

Forgotten Ureteral Double J Stents and Their Management- Our Institutional Experience

¹Rajkumar R, Department of Urology, G.M.K.M.C.H, Salem, Tamil Nadu, India.

²Periasamy Ponnusamy, Department of Urology, G.M.K.M.C.H, Salem, Tamil Nadu, India.

³Rajasekar Sundaram, Department of Urology, G.M.K.M.C.H, Salem, Tamil Nadu, India.

⁴Sammohit Gulakavarapu, Department of Urology, G.M.K.M.C.H, Salem, Tamil Nadu, India.

Corresponding Author: Rajkumar R, Department of Urology, G.M.K.M.C.H, Salem, Tamil Nadu, India.

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Abstract

Introduction: Double-J (DJ) stents are the basic and most commonly used tools in urological practice. DJ stent usually needs to be exchanged or removed within a period of 6 weeks to 6 months as to avoid complications like encrustations, calculus formation, fractures and blockage of stents. However, in many cases the stent will be forgotten. In this Retrospective study we reported our experience in the treatment of forgotten stents and steps taken by us in preventing DJ stent-related morbidity.

Results: Of the total of 35 patients treated the mean age of the patients was 58.5 years. The mean duration of the indwelling stent in situ was 14.5 months. These stents are placed during various urological interventions such as extra corporeal shock wave lithotripsy (ESWL), Retrograde intrarenal surgery (RIRS), Ureteroscopic lithotripsy (URSL) & percutaneous nephrolithotomy. Complaints for which patients visited hospital were flank pain (n= 12; 34.28%), dysuria (n= 9; 25.71%), hematuria (n= 3, 8.57%) and fever (n= 2; 5.71%).

Conclusion: Forgotten/Retained Double J stents can be a lead to severe morbidity. Patients and their attendant’s educational levels, their ability to comprehend the advice and counseling before and after the procedure may play a significant role in reducing stent-related complications.

Keywords: Complications, Forgotten double-J stents, Counseling.

Introduction

Double-J (DJ) stents are the most basic and commonly used tools in urology after foley’s catheters in many procedures since its first introduction in 1967 by Zimskind et al. [1]. These stents maintain the ureter patency and ensure resolution of any edema and allow for healing of any injury. Hence, it is considered as a very effective method in post-operative management in patients with ureteric stricture, ureteric calculi, retroperitoneal tumors or fibrosis, Pelvi ureteric junction obstruction or in any iatrogenic ureteric injury. In patients with obstructive uropathy secondary to urinary calculi, DJ stent is generally the first choice of treatment. However, there are several morbidities associated with the use of DJ stents. Zimskind et al. also reported

complications associated with the use of DJ stents [1].

The DJ stent has been known to have various complications. Short-term complications are pain, infection, hematuria, and stent syndrome. Long-term duration of stents can lead to stone formation, encrustations, fractures and obstruction of stents, hydronephrosis and in few patients leads to loss of kidney function. The incidence of encrustation over Double J stent increases with the duration that the stent remains inside the genitourinary system [2]. It has been reported that the stent encrustation rates are 9.2%, 47.5% and 76.3% if stent remains indwelling for 6 weeks, 6–12 weeks and more than 12 weeks, respectively [3]. The DJ stent generally needs to be replaced or removed within 6 weeks to 6 months [36]. There are several reports available on the forgotten DJ stents [7–9]. Various procedures are described in the literature for the removal of DJ stents. The type of procedure depends upon factors like extent and location of encrustation, stone formation sites along the length of the stent & whether stent is broken, etc. It is very much important that all patients who undergo stenting should be counseled for the long-term complications of indwelling stents and the importance of their removal or replacement. Forgotten ureteral stents, especially those longer than one year, are heavily encrusted and may need supplementary procedures like shock wave lithotripsy (SWL), ureteroscopy (URS) and percutaneous nephrolithotomy (PCNL) alone or in combination for complete treatment [7, 10]. In this paper, we share our experience in the management of forgotten/retained stents and precautions taken by us to prevent DJ stent-related morbidity.

Methods

This was a retrospective study conducted at the Department of Urology, Govt Mohan Kumaramangalam

Medical College & Hospital, Salem, over a period of 24 months (May 2018 to May 2020). A total of 35 patient's data are collected from medical records, those who met the eligibility criteria of forgotten DJ stent (> 6 months), and other factors like duration of indwelling DJ stent, presenting symptoms, and type of previous intervention were noted. Additionally, new procedures performed for the removal of DJ stent and any associated complications were noted. The patients who are included in this study are those referred from peripheral hospitals as well as previously operated at our institute. All the patients were completely evaluated starting from taking history, recording socioeconomic status and literacy. All the patients underwent ultrasonography kidney ureter-bladder (KUB), X-ray KUB, urine analysis and serum creatinine. All patients are subjected to non-contrast computed tomography (CT) when indicated (mainly for radiolucent calculi and fractured or broken stents & stone formers over the stent). Urine culture & sensitivity was done for all patients. Sterile urine was ensured before intervention. The treatment plan was decided on the basis of investigations. Over the last few years, we have formulated a new set a protocol in our Hospital about detailed counseling for the patients with DJ stents. Our hospital database also maintains records of all the patients with DJ stent placement, which include name, age, sex, diagnosis, procedure done, date of surgery, due date of stent removal and contact details. We also take the patient's & patient relative's contact number & signature on discharge card making sure that they should not miss follow-ups. In case a patient doesn't visit us again for the stent removal or exchange, reminder call is given.

Results

A total of 35 patients were enrolled in this study. In all cases, polyurethane stents were used. The mean age of

the patients was 58.5 years, and the age ranged from 21 to 67 years. Of the 35 participants, 23 (65.71%) were males and 12 (34.28%) were females. The mean duration of the indwelling stent in situ was 14.5 months, and the duration ranged from 6 months to 17 years. 10 patients had education above higher secondary level, 8 patients had education below higher secondary level, and 17 patients were illiterate. All the patients are from mixed localities both from rural & urban India mostly belonging to poor socioeconomic background.



Fig. 1: Retained stents removed in our institution

Fifteen patients forgot about their stent, and in 6 patients, there was history of inadequate counseling by urologist. The indications of stenting are shown in Table 1. Most common indications for stenting are URSL (55%) and PCNL (25%). A total of 30 patients had encrustations, and 3 patients had fractured stent. Table 2 summarizes chief complaints for which patients visited hospital (for forgotten DJ stent). Presenting complaints were dysuria (n= 23; 65.71%), storage lower urinary tract symptoms (n= 16; 45.71%), hematuria (n= 12, 34.28 %), flank pain (n= 10; 28.57 %) and recurrent urinary tract infection (n= 8; 22.85 %). Some patients required multimodality approach with few patients requiring more than 2,3 procedures and also staged procedures for removal of indwelling stents (Table 3). In 22 (62.85 %) patients, URS was required. PCNL, cystoscopy and DJ stent removal, mechanical cystolithotripsy (CLT) and open procedure for stent removal were required in 13 (37.14%), 5 (14.28%), 5 (13.33%) and 2 (5.71%)

patients, respectively. (Fig. 1). In open procedures the whole length of ureter was not incised and we took the incision only at places with stone burden and then by slow gentle milking we could retrieve the stent. 1 patients had fractured upper end of stent. He was managed initially with URS and later PCNL for complete removal of stent on the left side. Several complications were noted during or after forgotten stent removal like fever (15%), sepsis (4%), hematuria requiring transfusion (2%) and stent fragmentation (8.3 %)



Fig 2: X-ray KUB of Retained DJ stent



Fig 3: CT KUB showing Retained DJ stent with stone Formation

Table 1: Indication for stenting

Indications	Number of cases
Ureteroscopic lithotripsy	15
Percutaneous nephrolithotomy	9
Open pyeloplasty	3
Extracorporeal shock wave lithotripsy	4
Laparoscopic pyeloplasty	3
Ca cervix with HUN	2

Table 2: Presenting symptoms

Complications	Number of cases (range of symptoms)
Dysuria	23
Storage lower urinary tract symptoms	16
Hematuria	12
Flank pain	10
Recurrent UTI	8

Table 3: Procedures done for stent Removal

Indications	Number of cases (range of duration of procedure)
Ureterscopy	22 (10 months to 11 years)
Percutaneous nephrolithotomy	13 (11 months to 9 years)
Cystoscopy and DJ removal	5 (6 to 15 months)
Mechanical cystolithotripsy	2 (8 to 19 months)
Open procedure	2 (7 to 15 years)

Discussion

Since the introduction of DJ stenting in 1967 by Zimskind et al., it is commonly used in various Genito urinary procedures¹. As much useful these Double J stents are, they will also be the cause for severe morbidity if forgotten, and kept for long duration causing significant morbidity to patient.

We studied socioeconomic status of patient. We found that patients presenting with forgotten DJ stent were not only from poor socioeconomic background and having low education status but also the educated. Most of our patients were from rural background, and they were reluctant to travel to tertiary care center in view of poor

transportation facility and cost of transportation involved. Singh et al. also reported poor compliance of patients as the main cause for forgotten DJ stent¹¹. Improper and hurried counseling by physician also contributed to this problem to certain extent. Many of the stents which are to be removed during March - July 2020 missed their follow up as they were unable to visit the Hospital due to restrictions in covid 19 lock down period. Due to which despite of the socio economic background many patients didn't get their stents Removed. Presentation of forgotten DJ stent may vary. We found dysuria (80%) and storage lower urinary tract symptoms (53.33%) as most common presenting symptoms. In a study by Damiano et al., flank pain (25.3%) and storage lower urinary tract symptoms (18.8%) were most common symptoms¹². The complications related to stent are directly proportional with the duration of the stent; so, it is important that it should be removed or exchanged in time³⁻⁶. In our study, encrustation, stent breakage and recurrent urinary tract infections and hematuria were common complications. In a study by Nawaz et al¹³, the common complications reported were stent encrustation (10.5%), stent migration (3.5%) and stent breakage (4.5%); similarly, in another study, stent encrustation (24.5%), stent migration (9.5%) and stent breakage (1.3%) were reported as common complications¹². In another case report, bilateral staghorn calculus was developed due to forgotten DJ stent in a patient with ileal conduit diversion 6 years back¹⁴. Similarly, Puri et al. reported a large calculus encrusted over a forgotten DJ stent in an ileal conduit patient with urinary diversion 8 years earlier¹⁵. Treatment of forgotten DJ stent was planned according to extent and severity of encrustation and whether stent was broken. In our study, most patients were managed by endourological approach with few patients requiring open surgery. Multimodality treatment was required in most patients. Similar results

were reflected in several other studies as well^{16, 17}. URS and PCNL were most commonly performed procedures for forgotten DJ stent removal in our study with 3 patients requiring open surgery. Several studies describe management of forgotten DJ stent with endourological approach^{7, 18}. We required open procedure in two patients because of severity of encrustation. We are now concentrating more on patient as well as relative counseling and their active involvement in follow-up. We are taking patient and relative's signature on discharge cards after counseling, and we are showing them post-surgery X-ray KUB explaining them the presence of stent. When patient is lost to follow-up, we communicate with them via telephone or mail. This has helped us in significantly bringing down incidence of forgotten DJ stent.

Conclusion

Forgotten DJ stent is still a common problem in developing world, and it also brings lot of morbidity and financial burden to patient. This also increases strain on resources and infrastructure which is already limited in developing countries. In most of patients, endourological procedure is required for management of such cases with few requiring open surgery. Proper education and counseling of patients and relatives before and after procedure and maintaining stent register may help in reducing incidence of forgotten DJ stent.

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