Ileal Ureteral Substitution After “Panureteral Damage: A Devastating Complication of Forgotten Double-J Stent”

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Abstract

Background: Forgotten ureteral stent is frequently observed in urologic practice. It has serious consequences such as encrustation, stone formation, fragmentation, ureteral damage, and sepsis. Panureteral damage by forgotten stent is a major complication requiring complex reconstructive surgery.

Case Presentation: We report a case of 66-year-old man with forgotten ureteral stent for 10 years, which caused panureteral damage. Ileal ureteral substitution was done and kidney was salvaged.

Conclusion: Prolonged forgotten stent can cause panureteral fibrosis and requires complex surgical procedure such as ileal ureteral substitution.

Keywords: forgotten stent, Double-J stent, ileal ureter substitution, ureteral stricture, appendix interposition, ureter substitution by buccal mucosa graft

Introduction and Background

URETERAL STENT IS commonly used in the management of urolithiasis. Most surgeons put a stent in the ureter after ureterolithotripsy and it is removed after 2–12 weeks. Stent is a foreign substance in the body and it must be removed when its purpose is fulfilled. If its removal is missed, it can cause serious complications such as encrustation, fragmentation, migration, irreparable ureteral damage, and urosepsis. Management of these complications depends upon individual cases. Herein we present a case of forgotten Double-J stent for 10 years with complete ureteral damage, which was managed by ileal ureteral substitution.

Presentation of Case

A 66-year-old man, with chronic obstructive pulmonary disease, who had undergone right ureterolithotripsy 10 years back presented with features of sepsis. On evaluation, he was found to have right Double-J stent, fragmented into multiple pieces with right pyonephrosis and acute renal failure. The patient was initially managed by percutaneous nephrostomy and antibiotics. He also required ventilator and inotropic support. Once he recovered from sepsis, a complete evaluation of extent of ureteral damage and renal function was done by CT scan, nephrostogram (Fig. 1), endoscopy, and renal nuclear scan. Renal function was good with 24-hour urine

production of 850 mL from the affected kidney and split renal function was 36%. An attempt to remove the stent was done by endoscopic combined intrarenal surgery. The fragmented portion of stent in the renal pelvis and bladder was removed, but multiple broken parts were entrapped in the ureter.

Pelviureteral junction and right ureteral orifice was completely obliterated. Subsequently, fibrosed ureter encompassing the fragmented stent was excised and an ilealureteral substitution was done. A 20 cm ileal segment, 15 cm proximal to ileocecal junction was chosen for this substitution. Postoperatively the patient is doing well (Fig. 2).

Discussion and Literature Review

A forgotten stent for a long period can have encrustation, fragmentation, migration, entrapment in the ureter with extensive ureteral damage, and urosepsis. A complete evaluation by CT scan is essential for proper individualized management. Most common complication of forgotten stent is encrustation and stone formation. It can be managed by a combination of percutaneous nephrolithotomy, ureteroscopy with laser lithotripsy, cystolitholapexy, and extracorporeal shockwave lithotripsy depending on the location and severity of encrustation. Inflammatory reaction by body to these stent may cause extensive ureteral damage. Here in our case, the stent got fragmented and complete ureter was damaged with development of pyonephrosis and urosepsis. Once his

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FIG. 1. Nephrostogram showing completely blocked pelviureteral junction and fragmented ureteral stent.

FIG. 2. Nephrostogram after ileal ureteral substitution.

pyonephrosis and urosepsis were managed, a complete evaluation of his damaged ureter was done. There was panureteral fibrosis. Management of ureteral loss depends upon location and its length. Various alternatives available for the management of complex long segment ureteral strictures include Boari flap reconstructions (12–15 cm stricture length), auto transplantation, ileal substitution or appendiceal interposition, and buccal mucosal augmentation of ureter. Boari flap is mainly suitable for distal and mid ureteral strictures and depends on bladder capacity but may not be able to reach the proximal ureter. Auto transplantation usually used as last resort when reconstruction of ureter is not feasible. It is technically challenging as well and may lead to long-term vascular complications. In literature there are anecdotal reports of using novel methods of ureteral reconstruction using buccal mucosa graft and appendiceal interposition. For reconstruction of ureter using buccal mucosa, incision is given on narrowed segment of the ureter and buccal mucosa graft is sutured until the graft completely covers the ureter. An omental flap is wrapped and sutured to the graft to provide vascularity.¹

In appendiceal interposition, an end-to-end anastomosis is done with both ends of ureter after excising stricture segment, but it carries significant risk of stricture recurrence at anastomotic site. Appendix has smaller luminal diameter that decreases the risk of systemic acidosis by decreasing the mucosal surface area available for metabolite absorption and limiting urinary stasis.² This technique carries significant risk of stricture recurrence at anastomotic site and is not possible in patients who had previously undergone an appendectomy. Furthermore, the length and caliber of appendix may be insufficient to repair the ureteral stricture defect.

In a large series study on the use of ileum for ureteral reconstruction, Sandra et al. found that the most common reason (68.1%) for performing this procedure was radiation-induced stricture or iatrogenic ureteral injury.³ This is probably the first case of ileal ureteral substitution after panureter loss caused by a forgotten Double-J stent. Fibrosed ureter encompassing the fragmented stent was excised and an ileal ureteral substitution was done. A 20 cm ileal segment, 15 cm proximal to ileocecal junction was chosen for this substitution.

Most common short- and long-term complication of ileal ureteral substitution is urinary tract infection. Metabolic derangements are infrequently observed because the intestinal segment works only as conduit of urine from kidney to bladder and urine remain in contact with intestinal epithelium only transiently. Moreover, the possibility of metabolic abnormality is minimal if contralateral kidney is healthy. Boxer et al. has found that renal function remained stable in 74.7% of patients of ileal ureter substitution.⁴ On 6 months follow-up; our patient is doing well. It is evident that a forgotten ureteral stent can not only necessitate a complex surgery but also threaten the life of the patient. Therefore, every attempt should be made for timely removal of stent. Several measures have been advised by different authors such as maintaining stent registry and smartphone-based stent tracking system.

Conclusion

Forgotten ureteral stent in body for prolonged period may result in serious consequences with considerable morbidity and even threat to life. Every measure should be done by the treating surgeon to prevent this rare complication by proper

patient counseling, maintaining stent registry, and use of smartphone-based apps for timely stent removal.

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Abbreviation Used

CT = computed tomography

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