes were draining good urine output. One week post nephrostomy tubes insertion; her labs parameters improved.

**First procedure**
Cystoscopy with fragmentation of lower coils encrustations with holmium laser was done, followed by right semi-rigid URS with laser lithotripsy. The stent was cleared to the level of the upper ureter and was cut at that level. Intraoperatively, the patient developed volume overload and the anesthetist requested to terminate the procedure.

A new DJ stent was inserted. Multiple fragments were left in the ureter [Figure 3a].

We could not discharge the patient due to her socioeconomic status and her inability to come back to the hospital if discharged.

**Second procedure**
The patient underwent right endoscopic combined intrarenal surgery (ECIRS) to remove ureteral fragments via URS along with PCNL of the right kidney to remove the upper coil of the stent along with the right kidney stones.

The patient underwent right ECIRS, in supine Galdakao-modified Valdivia position. Right semi-rigid URS was done, while another surgeon performed right standard PCNL. After clearing all the stones in the right ureter, the surgeon proceeded to perform left semi-rigid URS with laser lithotripsy, simultaneously. Encrustations were peeled off the stent and were cut at the level of the upper ureter. Bilateral DJ stents were inserted and right nephrostomy tube was inserted along with Foley’s catheter. The procedure time was 2 h and 45 min, postoperative course was uneventful. X-ray of the kidney, ureter, and bladder (KUB) showed complete clearance of the right ureter and kidney, left upper coil encrustation with ureteric stone fragments [Figure 3b].

**Third procedure**
The patient then underwent left ECIRS, Left semi-rigid URS, and left standard PCNL.

Upper encrusted coil was removed through the sheath. Semi-rigid URS lithotripsy and basketing were done.
Complete renal and ureteric stone clearance achieved. Right DJ stent was removed and left DJ was inserted with left nephrostomy tube [Figure 3c]. Postoperative course was uneventful. The patient was discharged on the 4th day.

At follow-up 3 months later, the patient was doing fine, her symptoms resolved.

Follow-up diethylenetriaminepentaacetate showed split function in the right kidney: 45.0%, left: 55.0%, right kidney uptake: 1.74%, and (High Power Field) left kidney 14.0ml/min, which showed an improvement compared with the previous renogram.

DISCUSSION

Ureteral stent insertion is a common endourologic procedure that is carried out in many situations. Nonetheless, many complications are associated with DJ stent including stone formation, occlusion, encrustation, and associated stent symptoms. Managing forgotten encrusted DJ stents could be challenging and requires multimodality staged procedure. Acosta-Miranda et al. proposed a grading system for forgotten encrusted DJ stent consisting of 5 grades and an algorithm for management of encrusted stents based on the proposed system. Nonetheless, a personalized approach was carried out in our case considering multiple factors aiming to minimize the complications.

- Since both kidneys are affected, both nephrostomy tubes were functioning and improved creatinine level led to the decision to preserve both kidneys despite very low GFR. Acosta-Miranda et al. suggested nephrectomy for grade 5 forgotten encrusted DJ stents where there are diffuse and bulky encrustations completely encasing both of the DJ and ureteral parts of the stents if the renal function is <20%. However, in their proposal, the scheme for bilateral disease was not mentioned. In this case report, the renogram showed improvement in the GFR of both kidneys and total GFR despite the very low perfusion of the left kidney where nephrectomy is suggested
- Supine Galadkao-Valdivia position was chosen because of the advantage of allowing to perform ECIRS and SBES where PCNL and retrograde URS are done simultaneously.
- Trying to minimize hospital stay, operative occasions, and time, considering availability of instruments and qualified staff, ECIRS and SBES were chosen as treatment plans. Forgotten DJ stents could represent a challenge. Multimodality endourological management is required for treating such cases. A personalized approach is advised to manage such patients successfully. Entailing new endourological methods such as ECIRS and SBES could be safe and successful methods to manage these cases.

The patient consented to all the above-mentioned procedures and for the use of data for scientific purposes.

Declaratıon of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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