Reminder of important clinical lesson

Forgotten stent leading to complex panurinary stone: single-sitting endourologic management

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Summary

A case of forgotten and fragmented JJ ureteral stent with significant complex, panurinary stone bulk (stone in kidney, ureter and bladder) was managed in a single sitting using mechanical lithotrite for bladder and ureteral components and percutaneous nephrolithotripsy for the renal component.

BACKGROUND

Urinary JJ stents are not free of complications such as malposition, migration, extrusion, urinary tract infection (UTI), urinary incontinence, fragmentation, encrustation and stone formation.¹ The treatment algorithm of stent-related stone disease is not clear and is considered difficult. Herein, we report a case of retained broken stent along with significant stone burden present in the kidney, ureter

and bladder, and its endourological management using conventional endourologic techniques.

CASE PRESENTATION

A 27-year-old man presented with right-flank pain and recurrent UTI for 6 months. He had undergone right nephrolithotomy followed by JJ stent placement 9 years previously, and, subsequently, was lost to follow-up. Physical

Figure 1 X-ray of the kidney, ureter and bladder shows a retained broken JJ stent with significant stone bulk in the kidney, lower ureter and urinary bladder.

Figure 2 Three-dimensional CT urogram shows normal excreting left kidney and right hydronephrosis with a fragmented, calcified JJ stent along with a right-renal calculus on the renal coil, a vesical calculus on the vesical coil and right lower ureteral stone.

examination was unremarkable except mild right-flank tenderness and previous surgical scar mark.

INVESTIGATIONS

His haematologic and biochemical investigations were unremarkable. Urinalysis revealed microhaematuria and pyuria, while urine culture was positive for *Proteus mirabilis*. X-ray of the abdomen showed a broken JJ stent with significant stone bulk in the kidney, lower ureter and urinary bladder (figure 1). Three-dimensional CT urogram revealed similar findings (normal left kidney and right hydroureteronephrosis with a fragmented, calcified JJ stent along with a right-renal calculus on the renal coil, a vesical calculus on the vesical coil and right lower ureteral stone) (figure 2).

TREATMENT

In view of significant stone bulk, he was counselled for staged endourologic management. After a sterile urine culture, the bladder stone was crushed with a mechanical lithotrite under general anaesthesia. After complete bladder stone removal, entry into the ureter was made with semirigid ureteroscope with difficulty because the orifice was obscured in trigonal oedema. However, once we gained entry, subsequent movement into the ureter was easy as the ureter was dilated. The lower ureteral stones were not seen in the lower ureter and we thought that they must have migrated into the upper ureter. But to our surprise we realised that the lower ureteral stone bulk had been removed at the time of bladder stone removal. After placement of ureteral catheter, the patient was positioned prone and percutaneous nephrolithotripsy was performed in the same sitting achieving complete stone clearance.

OUTCOME AND FOLLOW-UP

Postoperative period was uneventful and the patient is asymptomatic at 6 months follow-up.

DISCUSSION

Although the exact aetiology of encrustation is unclear, the incidence of encrustation increases with indwelling stent duration. In one study, encrustation rate increased from 9.2% before 6 weeks to 76.3% after 12 weeks.¹ Risk factors for stent encrustation are poor patient compliance to follow-up, long indwelling times, sepsis, pyelonephritis, chronic renal failure, recurrent or residual stones, lithogenic history, metabolic abnormalities such as hypercalciuria, hyperuricosuria and hypocitrauria, congenital renal anomalies and malignant ureteral obstruction with associated chemotherapy and hyperuricosuria.²

The exact interval for changing or removing an indwelling ureteral stent to avoid encrustation is controversial. The optimum interval is usually 2–4 months but should be sooner in patients with risk factors.¹ In the absence of

UTI, Robert *et al*³ found that calcium oxalate is the major component of stent encrustation with calcium ammonium phosphate and calcium phosphate also present in smaller quantities. Ideal ureteral stent biomaterial or design has not been discovered. However, one development is that of drug (triclosan) eluting stents, which can possibly prevent infection, encrustation and even stent-related symptoms.⁴

Removal of a severely encrusted or fragmented JJ stent is a difficult management problem for endourologists.¹ The management of such stents needs judicious combination of multimodal endourologic techniques and shock wave lithotripsy in one or multiple settings.⁴ In view of significant stone bulk, we were also expecting the same. However, to our surprise, the ureteral stone bulk got pulled inside the bladder inadvertently (but to our advantage) at the time of bladder stone fragmentation. This probably happened because the bladder and ureteral components were joined to each other and also because of the pulling movement exerted on the stone each time the stone was crushed in the instrument.

Learning points

- This phenomenon of inadvertent pulling of ureteral stone bulk inside the bladder at the time of bladder stone fragmentation may not have happened had laser energy been used for fragmentation.
- This case highlights one of the various clinical scenarios that can arise in the management of these unusual cases.
- This case also, once again, emphasises the importance of patient education and close follow-up when placing indwelling ureteral stents.
- Reliable methods, such as electronic stent register and stent extraction reminder facility for tracking stents, may provide effective solutions to this preventable complication.⁵

Competing interests None.

Patient consent Obtained.

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