Endourology
A neglected double J ureteral stent for 10 years: A rare case report
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ABSTRACT
Complications of Double J stenting (DJS) include migration, fragmentation, and encrustation. In addition, forgotten stents with encrustations and stone formations are difficult to remove.
We report the case of a stent “forgotten” for 10 years, concomitant with multiple ureteral stones and bladder calculus. Whole encrustation of the stent was observed. The patient underwent cystolithotripsy, ureteroscopic laser lithotripsy and stent removal. We report the longest period of forgotten DJS with maximum stone burden in the urinary system. To avoid this situation, patients should be educated regarding complications if the stent is not removed within a short period.

Introduction
Double J stents (DJS) are normally used in the treatment of obstructive anuria, ureteral reconstructive surgery, before extracorporeal shock-wave lithotripsy (SWL), and obstructive uropathy. However, in addition, a forgotten stent may be complex and challenging at the time of removal. Herein, we report a case of a forgotten DJS for 10 years that was complicated due to massive stone burden.

Case presentation
A 49-year-old male patient presented to our out-patient department with intermittent right flank ache and burning micturition from the past one month. Abdominal and pelvic ultrasonography (US-KUB) revealed moderate hydronephrosis at the right side and bladder calculus. X-ray KUB [Fig. 1] revealed a DJS forgotten for 10 years post ureteric stone treatment. The whole stent was covered with a thick layer of encrustation with multiple stones formation. Multiple radio-opaque shadows were observed: 27 mm × 10 mm calculus inside the proximal ureter, a 32 mm × 11 mm calculus at the level of sacroiliac joint, and 22 mm × 12 mm calculus at the level of the pelvic ureter. A 42 mm × 22 mm calculus was visible in the urinary bladder. The total stone burden in the ureter was 81 mm, and the stone bladder was 42 mm (Overall stone burden 123 mm). These findings were confirmed using CT KUB scan.
Preoperative laboratory examinations revealed a total leucocyte count of 12,000 per cu mm. Urine microscopy revealed plenty of pus cells and RBCs. The levels of serum creatinine (132 Lmol/L), uric acid (484 Lmol/L), and serum calcium ([2.9 mmol/L) were found to be elevated.
In this case, we decided to endorse cystolithotripsy with Holmium YAG laser for the bladder calculus and semirigid/flexible ureteroscopy with Holmium YAG laser lithotripsy for ureteral stones and encrusted stent.

Operative procedure
First session
Briefly, under general anesthesia, the bladder calculus [Fig. 2A] was fragmented by cystourethroscopy and Holmium YAG laser Lithotripsy, and the gravels were eliminated using Ellik evacuator. Then, semi-rigid ureteroscope 6–7.5 F was used for diagnostic/therapeutic ureteroscopy (URS), a 0.64-mm straight tip Terumo guidewire was smoothly placed in the kidney, and a 0.89-mm straight tip Roadrunner guidewire (Cook Urological Inc., USA) was inserted. The lower ureter stones and encrustations over the lower part of the stent were removed by Semi-rigid Ureteroscopic Holmium YAG Laser lithotripsy (Richard Wolf Medical Instruments Corp., USA).

Second session
This session pertained to the management of proximal ureteric stones two weeks after the first session [Fig. 2B]. In brief, with the help of a semi-rigid ureteroscope, a 0.64-mm straight tip Terumo guidewire was
smoothly placed inside the kidney, and a 0.89-mm straight tip RoadRunner guidewire was inserted. The flexible ureteroscope (Richard Wolf Medical Instruments Corp., USA) has outer and tip diameters of 9.9 F and 6 F, respectively. The Ho: YAG laser was inserted (200–272 μm fiber, Mega pulse stone laser, Richard Wolf Medical Instruments Corp.) for fragmentation. The middle and proximal ureteral stones were cleared, and encrustation over the middle and upper part of the stent was eliminated within the second session [Fig. 3]. The final plain X-ray demonstrated new DJS within the right accumulation system with stone fragments or residual DJS fragment diagnosed. After the procedure, the patient was asymptomatic and currently remains so. Postoperative stone evaluation revealed the stone composition to include calcium oxalates monohydrates, dehydrates and Calcium phosphates. Stent swab culture revealed infection by Burkholderia Spp.

Discussion

Ureteral stents are frequently utilized in urologic practices. Stent composition and design have undergone many improvements but are still associated with morbidity in approximately 80% of cases.  

Monga et al., 4 reported 22 patients with “forgotten” stents for more than 6 months. Complications were reported as migration by 40.9% patients, calcified stents by 68% patients, fragmented stents by 45.5%, and fragmented with calcification by 13.6%. Aboutaleb et al., 5 reported histopathological changes inside the urinary bladder because of the temporary presence of DJS. Cystitis cystica, Brunn’s nests, and cystitis glandularis were observed frequently in patients who had stents lasting more than 12 weeks.

To our knowledge, this current study reports the longest duration of a “forgotten” stent, which was inserted 10 years ago, with the highest stone burden and neglected DJS reported in the literature. Moreover, the “forgotten” stent migrated down to the proximal ureter, inflicting obstruction and moderate hydronephrosis. Stent migration, fragmentation, and encrustation are the most common complications associated with forgotten DJS. In our report, we found that the patient had hypercalcemia and hyperuricemia with alkaline urine. Encrustation of DJS is often associated with alkaline urine and urinary tract infection, and struvite and calcium phosphate deposits.

Management of complicated DJS

The uses of the latest modern endourologic lithotripsy techniques are required. Combined surgical procedures or staged procedures are also required, especially in complicated cases. Shock wave lithotripsy, ureteroscopic laser lithotripsy, and percutaneous nephrolithotomy are the most frequently used techniques. Due to the location of the stent in our patient, it was easy to retrieve the stent completely using a retrograde ureteroscopic procedure.

Prevention of stent complications

Numerous measures are recommended to prevent DJS complications. Optimum length and placement of stents should minimize stent migration. Timely cystoscopic replacement needs to be done to minimize calcification and fragmentation when the stent is indicated for a long time. Earlier replacement may be required in patients with stones or during pregnancy. Prophylactic antibiotic therapy may decrease infected stone encrustation. In our case, the “forgotten” stent was because the patient was not aware about its for 10 years. To prevent this situation, patients should be reminded of the presence of an internal

![Fig. 1. X-Ray Kidney-Ureter-Bladder Revealed a forgotten Double J stent for 10 years with bladder calculus formed in the lower coil and multiple stones in the ureter with upper coil in the proximal ureter.](image1)

![Fig. 2. [2A]: Endoscopic view of bladder calculus is formed in the lower coil of the forgotten double J stent for 10 years. [2B] Endoscopic view of the forgotten double J stent with thick layers of encrustation around the stent during removal by holmium YAG laser.](image2)
stent that could lead to problems if left inside for more than 3 months. Moreover, a computerized registry of stent placement may be used to alert the urologist when the stent must be removed.

Conclusion

We report the longest duration of forgotten DJS with highest stone burden in urinary system. To prevent this situation, patients should be educated for stent. Moreover, a computerized registry of stent placement may be used to alert the urologist when the stent must be removed.

Author contributions

HA wrote the manuscript, performed the operation, and managed the patient’s perioperative course. HA gave the final approval of this manuscript. HA read and approved the final manuscript.

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Ethics approval and consent to participate

All procedures performed in this study were in accordance with the ethical standards of the Institution and/or National Research Committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Declaration of competing interest

The authors declare that they have no competing interests.

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References

1. Aboutaleb HA, Ali TA, Gawish M, Omar ME. Fluoroscopy-free double-J stent placement through ureteroscope working channel post uncomplicated ureteroscopic laser lithotripsy: a novel technique. Urol Ann. 2019;11(1):39-45. https://doi.org/10.4103/UA.UA_59_18.
2. Joshi HB, Okeke A, Newns N, Keeley Jr FX, Timoney AG. Characterization of urinary symptoms in patients with ureteral stents. Urology. 2002;59(4):511–516. https://doi.org/10.1016/s0090-4295(01)01644-2.
3. Andriole GL, Bettmann MA, Garnick MB, Richie JP. Indwelling Double-J ureteral stents for temporary and permanent urinary drainage: experience with 87 patients. J Urol. 1984;131:239–241.
4. Monga M, Klein E, Castañeda-Zúñiga WR, Thomas R. The forgotten indwelling ureteral stent: a urological dilemma. J Urol. 1995;153(6):1817–1819.
5. Aboutaleb H, Gawish M. Correlation of bladder histopathologic changes due to double-J stenting to the period of stenting: a preliminary study. J Endourol. 2017;31(7):705–710. https://doi.org/10.1089/end.2017.0113. Epub 2017 May 31.

Fig. 3. Picture shows the removed forgotten double J stent with peeled outer layer and multiple stone gravels.