

Original Research Article

Tricks and tacks in the management of the forgotten double J stent

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ABSTRACT

Background: Double J ureteral stent has become the part and parcel of the routine procedure for the prevention or relief of upper urinary tract obstruction. Forgotten DJ stent can lead to encrustation, infection, migration, hydronephrosis and fragmentation.

Methods: Total 16 patients with forgotten double J stent at urology department of the tertiary teaching hospital from January 2014 to December 2016 were included in this retrospective study. The details reviewed included the indwelling time, presenting complaints, radiological and laboratory investigations, their management techniques and complications of the interventions.

Results: Twelve were male while 4 were female with mean patient age was 41.3 ± 10 years. Most common presenting complaints were lower urinary tract symptoms. Five had broken stent, two encrusted calcified stents while two were migrated to upper ureter. One patient was diagnosed as pyonephrosis while 6 patients were uncomplicated cases.

Conclusions: Stents, which are forgotten, can lead to morbidity in stented patients. Stent register should be made, and a computer-based tracking system has also been described to ensure the safety.

Keywords: Calcified stents, Complications of long term double J stents forgotten double J stent

INTRODUCTION

In today's era, double J ureteral stent has become the part and parcel of the routine procedure for the prevention or relief of upper urinary tract obstruction leading to hydronephrosis, ureteral trauma or strictures, malignant neoplasm and retroperitoneal fibrosis.¹ Nonetheless, their use can be accompanied by both short term and long-term complications. Most complications occur after prolonged indwelling of stents. Forgotten DJ stent can lead to encrustation, infection, migration, hydronephrosis and fragmentation. Here author present the experience of treating 16 patients of forgotten ureteric stents by adopting different techniques.

METHODS

Total 16 patients with forgotten double J stent at urology department of the tertiary teaching hospital from January 2014 to December 2016 were included in this retrospective study. Out of these 16 patients 11 cases were referred from outside while 5 cases were stented at the institute for various etiologies. The inclusion criterion was case with more than 6 months duration of the stent without prolonged stenting indication such as malignant obstruction. Initial assessment and diagnosis was made on the basis of history, physical examination and ancillary investigations. The details reviewed included the indwelling time, presenting complaints, radiological and laboratory investigations, their management

techniques and complications of the interventions. Plain X-ray and ultrasound was used as for the initial workup in all the cases.

RESULTS

Out of these 16 patients 12 were male while 4 were female with mean patient age was 41.3 ± 10 years (16-64 years). Most common presenting complaints were lower urinary tract symptoms (LUTS) followed by hematuria and flank pain (Table 1).

Table 1: Presenting complaints of the patients with forgotten DJ stent.

Presentations	Number of cases
LUTS	5
Hematuria	3
Flank pain	2
Recurrent UTI	2
Pyonephrosis	2
Stone formation	2

In these patients mean stent indwelling time was 34 months ranging from 10 months to 5 years. All patients underwent plain X-Ray and ultrasound Kidney ureter bladder (KUB) as first investigation (Figure 1).



Figure 1: X-ray KUB revealed broken DJ stent in situ.

Out of these 16 patients five had broken stent, two encrusted calcified stents while two were migrated to upper ureter (Figure 2,3). One patient was diagnosed as pyonephrosis while 6 patients were uncomplicated cases.

Out of six uncomplicated forgotten DJ stents five were removed by endoscopic techniques without any complications but one stent was broken during the procedure (Figure 4). This broken stent was removed percutaneously.

The pyonephrosis patient gave history of DJ stenting five years back and had deranged renal function tests at the

time of admission. In this patient ultrasound guided percutaneous nephrostomy (PCN) was done. After subsidence of acute symptoms stent was removed percutaneously.



Figure 2: Retrieved specimen of broken DJ stent.



Figure 3: The removed specimen of the DJ stent with encrustations.



Figure 4: Visualization of a forgotten sent with encrustations during cystoscopy.

After stent removal patient developed sepsis and needed intensive care unit for next five days. Urine culture showed *Klebsiella pneumoniae* and patient was then started on sensitive antibiotics for the same over 2 weeks.

Out of five broken stents three were removed by percutaneous nephrolithotripsy (PCNL) and remaining two was removed by ureteroscopy (URS). Two migrated stents were also successfully removed by URS only.

One encrusted stent was removed primarily with combination of PCNL and URS. But post-operative X-ray revealed residual fragments in renal area and required extracorporeal shock wave lithotripsy (ESWL) for fragments removal.

Other patient with encrusted stone also had large size bladder calculus so he was planned for two stage procedure. First surgery done was percutaneous suprapubic cystolithotomy (PCCLT), which was followed by combination of PCNL and URS after five days of primary procedure.

DISCUSSION

Though there has been no definition for “forgotten” as any such term does not exist, but many previous studies consider a variable period of greater than 3 to 6 months to constitute a forgotten stent.² The causes of forgotten ureteral stents could be classified as surgeon’s, patient’s, stent material and other factors; In a biochemical and optical analyses of stent encrustations by Robert *et al.*, they revealed that encrustations consisted mainly of calcium oxalate, calcium phosphate and ammonium magnesium phosphate.^{3,4}

Silicone containing stents are more resistant to encrustation in comparison to others and is followed by polyurethane, silitek, percutflex and hydrogel coated polyurethane.¹ Author use polyurethane stents at the center.

Studies have shown that poor compliance from the patient side is the major concern, which leads to forgotten DJ stent in situ, and it is reflected in present study as well.⁵

Okuda *et al* reported on 15 irremovable ureteral stents in Japanese patients. The mean indwelling times of these stents was 20 months.⁶ In a study by Ringel A *et al*, in total of 110 stented kidneys, they observed that the total complication rate was up to 32.7% and in 8.2% of the cases, the stents had migrated.⁷ Damiano R *et al* observed flank pain in 25.3%, encrustations in 21.6%, irritative bladder symptoms in 18.8%, hematuria in 18.1%, fever more than 104°F in 12.3% and stent migration in 9.5% of the patients.⁸ In present study, LUTS was the most common presenting complaint of the patients followed by hematuria and flank pain. Author noticed in present study that longer duration of stent retention was associated with

increased frequency of encrustations, infections, calculus formation and obstruction of the stented tract.

The available literature shows that DJ stent had been missed for a maximum of 23 years; in present study the maximum duration was of 6 years.²

Presently, there is no pre-defined algorithm for the management of the forgotten DJ stents and it depends on factors like the site of encrustation, the size of the stone burden and the function of the affected kidney and the management may often require multiple endourologic approaches and/or open surgeries. Kane *et al*, in Senegal reported in a comparative study of 89 patients with upper urinary tract calculi who underwent endourology intervention or open surgery and they reported that less complication and early discharge from hospital was observed in the endourology group.⁹

Lupu *et al* has described SWL as the non-invasive procedure of choice for calcified ureteral stents. SWL successfully fragmented calcifications on the renal end and ureteral segment of the stent, but electrohydraulic lithotripsy was necessary to fragment calcification on the bladder end.¹⁰ ESWL and flexible ureteroscopy retrieval of the stent has been reported to be non-invasive and effective first line therapy for encrustations located at the upper coil and or stent body. ESWL is however indicated mainly for localized, low volume encrustations.^{11,12} Flexible ureteroscopy with holmium laser lithotripsy is an alternative minimally invasive treatment option. Okeke *et al*, and Papoola *et al* showed in their studies successful endoscopic retrieval of the stent material with no complications.^{13,14}

Importantly, management modalities become more complex in case of severe incrustations which could require exploration of varied surgical options. Many investigators have employed ESWL, URS-Se, laser-lithotripsy, PCNL, chemolysis using various chemolytic agents administered via a percutaneous nephrostomy tube, and open surgery either alone or in combination with other procedures.^{15,16} Comparatively, single procedure removal of encrusted stent has also been reported, but it should be avoided for severely encrusted stents.⁵

As per the literature over enthusiastic single-stage removal is discouraged in case of long intraoperative time, and it is better to stage the procedure.² Ecke and colleagues have proposed that distal part of the stone burden should be removed first as it will facilitate the placement of the ureteric access catheter and then PCNL could be used for the stone- covered proximal end of the stent.¹⁷

Tang VC *et al* studied the stent card system to track the retained DJ stent and have proposed the computerized DJ stent registry and similarly Lynch MF *et al* in their study showed the importance of electronic stent register and

stent extraction reminder facility to avoid the DJ stent follow up loss and avoid the morbidity associated with it.^{18,19} McCahy et al. recommended that a computer record should be made recording the patients that stent was placed in urology clinics and warning and informing the urology physicians about the time of removal of stents.²⁰ Stents on strings have been proposed where one end of the stent is tied to a sting, which is externalized for easy removal later. Prevention is the best form of treatment to avoid this complication.

On interactive sessions, were found that the most common reason for the forgotten stent was lack of knowledge to the patient and the attendants for the same and it was seen in 13 patients. Of the rest 3 patients, two patients had forgotten themselves and one was lost to follow up till the patient had recurrent complaints.

CONCLUSION

DJ stenting is the most commonly used procedure in urological practice. Stents which are forgotten can lead to morbidity in stented patients. Stent register should be made where entries of all stented patients to be done immediately after doing the procedure. A computer-based tracking system has been described that automatically sends reminder to both the patient urologist's phones.

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