

Multimodal management of forgotten encrusted ureteral stents

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Abstract

Background: Endourological management is the main treatment modality for forgotten encrusted ureteral stent. Sometimes extracorporeal shockwave lithotripsy and even open surgery may be needed to remove these forgotten ureteral stents.

Objectives: To evaluate the efficacy and feasibility of different endourological approaches like percutaneous nephrolithotomy, ureteroscopic lithotripsy, cystolithotripsy and extracorporeal shockwave lithotripsy in the treatment of forgotten encrusted ureteral stents.

Methods: Total of ten patients with forgotten encrusted double J stents from Jan 2013 to Nov 2015 were included. Mean age of the patients was 38.4 years (1.5 -5 years). All patients were evaluated for stent encrustation and associated stone burden by X-ray Kidney Ureters and Bladder and Intravenous Urography. Combined endourological procedures like percutaneous nephrolithotomy, ureteroscopic lithotripsy, cystolithotripsy and extracorporeal shockwave lithotripsy and even open surgery was done to remove these stents. Patients characteristics, indications for stenting, indwelling time, site of encrustation, hospital stay etc were all noted.

Results: Total of ten patients presented to us with forgotten Double J stents. Majority of the patients had undergone surgery before. Out of three patients with large encrustations both in renal pelvis and urinary bladder, one patient underwent percutaneous nephrolithotomy and cystolithotripsy. Rest two patients underwent extracorporeal shockwave lithotripsy for two sessions for renal pelvic encrustation and cystolithotripsy for urinary bladder encrustation. Four patients underwent ureteroscopic lithotripsy and cystolithotripsy. Two patients in whom all fractured coils were in urinary bladder, underwent cystolithotripsy. All the stents were removed under C-arm fluoroscopic guidance. In one patient open ureterolithotomy was done to remove the knotted stent.

Conclusion: The use of Double J stent should be limited to those patients where the benefits override the possible complications. The combination of various endourological techniques and extracorporeal shockwave lithotripsy can achieve effective stent and stone treatment with minimal morbidity and hospital stay.

Key words: Cystolithotripsy, Extracorporeal shock wave lithotripsy, Percutaneous nephrolithotomy, retrograde ureteroscopy, ureteral stents, ureteric lithotripsy.

INTRODUCTION

The use of Double J ureteral stent has become an integral part of the urological practice. It allows good urinary drainage from kidney to bladder and is generally safe and well tolerated. They are mainly indicated after ureteral and renal surgery and are used for managing ureteral obstruction due to stones, strictures, ureteropelvic junction obstruction,

retroperitoneal fibrosis etc¹⁻⁵. They are also used after iatrogenic injuries to ureter and before any complex abdominal procedure for identification and protection of ureters⁶. However different complications may occur with use of these Double J stents. Short term placement complications like flank pain, haematuria, dysuria, frequency, Urinary Tract Infection (UTI) etc are quite common. Where these stents are left in place for long time, it results in significant morbidity like stent encrustations, stent fragmentation, recurrent UTI etc^{7,8}. Forgotten stent is frequently very complicated and poses a management and legal dilemma. However endourological methods like cystolithotripsy (CLT), retrograde ureteroscopy with intracorporeal lithotripsy,

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percutaneous nephrolithotripsy (PCNL) can be used for retrieval of these encrusted stents. Occasionally, extracorporeal shock wave lithotripsy (ESWL) and open surgery may be needed⁹⁻¹³.

METHODS

Ten patients (seven women and three male all from rural places) with forgotten ureteral stents with severe encrustations presenting to our department of surgery between Jan 2013 and Nov 2015 were treated. Mean age of patient was 38.4 years (range 26-62 years) and average indwelling time of the stent was 2.8 years (1.5 – 5 years). All these stents were placed somewhere else except one patient who was treated in Kathmandu Medical College and Teaching Hospital and had gone abroad (Middle East) for job and had forgotten about the stent. Ignorance by the patient's level and improper counselling by the surgeon were the main reasons for retention of stents.

All patients were evaluated for stent encrustation and associated stone burden by plain X-ray Kidney Ureters and Bladder (KUB) and Intravenous Urography (IVU). There was no need for us to do Technetium (Tc) 99m Diethylenetriaminepentacetate (DTPA) scan. Treatment decisions were made depending on clinical and radiological findings. Before intervention, all patients had negative urine culture and antibiotic prophylaxis was given in all cases. Combined endourological procedures like PCNL, cystolithotripsy (CLT), retrograde ureteroscopy with intracorporeal pneumatic lithotripsy and even open ureterolithomy was done. Percutaneous nephrolithotomy was performed using 20 Fr nephroscope and ureteroscopy was done with 8/9.8 Fr semi rigid ureteroscope. In case of large encrustation around loop in pelvis of kidney and fragmented loop in urinary bladder, cystolithotripsy was first done in lithotomy position and then standard PCNL in prone position and fragmented upper coil removed.

RESULTS

The patient characteristics, indications for stenting, indwelling time, site of encrustation, procedure performed, and duration of hospital stay were all noted. Majority of patients had undergone stone surgery and one patient had undergone open pyeloplasty for PUJ stenosis.

In four patients, body and lower coil had encrustations. In one patient, stent was fractured, the proximal coil having large encrustation and the distal coil in urinary

bladder also having large encrustation. In another two patients, encrustations were seen both in renal pelvis and in urinary bladder. In two patients, stents were fractured, all portions were in bladder with significant encrustations. In one patient knotting of stent was seen in mid ureter where endourological management failed and the stent was removed by open ureterolithotomy. The patient with large encrustation both in pelvis and urinary bladder underwent PCNL and CLT. Two other patients first underwent ESWL for two sessions and then CLT and stents were removed successfully. The remaining patients were treated with CLT and ureteroscopy. All the stents were removed under C-arm fluoroscopy guidance.

DISCUSSION

Forgotten ureteral stents are seen in urologic practice because of ignorance of patients or failure of physician to counsel the patients¹⁴. The available literature shows that Double J stents had been missed for a maximum of 23 years¹⁵.

The presentation of forgotten stents varies. They can produce considerable morbidity due to extensive encrustations, knot formation, fragmentation and proximal migration¹⁶. Damiano et al observed flank pain in 25.3%, encrustation in 21.6%, irritative bladder symptoms in 18.8%, haematuria in 18.1%, fever more than 104° Fahrenheit in 12.3% and stent migration in 9.5% of patients¹⁷. In our study, irritative voiding symptoms and haematuria were the predominant presentation.

Encrustation of forgotten stents with large stone burden is a serious problem due to complications like recurrent urinary tract infection, haematuria, obstruction and renal failure¹⁸. The deposition of encrusted material on retained ureteral stents can occur both in sterile and infected urine¹⁹. Common risk factors for encrustation include indwelling time, urinary sepsis, history of recurrent stone disease, metabolic predisposition to stone diseases, chemotherapy, pregnancy and congenital renal anomalies²⁰.

Fragmentation is another important complication and is due to loss of tensile strength. It also depends on the type of material of stents. Silicon was found to be least prone to encrustation followed by polyurethane, silitek, percuflex and hydrogele coated polyurethane. Fragmentation of polyurethane stents is four times as frequent as the silicon stents^{21,22}.

Table 1: Indication of stenting, site of encrustation, indwelling time and procedure performed.

No of patients	Indications of stenting	Site of encrustation	Indwelling time (Years)	Procedure performed*
3	Open pyelo- lithotomy	Vesical +renal pelvis	1 ½ -3	CLT, ESWL+PCNL
4	URSL	Vesical+ body part	2-3	CLT+URSL
1	Ureterolithotomy	Vesical	3 ½	CLT
1	Pyeloplasty	Vesical		CLT
1	URSL	Knotting of stent	2.5	Open ureterolithotomy

*cystolithotripsy (CLT), extracorporeal shockwave lithotripsy (ESWL), percutaneous nephrolithotomy (PCNL), ureteric lithotripsy (URSL)



Figure 1: Forgotten fractured ureteral stent with knotting in ureter and another fragmented portion in urinary bladder with large encrustation.

Forgotten ureteral stent with encrustation is a challenge and may require multimodal endourological approaches, even open surgery. Extracorporeal shock wave lithotripsy is the initial treatment for stents with minimal encrustation²³. In our study, ESWL was needed in two patients for two sessions for proximal loop encrustations

and CLT was done for distal loop encrustations. In one patient with large encrustations both in renal pelvis and bladder, stent was removed completely by percutaneous nephrolithotomy and CLT. In rest of the patients stents were removed by CLT and ureteroscopic lithotripsy except in one patient where the knotted stent was removed by open ureterolithotomy. Awad Kaabneh et al reported doing percutaneous nephrolithotomy in 8 patients and open ureterolithotomy in one patient out of 15 patients²⁴. In a study by Arora Sohrab et al, 5 patients underwent PCNL and one patient underwent ESWL in 12 patients with forgotten Double J stent¹⁵.

The mean number of procedures was 1.6 per patient that included 4 sessions of ESWL, 1 percutaneous, 7 cystoscopic, 3 ureteroscopic interventions and one open ureterolithotomy. It was 1.25 per patient in study by Arora Sohrab et.al¹⁵.

CONCLUSION

Although Double J ureteral stents have become an integral part of urological armamentarium, their use should be limited to those patients in which the benefits override possible complications. The combination of various endourological techniques and ESWL can achieve effective stent and stone treatment with minimal morbidities and hospital stay.

Maintenance of efficient "Stent register" log book under closed supervision of operating surgeon and proper counselling of patient is needed to prevent these complications. Treatment of all patients of urinary stone diseases with placement of Double J stent should be considered incomplete unless the stent is removed.

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