1110-5704
African Journal of Urology

Vol. 11, No. 3, 2005
247-249

STONES ON A FORGOTTEN DOUBLE-J STENT: A CASE REPORT OF MULTIPLE STONES CASTING A MULTI-FRACTURED URETERAL STENT

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INTRODUCTION

The double-J ureteric stent has become one of the most basic and valuable tools in urology. It is employed in the upper urinary tract for restitution or maintenance of urinary drainage, in malignant ureteral stenosis and obstructive uropathy in high risk-patients.[1]

In addition, double-J (DJ) stents are used as an adjuvant measure prior to ESWL for large kidney stones to reduce complications and contribute to a successful stone passage.[2,3]

We herein report a case of stone formation on a DJ stent that had not been removed after completion of stone disintegration.

CASE REPORT

A 61-year-old male was admitted to our department because of left loin pain and dysuria. He had undergone left DJ stent placement prior to extracorporeal shock wave lithotripsy (ESWL) on a left renal stone four years earlier. The DJ stent had not been removed after completion of stone disintegration.

Serum creatinine was 2.0 mg/dl (N: 0.4-1.4 mg/dl) and urinary tract infection caused by pseudomonas was present. Abdominal and pelvic ultrasonography revealed multiple bilateral renal stones, left hydronephrosis, a stone in the left upper ureter, and a huge bladder stone. Plain abdominal X-ray revealed a multi-fractured left ureteric DJ stent in a good position with one end in the upper renal calyx and the other end in the urinary bladder with stones casting the stent from the kidney down to the bladder. Also, multiple stones in the region of the left lower calyx and right kidney were apparent (Fig. 1A).

Gentamycin and Piperacillin were administered before the operation to eradicate the infection.

A left renal standard flank incision was made to clear the kidney and the upper ureter. Since there was a large stone burden casting the stent as well as multiple calyceal stones, the renal pelvic stone casting the upper tip of the fragmented stent was removed separately through a pyelotomy incision, followed by removal of the calyceal stones through separate upper and lower nephrotomy incisions. An upper ureterotomy incision was then carried out to remove the part of the calcified stent in the upper ureter down to the middle ureter. A subumbilical midline incision was made through which a left lower ureterotomy and a cystotomy incision were done to remove the remaining part of the calcified fractured stent in the lower ureter as well as the part casting the lower tip of the stent in the bladder.

Post-operative KUB revealed that the patient was free of stones on the left side (Fig. 1B). The serum creatinine dropped to 1.6 mg/dl and the urine was clear of infection 10 days postoperatively. The patient was scheduled for right nephrolithotomy one month later to remove the right renal calyceal stones.

DISCUSSION

The double-J ureteric stent has become one of the most basic and valuable tools in urology but a significant increase of adverse symptoms and complications in the form of hematuria, fever, downward migration, kinking of the splint, upward migration, and septicemia has been observed in cases where the DJ stent was indwelling for more than 6 weeks.[1,3,4] Stents may become calcified, brittle and lose tensile strength and may fracture spontaneously after being in situ for a longer time[4].

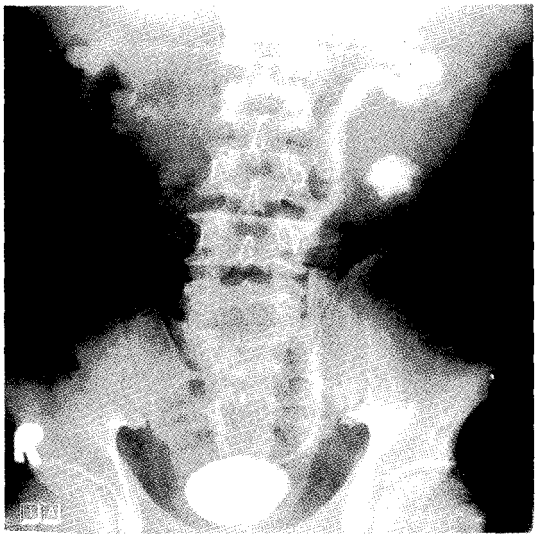

Fig. 1A: *Preoperative KUB showing stones casting the fractured ureteral stent as well as multiple calyceal stones*

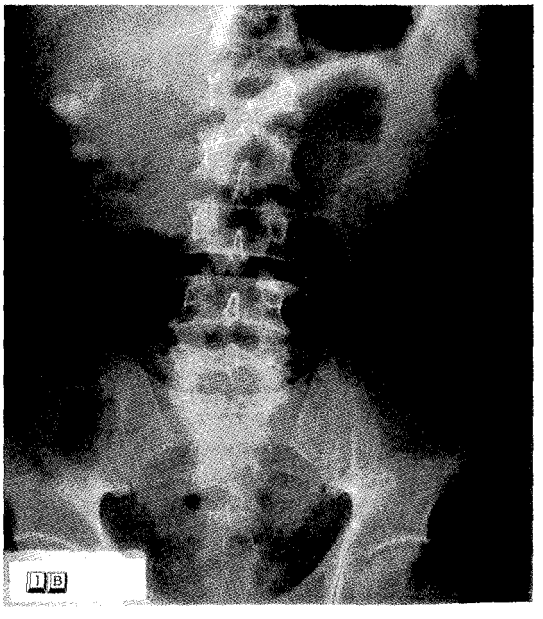

Fig. 1B: *Postoperative KUB showing stone-free state on the left side*

Singh[5] stated, for example, that Polyurethane stents were prone to encrustation. Their higher tensile strength contributing to their rigidity may encourage stasis with periluminal and endoluminal encrustation; these encrustations can create a problem at the time of removal.[6,7]

In 1996, Somers developed an algorithm for dealing with DJ stents. He stated that if there was no stent encrustation, a simple extraction under fluoroscopic control could be attempted. If significant stent calcification was present, extracorporeal shock-wave lithotripsy (ESWL) might be tried first. He suggested to reserve open procedures for patients with significant stent calcification (more than 3 mm of stent encrustation), for cases where the encrustation extends throughout the length of the stent, or for cases with large-volume upper tract calcification. For minimally calcified stents or for stents with upper curls that will not straighten out on gentle traction, percutaneous extraction can be attempted in the radiology suite.[8]

Since in our case the stent was multifractured with a large stone burden, two different approaches were carried out as described before to ensure removal of the whole stent with its casting stones. The first approach was through a left renal standard flank incision, the second one through a sub-umbilical midline incision.

Different studies found that the incidence of encrustation increased with the duration of stenting and that stone formers were at a higher risk of stent encrustation within a shorter time.

There is still some controversy about the factors predisposing encrustation. While Keane et al.[9] stated that encrustation was not associated with the level of urinary calcium, Robert et al.[10] found that calcium oxalate was the main crystalline phase, especially in the absence of infection, and suggested that prophylaxis of encrustation might consist of the preventive measures usually applied in cases of recurrent idiopathic calcium oxalate stones. According to Nakame et al.[11], encrustation and stone formation should be suspected in patients with persistent bacteriuria and/or pyuria. They recommended replacing the ureteral stent more frequently in such patients in order to avoid complications. Singh et al. recommended the use of an efficient stent log under the direct supervision of the physician with patients with risk factors being monitored more frequently to avoid mishaps and morbidity.[12]

In conclusion, although DJ ureteral stents have become an integral part of the urological armamentarium allowing good urinary drainage from the kidney to the bladder, their use should

be limited to those cases in which the benefit exceeds possible complications. We recommend the use of the guidelines and precautions suggested by Singh[5] to minimize stent complications; these include an informed consent, a careful documentation and a close follow-up, a good choice of the stent size and the use of hydrophilic stents. If prolonged stenting is required, the stent should be changed every three months in normal patients, but earlier in stone formers and chronic renal failure patients. The use of prophylactic antibiotics especially in susceptible patients is highly recommended.

REFERENCES

1. Wagenknecht LV. Indwelling ureteral splints. Retrospective study of applications and results of ureteral stents in Germany. *Eur Urol* 1981, 7:61.

2. Mattei A, Danuser H. Stents in urology. *Ther Umsch* 2003, 60:233.

3. Bierkens AF, Hendrikx AJ, Lemmens WA, Debruyne FM. Extracorporeal shock wave lithotripsy for large renal calculi: the role of ureteral stents. A randomized trial. *J Urol* 1991, 145:699.

4. Kehinde EO, Al-Awadi KA, Tawheed A, Al-Hunayan A, Ali Y, Mahmoud AH. Factors affecting the fate of prolonged forgotten 'J' stents. *Scand J Urol Nephrol* 2001, 35:222.

5. Singh I. Indwelling JJ ureteral stents. A current perspective and review of literature. *Indian J Surg* 2003, 65:405.

6. Shandera KC. Minimally invasive management of the calcified ureteral stent. *Tech Urol* 1997, 3:54.

7. Bukkapatnam R, Seigne J, Helal M. 1-step removal of encrusted retained ureteral stents. *J Urol* 2003, 170:1111.

8. Somers WJ. Management of forgotten or retained indwelling ureteral stents. *Urology* 1996, 47:431.

9. Keane PF, Bonner MC, Johnston SR, Zafar A, Gorman SP. Characterization of biofilm and encrustation on ureteric stents in vivo. *Br J Urol* 1994, 73:687.

10. Robert M, Boularan AM, El Sandid M, Grasset D. Double-J ureteric stent encrustations: clinical study on crystal formation on polyurethane stents. *Urol Int* 1997, 58:100.

11. Nakame Y, Yoshida K, Takahashi T, Saitoh H, Kaneoya F, Negishi T. Encrustation and stone formation in double J ureteral stent: report of two cases. *Hinyokika Kiyo* 1986, 32:871.

12. Singh I, Gupta NP, Hemal AK, Aron M, Seth A, Dogra PN. Severely encrusted polyurethane ureteral stents: management and analysis of potential risk factors. *Urology* 2001, 58:526.

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