Case Report

Double-J stents forgotten for four years: a case report

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pISSN: 0853-1773 • eISSN: 2252-8083
https://doi.org/10.13181/mji.v28i3.3132
Med J Indones. 2019;28:280–3

Received: October 14, 2018
Accepted: June 11, 2019

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ABSTRACT
Placement of double-J ureteral stents after endourologic procedures and some open urological surgeries are practical and safe. However, when neglected *in situ*, undesired problems may occur, leading to serious medical and legal issues. Complications from ureteral stents with protracted indwelling durations include urosepsis, renal failure, encrustation, and spontaneous fractures which may be retained or voided in the urine (stenturia). We report a 40-year-old woman of forgotten double-J ureteral stents, inserted 4 years prior to this study during a gynecologic operation. The patient had pulled out the double-J stents from her urethra herself and presented with impending sepsis. Then, she underwent ureterorenoscopic lithotripsy, but it failed to remove the remaining encrusted double-J stent. As a result, percutaneous nephrolithotomy was performed successfully and she had symptom-free thereafter.

KEYWORDS neglected stent, ureteral catheters, ureterorenoscopy

Ureteral stents are usually inserted to prevent and release ureteral obstruction caused by various etiologies. Ureteral obstruction may be caused by obstructive ureteric calculi, ureteral strictures, congenital anomalies (obstruction of the ureteropelvic junction), fibrosis, or retroperitoneal tumors. Ureteric stents are also used to help identify the ureters and prevent injury before open surgeries, urological laparoscopy, and non-urological procedures.[1,2] Indwelling ureteral catheters are used extensively. However, when neglected or forgotten *in situ* for an extended duration, a number of complications can occurs such as migration, infection, pyelonephritis, breakage, encrustation, fragmentation, and formation of stones.[3] Both the treatment for and the displacement of forgotten stents depend on the severity of the encrustation and features of the stones in the stent region. There is a range of treatment options including extracorporeal shock wave lithotripsy (ESWL), laparoscopy, and open surgery.[4] ESWL, as well as percutaneous and endoscopic stone techniques have positively impacted urolithiasis management significantly.[4] This study reported a case of spontaneous discharge of a ureteral stent fragmentation.

Case report

A 40-year-old woman presented to our out-patient clinic with part of the double-J ureteral stent that she pulled from her urethra 3 days before the visit

Figure 1. Encrusted double-J stent removed by the patient

(Figure 1). An informed consent letter by the patient was documented which stated an agreement and no objection to the publication of her case for scientific and educational purposes. One month after, she had a history of right flank pain, dysuria, and hematuria. About 4 years before the visit to the clinic, she had a surgical procedure to remove a giant uterine myoma, and double-J ureteral stents were inserted for ureteral preservation to her left and right ureter. She forgot that she had double-J stents, until it came out from her urethra.

She had a fever. Otherwise, her physical examination was unremarkable. On investigation, she had leukocytosis and leukocyturia. A kidney, ureter, and bladder X-ray showed a left double-J stent, with a coil of the double-J stent fragmented *in situ* in the right kidney (Figure 2).

The patient was hospitalized and received antibiotic treatment (Ceftriaxone 2 gr q.d. intravenously). The patient underwent endoscopic removal of the double-J stents under spinal anesthesia. The left double-J stent was removed under ureterorenoscopy (URS) with a lithoclast to fragment the encrustations (Figure 3). Right URS showed an encrusted double-J stent (Figure 4). The remaining fragment could not be removed via URS. Therefore, the patient underwent successful percutaneous nephrolithotomy (PCNL) to remove the remaining fragment of the right double-J stent. Bilateral 4.7 Fr ureteric catheters were placed for 2 months.

No serious complications were observed in both the preoperative and postoperative periods. The patient was discharged on postoperative day 3. She is asymptomatic and in good condition on follow-up for 1 month.

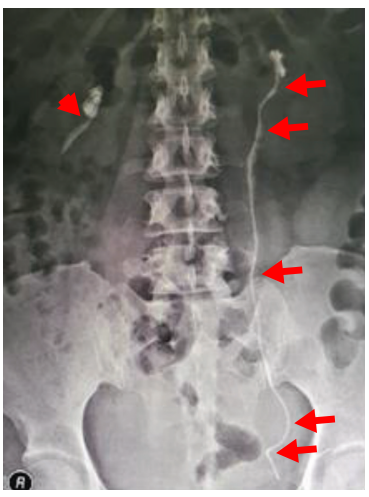

Figure 2. X-ray showed a coil of fragmented double-J stent (arrow) in the right ureter and a complete double-J stent (arrowhead) on the left ureter

DISCUSSION

A stable ureteric stent is an integral part of urologic practice, and it is a simple, safe, and cost-effective way to improve or restore the drainage from the kidney to the bladder. Since the introduction of the stent in 1978, several improvements have been made to the composition and design of stents. However, complications are still common.[1,5] Short-term (4–12 weeks) complications include frequency, dysuria, hematuria (stent syndrome), urinary tract infections, and flank pain. Long term (3–6 months) complications include blockage, migration, fragmentation, encrustation, and hydronephrosis.[2,6] Generally, both ends of a stent are looped to enhance retention. However, migration may still occur due to ureteral peristalsis, poor placement, or stent design. Stent migration usually occurs in the upward direction.[7]

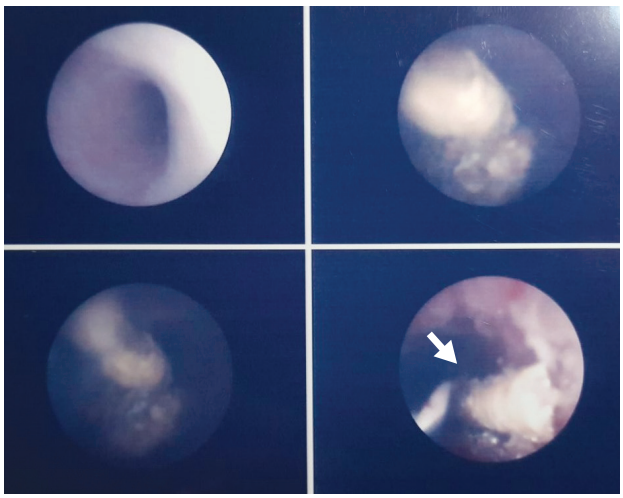

Figure 3. Ureterorenoscopy of right ureter and renal, arrow showing a fragmented double-J stent

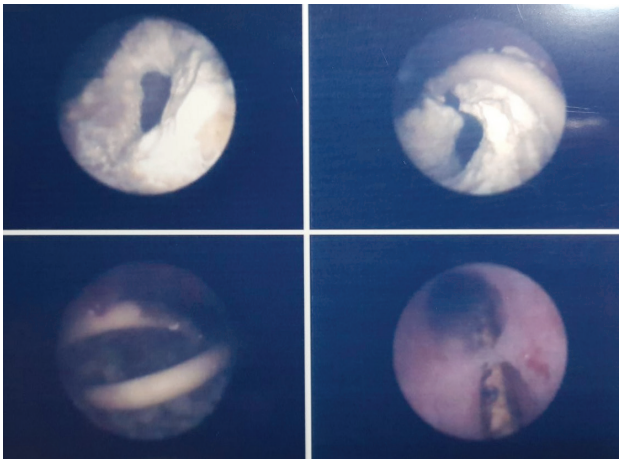

Figure 4. Ureterorenoscopy showing left double-J stent with encrustation

In this patient, the double-J ureteral stent migrated downward into the urethral meatus. Stenturia, a spontaneous fragmentation of the stent, followed by excretion of fragments in urine is extremely rare.[8] Fragmentation is associated with protracted indwelling times, during which stents lose tensile strength and cracks emerge, resulting in fracture of the stents. Zisman et al in Ray et al,[9] concluded that fragmentation is due to an accelerated aging of the stent material.

Complications from forgotten ureteric stents are challenging for urologists. They can occur due to poor patient compliance with instructions for stent removal, inadequate counseling from practitioners, or an absence of general guidelines for managing this potentially serious problem.[3] The management strategy should include thorough preoperative radiological imaging to assess the size of the stone and sites of encrustations. A non-contrast computed tomography scan increases the accuracy of predicting the stone burden associated with an encrusted ureteral stent.[3,6,10] The condition of the affected kidney, documented by a renal scan, also helps determine the endourological procedure of choice.[4,10] The management of ureteral stents depends on the site of encrustation, the stone burden, and the condition of the affected kidney.[2,10] Depending on the severity of the encrustations, procedures such as ESWL, PCNL, URS lithotripsy, and open surgeries are either performed alone or in combination with other procedures.[11] Due to advances in the development of surgical devices, stent retrieval is now primarily done using endourologic techniques. However, stent removal must be performed by well- trained and experienced urologists. In the absence of the appropriate facilities, or if other techniques cannot be carried out, open surgery is an alternative.[5] Management of an encrusted double-J stent is very challenging, as there are no guidelines for treatment best practices.[5] In this case, the double-J stent was removed endoscopically under spinal anesthesia. Initially, it was planned to eliminate the fragmented stent in the renal pelvis and midureter by endoscopic intervention. URS and lithotripsy using a rigid ureteroscope alone could not remove the fragmented stent close to the stone lining in the proximal ureter, because the stone was too hard and covered the double-J stent in the pyelum. Therefore, it was decided to perform PCNL.

The duration of an indwelling double-J stent should be as short as possible, with a replacement double-J stent inserted when a longer duration of stenting is required. Using sonography for careful monitoring of the patient every 2 months can help limit the possibility of a forgotten stent left *in situ*.[5] In this study, the stent was "forgotten" because the patient did not return for routine clinical examinations. In order to prevent this, patients must be reminded of the need to have the stent removed at the appropriate time. If necessary, patients must be given a schedule for stent removal. A complete record of stent disposal must be detailed in the patient data. To help identification, the nurse and treating surgeon must regularly update the stent registration information. For indwelling stents with a protracted duration, removal appointments must be scheduled immediately.[5] A kidney, ureter, and bladder X-ray should be performed, if it is not contraindicated. This provides the patient a visual reminder of the presence of stents *in situ*, potentially improving the chances of their timely removal.[2] The timely removal of indwelling stents is essential to reducing morbidity and preventing legal complications for physicians.

Conclusions

The double-J stent is widely used in various urological procedures. Double-J ureteral stents are still forgotten or neglected *in situ.* Therefore, this remains a challenge for physicians and clinical staff. This case report should remind urologists and health professionals to be more attentive to ensuring it does not happen. It must be noted that excessive encrustation is likely in the presentation of a forgotten double-J stent case. Minimally invasive endoscopic techniques can remove most retained and encrusted ureteral stents. Proper patient education and awareness about indwelling stents is

key to preventing such complications. Maintenance of a stent register and a proper follow up system is the most preferred approach to avoiding a forgotten stent scenario.

Conflict of Interest

The authors affirm no conflict of interest in this study.

Acknowledgment

None.

Funding Sources

None.

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