

Our experience of forgotten double-J stents in a tertiary care center



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ABSTRACT

Background: Double-J (DJ) stents have become an essential tool in the field of urology. Forgotten DJ stents are associated with significant morbidity and mortality, if not intervened timely. **Aims and Objectives:** In this study, we report our experience of forgotten stents related complications, along with its management and steps taken by us in preventing stent-related morbidity. **Materials and Methods:** We retrospectively analyzed the records of patients presented to the Department of Urology, Indira Gandhi Institute of Medical Sciences, Patna with forgotten or long-term retention of DJ stents from January 2021 to December 2022. All cases were reviewed for age, gender, symptoms, indication of stent insertion, duration of stent insertion, radiological images, and procedures performed for management. **Results:** The mean age of the patients was 49.23 years. The mean duration of the indwelling stent *in situ* was 16.61 months. Presenting complaint was flank pain, recurrent urinary tract infection, dysuria, hematuria, and irritative lower urinary tract symptoms. Common indications of indwelling stents were ureteroscopic lithotripsy, percutaneous nephrolithotomy, and Laparoscopic pyeloplasty. Cystoscopy, ureteroscopy, cystolithotripsy, percutaneous nephrolithotomy, and open surgery were done to extract the forgotten DJ stent. **Conclusion:** Forgotten DJ stents are a source of severe morbidity. Patients and relatives counseling before and after the procedure is necessary in reducing stent-related complications.

Key words: Complications; Forgotten double-J stent; Management

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INTRODUCTION

Double-J (DJ) stents have become an essential tool in the field of urology since 1967.¹

DJ stent is a tube placed within the ureter for maintaining its patency.² DJ stent provides a self-retaining capability due to its double coil design at both ends that securely anchor the stent into the renal pelvis and into the bladder. This prevents stent migration up or down despite ureteral peristalsis, urinary flow, and patient movement.

DJ stents are used after renal or ureteral surgeries and to overcome ureteral obstruction due to intraluminal causes such as stones, intrinsic causes such as strictures and for extrinsic causes such as retroperitoneal fibrosis, malignancies, and congenital anatomical anomalies.¹ They are also used after iatrogenic injuries to the ureter and before

any complex abdominal procedure for identification and protection of the ureters to prevent iatrogenic injuries.^{1,3}

In general, DJ stent needs to be replaced or removed within 6 weeks–6 months.^{3–6} otherwise prone for complications such as urinary tract infections, hematuria, pain, encrustations, fragmentation, secondary stone formation, migration, stent fractures, and blockades.^{4,7}

At times, stents may be forgotten by the patient which can lead to significant morbidity due to longer indwelling duration.⁸ As much as, 12% of DJ stents are retained or forgotten.⁹

Sepsis and renal failure are known complications of forgotten DJ stents¹⁰ increasing the overall treatment costs. Removal of forgotten DJ stent is a challenge in itself and requires complicated endourologic procedures.

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In this study, we report our experience of forgotten DJ stents in a tertiary care center.

Aims and objectives

In this study, we report our experience of forgotten stents related complications along with its management and steps taken by us in preventing stent-related morbidity.

MATERIALS AND METHODS

This was a retrospective study conducted in the Department of Urology at Indira Gandhi Institute of Medical Sciences, Patna, over a period of 2 years (January 2021–December 2022).

A total of 13 patients included who met the eligibility criteria of forgotten DJ stent (>6 months). Data were collected and analyzed retrospectively for duration of DJ stent placement, presenting complaints, and type of previous procedure performed for DJ placement.

Lost to follow-up, poor compliance, and lockdown due to COVID pandemic were the most common causes for forgotten DJ stent.

All the patients were evaluated with the medical history as well as socioeconomic status according to modified Kuppuswamy scale.¹¹

All patients were evaluated by X-ray kidney, ureter, bladder (KUB), ultrasound abdomen, urine analysis, and serum creatinine. Non-contrast computed tomography abdomen was performed mainly for fractured or broken stent. In patients who presented with renal stone, along with forgotten stent, intravenous pyelography was advised. Treatment was proposed on the basis of clinical and radiological investigations. Modes of intervention were individualized for all patients depending on radiological findings. Negative urine culture was confirmed before intervention.

Post-procedure, X-ray KUB was done to confirm the stent-free status.

RESULTS

Total 13 patients, data were scrutinized over the period of 24 months (January 2021–December 2022). Out of which 10 (77%) were male and 3 (23%) were female. Age ranged from 32 years to 64 years with mean age of the patients was 49.23 years. Duration with stent *in situ* ranged from 6 months to 4 years. The mean duration of the indwelling stent *in situ* was 16.61 months.

Presenting complaints with which patients consulted urology department of our institute were of flank pain (n=4; 30.7%), recurrent UTI (n=3; 23.07%), dysuria (n=2; 15.38%), hematuria (n=2; 15.38%), and irritative lower urinary tract symptoms (LUTS) (n=2; 15.38) (Table 1).

Out of 13 patients, 4 (30.76%) patients had encrustations with either renal or vesical calculi among which one patient presented with fragmented stent protruding per urethra (Figure 1).

Three (23%) out of 13 patients had fracture stent.

Table 1: Presenting symptoms

Complications	Number of cases
Flank pain	4
Recurrent UTI	3
Hematuria	2
Irritative LUTS	2
Dysuria	2

LUTS: Lower urinary tract symptoms



Figure 1: X-ray KUB showing fragmented stent in the left renal area with the lower coil in bladder migrating into urethra



Figure 2: X-ray KUB showing forgotten stent

One patient having CKD undergoing hemodialysis was referred from nephrology department for removal of forgotten stent (Figures 2 and 3).

The indications of indwelling stents are summarized in Table 2. Most common indications for stenting were URSL (38.46%) and PCNL (23.07%).

Table 3 describes the procedures performed for removal of DJ stent. Most of the stents were removed by cystoscopy with some required complex and few needed more than one procedure. PCNL and cytolithotripsy required in managing a patient having renal stone as well as bladder stone, as shown in Figure 4.

Several complications were noted after forgotten stent removal such as fever (30.76%), sepsis (15.38%), and hematuria (23.07%).



Figure 3: The removed encrusted stent from the patient after cystoscopy



Figure 4: X-ray KUB showing fragmented DJ stent in the right renal region with calculus and lower coil in bladder with encrustation around coil

DISCUSSION

After the introduction of DJ stent in 1967, it is widely used in various urological procedures to prevent or relieve upper urinary tract obstruction.¹ The indications for stent insertion have increased and the patients presenting with complications of stent have become more frequent. If DJ stent is kept for long duration or forgotten, leads to significant morbidity to patient.

Presenting complaints of forgotten DJ stent may vary. In our study, flank pain (30.7%) and recurrent urinary tract infection (23.07%) reported as most common presenting symptoms. In a study by Damiano et al., flank pain was observed in 25.3%, storage LUTS in 18.8%, and hematuria in 18.1%.¹² They also reported that morbidity and complications were minimal when the stent was left *in situ* for <3 months.

Study by Pansota et al., showed that 32.5% of patients presenting with irritable bladder symptoms were the most common complications of DJ stenting. The incidence of fever and hematuria in this study was 20% and 27.5%, respectively.¹³

The incidence of complications related to stent increases with the duration of the stent; hence, it is important that it should be removed or replaced on time.³⁻⁶ We found stent encrustation with stone formation and stent breakage as common complications in our study.

In a prospective study conducted by Bansal et al., the most common complications were found to be flank or suprapubic pain followed by dysuria, hematuria, frequency, and urgency. Encrustation was found in 42% of the patients at the time of stent removal. Stent migration to the bladder was rare, that is, 1%.¹⁴

Table 2: Indications of indwelling stents

Indications	Number of cases (%)
URSL	5 (38.46)
PCNL	3 (23.07)
Laparoscopic pyeloplasty	2 (15.38)
ESWL	2 (15.38)
Open pyeloplasty	1 (7.69)

URSL: Ureteroscopic lithotripsy, ESWL: Extracorporeal shock wave lithotripsy, PCNL: Percutaneous nephrolithotomy

Table 3: Procedure performed for DJ stent removal

Procedure	Number of cases (%)
Cystoscopy	6 (46.15)
Ureteroscopy	2 (15.38)
Cystolithotripsy	2 (15.38)
PCNL	2 (15.38)
Open procedure	1 (7.69)

A study by Nawaz et al., reported that stent encrustation and stent migration in 10.5% and 3.5% cases, respectively.¹⁵ Similarly, Memon et al., and Arshad et al., observed stent encrustation in 17.5% and 2.0% and stent migration in 11.7% and 16.3%, respectively.^{16,17}

In a case report by Gupta et al., and another by Puri et al., large calculus was developed due to forgotten DJ stent in a patient with ileal conduit diversion.^{18,19}

Treatment of forgotten DJ stent was individualized according to severity of symptoms and radiological findings. In our study, endourological procedure was mostly performed for stent extraction. Rana and Sabooh; Patil et al., expressed similar results.^{20,21} Customarily, cystoscopic intervention is sufficient to remove the bladder stents. Extreme care should be kept in mind to prevent any urethral trauma while retrieving an encrusted stent. A percutaneous cystoscopic route should be preferred when there is risk of urethral injury. Retrieving a proximally fragmented ureteral stent may require ureteroscopic, percutaneous, or open approach as it can be technically problematic.

Cystoscopy was the most commonly performed procedures for forgotten DJ stent removal in our study with one patient requiring open surgery due to extensive encrustation. Several studies describe the management of forgotten DJ stent with endourological approach.^{22,23}

In the present study, we enquired about the socioeconomic status of patients and found that most of them presenting with forgotten DJ stent belongs to poor socioeconomic background and having low education status. Forgotten stents are observed due to poor compliance of the patient. Pal et al., also reported poor compliance of patients as the main cause for forgotten DJ stent.²⁴

Follow-up of stented patients has been adversely affected by the COVID-19 pandemic and lockdown. Lockdown was instituted to prevent the transmission of the virus but hampered the care of such patients. Most of our patients were from rural background, and they were reluctant to come for follow-up in view of limited public transportation facility. Similar condition encountered during Syrian conflict where most patients were not allowed to visit hospitals was reported by Al-Hajjaj et al.²⁵

A forgotten stent is a financial burden on the society, mostly affecting those belonging to the low socioeconomic group.²⁶

Failure of the surgeon to counsel the patient with respect to the complications of long-indwelling DJ stents and timely removal also contribute to this problem. Therefore,

it is important to keep records of stented patients so that it become easy to trace them and called on for timely removal or to replacement of the stent.²⁷ In our institute, we are counseling the patient as well as relatives about the long-term complications of the stent. We are showing them post-surgery X-ray as well as mentioning about stent removal on discharge card.

Limitations of the study

It was a retrospective study. In absence of specific guidelines, operative management of forgotten stents was based upon guidelines for urolithiasis.

CONCLUSION

DJ stent has become an essential part of urological practice. Forgotten stents produce lot of morbidity. In a developing country like India, it also puts financial burden to patient. Endourological procedure is required mostly with some of them requiring open surgery for the management of such patients. Proper counseling of patient and relatives regarding DJ stent and maintaining a record may help in reducing the incidence of forgotten DJ stent.

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