

## Case Series

# Fractured retained Double-J stents presenting as urethral foreign body

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## Abstract

Polyurethane Double-J ureteral stents are widely used in the field of urology. Postoperatively, patient education about the ureteral stent and making sure it is removed at the prescribed time is an utmost necessity. Forgotten ureteral stents are not only disastrous for the patient but also fraught with serious medico-legal implications for the urologist. The recent increase in usage of ureteral stents in the management of a variety of urinary tract disease processes mandates familiarity with these devices, their consequences, and their potential complications, which at times can be devastating. Here we presented 2 cases of retained fractured DJ stents which presented as perurethral foreign body.

## Key words

Double-J stent, Fractured, Urethra, Foreign body, Retained.

## Introduction

Ureteral stents represent the most mature application of an indwelling endoluminal splint, having first been described by Zimskind, et al. [1] in 1967. As originally described, the intent of implantation was for the treatment of ureteral obstruction or fistula. The indications for ureteral stent placement have expanded significantly. Ureteral stent placement is now considered a standard and indispensable urologic tool.

However, ureteric stenting is not without complications [2]. These stent related complications are primarily mechanical – stent migration, encrustation, stone formation and fragmentation which was elaborated in **Table - 1**. The stent acts as a foreign body causing urinary tract infection and pyonephrosis which may also lead to renal non-function [3].

**Table - 1:** Consequences and Complications of Ureteral Stent Placement [2]

- Irritative voiding symptoms
- Incontinence
- Suprapubic or flank pain
- Vesicorenal reflux
- Hematuria
- Pyuria
- Urinary tract infection
- Malposition
- Migration
- Inadequate relief of obstruction
- Encrustation
- Ureteral erosion or fistulisation
- Fracture
- Forgotten stent

Polyurethane, due to its low cost, high versatility and availability, is commonly used for ureteral stents. Since its introduction, complications had been encountered and resulted in significant morbidity. Pain, bladder irritative symptoms and fever are signs of early complications, late complications, such as encrustation, infections and fragmentation, are more troublesome [2, 4, 5]. Cases of fragmented ureteral stents are rare and are classified as grade 3 in the Clavien Classification of surgical complications [6]. Hence, it is mandatory that ureteral stent should be removed as early as possible after it has served its purpose to prevent complication and morbidity. We reported two female patients with broken retained DJ stents with encrustations and calcification which got fractured over time and presented as urethral foreign body, a complication of DJ stenting which hasn't been reported in literature till date

**Case series**

**Case - 1**

28 year old lady/ unmarried, presented with complaint of foreign body per urethra and severe LUTS of 4 days duration to a gynaecologist and was referred to our OPD with a diagnosis of foreign body per urethra. She underwent Right URSL + DJ stenting outside 4 years back for right ureteric calculus and was lost to follow up.

Her routine investigations and renal function were normal except for complete urine routine showed pus cells and epithelial cells, and culture was positive for E.Coli  $>10^5$  CFU. On examination encrusted fragment of DJ stent was protruding from urethra (**Figure - 1.1**).

**Figure - 1.1:** Picture showing fractured encrusted stent coming out per urethra.



**Figure - 1.2:** X-ray KUB showing fractured DJ stent coming out of urethra.





**Figure - 1.3:** Removed lower fragment and IVP showing normal excretions in both kidneys and dilated rt PCS with retained rt DJ stent with dense encrustations.



**Figure - 1.4:** Removed upper fragment with dense hard encrustations.



X-ray KUB and pelvis were taken which showed retained encrusted DJ stent which got fractured and protruding perurethra (**Figure - 1.2**). Immediately the lower fragment was removed under spinal anaesthesia which showed hard encrustations which had to be removed using pneumatic drill and laser. URS was attempted at the same sitting but couldn't be accomplished as there were many hard encrustations.

An IVP was done which showed dilated PCS with normal excretion, but open procedure was opted to remove the upper fragment due to hard encrustations and possibility of impaction to the ureteric wall, as incision of the ureter may be necessary (**Figure - 1.3, 1.4**). Post operatively again stenting was done and this time it was removed with due respect after 6 weeks.

## Case - 2

10 year old female child presented to OPD with a complaint of foreign body per urethra of 2 days duration. She underwent open ureterolithotomy and DJ stenting 5 years back by paediatric surgeon for lower ureteric calculus and was lost to follow up. On examination DJ stent was found coming out per urethra (**Figure - 2.1**).

**Figure - 2.1:** Picture showing fractured stent coming out per urethra.



**Figure - 2.2:** X-ray KUB showing fractured DJ stent coming out per urethra with encrustations and vesical calculus of size 3.5 cm, which was formed in the lower-J of the DJ stent and upper fragment in the renal pelvis.



**Figure - 2.3:** Removed part of the lower fragment.



**Figure - 2.4:** Encrusted lower fragment after removal of calculus and upper fragment.



Routine investigations were normal as were renal function tests, urine routine and culture was sterile. X-ray KUB showed fractured DJ stent with encrustations and vesical calculus which was formed in the lower-J of the DJ stent and upper fragment in the renal pelvis (**Figure – 2.2**).

Under general anaesthesia the lower fragment was removed by cystolithotripsy and upper fragment was removed using 4.5 Fr ureteroscope. IVP done after 6 weeks showed good excretion from both kidneys (**Figure – 2.3, 2.4**).

### **Discussion**

Forgotten ureteral stents are observed in urologic practice because of poor compliance or failure of the physician to adequately counsel the patient [7]. El-Faqih and colleagues demonstrated that the rate of complication for polyurethane stents indwelling for less than 6 weeks was 9.6%, whereas the rate increased to 47.5% for stents left for 6 to 12 weeks and even increased to 76.3% for stents left more than 12 weeks [8]. The findings were supported by Kumar and colleagues; they found that stents had fragmented into multiple pieces over a mean indwelling time of only 14 weeks [9]. A common characteristic of our two cases was the prolonged indwelling time of the stents, with an indwelling time of 48 weeks and 60 weeks respectively. When the stent is exposed to different factors in the urine and the urothelium for a long time, it may lead to loss of strength, elasticity and flexibility of the stent [10]; the degradation of stent polymers leads to loss of tensile strength and hardening of the stent. The optimal indwelling period is 8 to 16 weeks depending on stent material [4, 8].

As a complication, nowhere till date stent presenting as urethral foreign body was mentioned in literature.

Encrustations of the ureteral stents are associated with urinary infection [11]. Encrustations are often composed of calcium oxalate which is enhanced by rough surfaces, catheter holes and edges (major characteristics of polyurethane

stents) [12]. Singh and colleagues noted that the most dense and thickened encrustations were seen in the upper curl with minimal encrustation in the lower curl, which may be due to the effective peristalsis in the lower and intramural part of the stent [13]. Due to the encrustations, both ends of the stent were retained in situ and the central shaft may be degraded and vanished due to hostile urine environment cause by infections [14]. In our case first patient had UTI and dense hard encrustations and got fractured in the mid ureter where as in second patient culture was sterile and stent was free from encrustations except for lower J limb which was incorporated in vesical calculus probably due to prolonged urinary stasis which caused fracture of the stent at the upper end.

Generally, transurethral intervention is enough to remove the bladder stents; this was applied to our cases and lower fragment could be retrieved using cystoscopy, pneumatic drill and laser, but retrieval of proximal ureteral stent fragment was technically challenging and equally frustrating. In previous reports, ureterorenoscopy and percutaneous procedures were used to remove fractured stents in the renal pelvis, while midureteral stent fragments can be removed using a stone basket under fluoroscopic guidance. Sometimes we will left with no option but to remove by open procedure because of stone burden as saving the function of kidney is of at most priority. In first case open technique was opted as ureterorenoscopic retrieval couldn't be done due to dense encrustations and impaction to the ureteric wall and in second case retrieval was done by endourological techniques.

## Conclusion

Retained DJ stents can cause mild to severe complications leading to psychological, financial and physical trauma both on the patient and treating clinician. With growing awareness in medico-legal issues, the best way to handle them is by preventing them. So many tools are available in the present day to keep in track with our patients, so appropriate registries or

computer based registry must be followed. Combined endourologic techniques can achieve successful and safe management of forgotten stents, but treatment should be tailored to the volume of encrustation and associated stone burden.

Another main element of the treatment strategy is to keep the number of interventions as low as possible because by the application of these increased modalities, financial burden and labour loss increase and impaired quality of life brought must not be forgotten.

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