

Forgotten DJ Stent: A Retrospective Study

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ABSTRACT

Background: After endurological treatments, DJ stent has become one of the most widely employed treatment methods for urethral drainage. Long-term stent holding, however, may result in encrustation, stone forming, fracture & stent blockage, hydronephrosis & occasionally kidney function failure. The aim of our study is to evaluate patient of forgotten stents and their management.

Methods: We retrospectively analysed the records of 23 patients presented with forgotten ureteric stents to urology department between March 2010 and august 2018 was included in the study.

Results: A total of 23 patients were identified or referred to our clinic with history of lost DJ stents during the eight-year review. Four patients have serious ureter and vesical encrustations. Ten cases have stents with fracturing and incomplete parts of stents and six had numerous kidney, ureteric and vesical calculus. To remove the stones and insert the DJ stent, a mixture of PCNL, ureteroscopy, ESWL and open surgery was done. The list of Stent reported a marked decline in concentrations of misplaced DJ stents.

Conclusion: Failed or held stent is a cause of serious morbidity and financial strain as well. Pre-operative and post-operative counseling of the patient regarding the DJ stent is necessary.

Keywords: DJ stent, endourology, forgotten.

INTRODUCTION

Zimskind et al. reported using DJ stents in 1967. [1] Since then, during the treatment of ureteral congestion, ureteral stents are used to preserve ureteral patency. Different problems in the short term and in the long term when stents were kept in place for a long time. Infection, haematuria, suffering cause short-term problems. Nevertheless, long-term stent retention may result in encrustation, fracturing and forming of stones, fracture and stent blockage, hydronephrosis. The incidence of encrustation increases with the duration that the stent remains indwelling. Therefore, DJ stent (figure 1) needs to be replaced or removed within 6 weeks to 6 months.



Figure 1: DJ Stent

Forgotten ureteral stents after 1 year were extensively encrusted and required additional treatment modalities such as shock wave lithotripsy (SWL), ureteroscopy (URS) and percutaneous nephrolithotomy (PCNL) for both effective removal and treatment. [2] The aim of our study is to evaluate patient of forgotten stents and their management.

MATERIAL AND METHODS

A total of 23 patients were presented with forgotten ureteral stents to urology department, Himalayan Institute of Medical Sciences between January 2010 and January 2018. Fifteen patients were referred from outside hospitals, and eight patients were institute cases. All patients’ data was collected and analyzed retrospectively for duration of double J (DJ) Stent, presenting complaints, types of previous procedure and current procedure. Renal function tests, urine microscopy and culture & sensitivity were done in all patients.

All the patients were evaluated for stent encrustation and associated stone burden by plain film radiography and intravenous urogram. In patients with non visualized kidneys on intravenous urogram, Tc99m diethylene triamine penta acetic-acid (DTPA) renogram was done to estimate the renal function. Treatment decision was made based on clinical and radiological findings.

Statistical analysis: Collected data was entered in excel sheet and analysed using SPSS version 22.

RESULTS

Total 23 patients record were analysed over the period from January 2010 and January 2018. Out of which 15(65.2%) were male and 8(34.4%) were females. Age ranged from 20 years to 60 years. Duration with stent in situ ranged from 1 year to 20 years (table 1).

Presenting complaints of recurrent fever 12 (52.1%), dysuria 20 (86.9%), flank pain 19 (82.6%), haematuria 20 (86.9%) amongst patients were noted (table 2). Out of 23

patients, 15 patients underwent procedure at outside centre and were referred here for further management. Only 11 (47.8%) were aware of DJ stent being inserted. And 12 (52.1%) patients were not counselled regarding the insertion of DJ stents.

Out of 23 patients 10 (43.4%) patients underwent ureteroscopy, 5 (21.7%) patients had PCNL, 5 (21.7%) patients had adjunct DJ procedure, 2 (8.6%) patients underwent open surgery and 1 (4.34%) patient underwent pyeloplasty (table 3).

Out of 23 patients, 4 (17.3%) patients had severe encrustations with both ureters and vesical calculi, 4 (17.3%) had either only renal or vesical calculi, 7 (30.4%) had fracture stents and vanishing portions of stents and 6 (26.06%) had multiple renal, ureteric and vesical calculi (table 4).

Table 1: Distribution of subjects according to duration of stent

Duration of stent	No. of pts.
<1 year	16
>1year to < 5 years	4
>5years to < 10 years	2
>10 years	1

Table 2: Distribution of subjects according to clinical presentation

Clinical presentation	No. of patients
Dysuria	20
Haematuria	20
Flank pain	19
Recurrent fever	12

Table 3: Indication for stent placement

Indications	No. of patients
PCNL	5
URS	10
Open surgery	2
Pyeloplasty	1
Adjunct DJ procedure	5

Table 4: Site of encrustation among the study subjects

Site of encrustation	No. of patients
Kidney	4
Ureter	5
Bladder	8
More than one site	6

Table 5: Types of procedure performed for DJ removal among the study subjects

Types of procedure	No. of patients
CLT +DJR	4
URS +CLT+DJR	4
URS	3
PCNL +CLT+URS+DJR	7
Anterograde removal then PCNL	4
DJR	1

Nowadays patients were treated with multimodality of treatment. In some cases more than 2 procedures were done. 7 patients (30.4%) with multiple stones in ureter, vesical & kidney were treated with CLT+URS+PCNL, 4 patients (17.3%) with bladder stone were treated with CLT+DJR while 4 (17.3%) patients with ureteric & vesical stone were treated with CLT+URS. 1(4.3%) patient underwent only DJR and in 7(30.4%) patients with fracture stent-3 patients (42.8%) were treated with URS while in 4(57.1%) patients anterograde removal of stent done through PCNL (table 5).

DISCUSSION

For urological research, DJ ureteral stents are commonly used¹. In the event of extrinsic or intrinsic blocking of the urinary passage, these stents are used to create or enhance drainage. We are also put in complicated abdominal surgeries^[2] following iatrogenic trauma to the ureter & prophylactic. Biocompatible, radiopaque, and cost-effective should be a perfect ureteral stent. It should relieve ureteral congestion intra / extra, avoid encrustations, and prevent infection. For this reason, there are no suitable double J ureteral stents available.

The pain of the patient was significantly reduced due to technological advances in stent design & stent biomaterial. As a consequence of which the patient and the doctor can forget their presence. Such overlooked ureteral stents may cause various problems such as stent movement, stent occlusion, breakage, encrustation and forming of stones.^[3-6]

During urological research, lost ureteral stents are found due to poor patient behavior or the doctor's failure to adequately inform the patient. Such stents that have been overlooked will produce significant morbidity and mortality. Encrustation with lost stents is a serious problem due to complications such as chronic urinary tract infection, hematuria, congestion and renal failure.^[7]

Likewise, in the majority of patients engaged in stone development in ureter, vesical or renal or numerous stones at multiple sites, encrustation was seen in our research. In both contaminated and sterile urine, deposition of incrustated material on retained ureteral stents can occur. The encrustation process of contaminated urine is the product of the crystallization of organic compounds in the urine on the bacterial biofilm present on the stent. To generate ammonia, the urea formed by the adhered bacteria hydrolyses the urea. This raises urinary pH and encourages magnesium and calcium accumulation as struvite and hydroxyl apatite.^[8,9]

With the length of stent placement, the likelihood of injury decreases. Many writers recorded a healthy residence time of 2 to 4 months, after which the exchange of stent should be carried out under antibiotic prophylaxis. El Faqih et al.^[3] observed that encrustation rose from 9.2% at < 6 weeks to 47.5% at 6 to 12 weeks to 76.3% at > 12 weeks of living time¹⁰. Certain factors involved in the increased incidence of encrustations are frequent recurring formers of stones, genetic predisposition to stone disease, congenital renal defects and malignant urinary obstruction.^[11]

Similarly in our study encrustation is seen in majority of those patients in whom stent left for >1 year. The management of ureteral stents with encrustation depends on site of encrustation, the size of stone burden and the function of affected kidney. Several approaches like extracorporeal shockwave lithotripsy, ureteroscopic lithotripsy, percutaneous nephrolithotomy, and open procedures are used depending on necessity and severity of encrustations.^[12-15]

Extracorporeal lithotripsy shockwave can be used as a non-invasive first-line treatment for isolated small stones to the kidney and upper coil and ureter encrustations. Ureteroscopy with pneumatic or ultrasonic lithotripsy or laser lithotripsy may be used as the first alternative for ureter encrustations and for lithotripsy failure cases of extracorporeal shockwave.

Cystolithotripsy, cystolithopaxy, handles encrustations affecting the lower wire. There is often a need for percutaneous nephrolithotomy or open pyelolithotomy when these procedures are ineffective or there is a large stone strain. Fragmentation is another big issue in stents that have been overlooked. It is the product of the lack of tensile strength arising from the stent polymers being hardened and degenerated.

^[16] The possibility of fracture and encrustation depends on the stent's type of material. It has been observed that silicone is less susceptible to encrustation, accompanied by polyurethane, silitek, percuflex and polyurethane-coated hydrogel. ^[17] Polyurethane stent fragmentations are four times as common as the stents of silicone.

We observed in our study that retained ureteral DJ stents caused patients significant morbidity. Recurring fatigue, such as hematuria, dysuria & flank discomfort. Approximately 60 percent of patients were not adequately informed about the location of the stent and the need to extract the stent in due time.

CONCLUSION

The prescribing practitioner should have a thorough knowledge of suitable stent placement signs and should be highly selective in stent placement. The long-term risks of indwelling stents and the necessity of withdrawal should be recommended to all patients. Therefore, it is necessary to maintain clear documentation of all stents and their due date of removal.

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