

Management of the bilateral forgotten ureteral stents with open surgery

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Introduction

Ureteral D-J stents are frequently used in the therapy of ureteral stones or large renal calculi to ensure urinary drainage and kidney function during stone therapy [1]. They are inserted either in elective or imperative situations which should be removed within a safe time frame. If they are neglected for a long time, the forgotten stents were severely calcified and encrusted, and serious complications, including migration, fragmentation, encrustation, and stone formation, will occur. The patient may suffer from large stone formation, loin pain, recurrent urinary tract infections and hematuria [2–4]. The severe encrustation and stone formations may cause obstructions and threaten the renal unit [4]. An auxiliary procedure like extracorporeal- or intracorporeal-lithotripsy, and laser cystolithotripsy are required to make the patients' stents and stones free [5, 6]. But, we present one case of bilateral forgotten ureteral D-J stent for 8 years that was succeeded by successive surgical procedures.

Case report

A 60-year-old man with right renal calculus and left inferior ureteric calculus underwent pyelolithotomy on right, and

uneventful ureteroscopic removal of the calculus on left simultaneously and inserted D-J stent each side 8 years previously. The patient was discharged with advice for D-J stents removal after 1 month, but he lost to follow-up. The patient presented after 8 years with irritative voiding symptoms and intermittent hematuria for 6 months. The routine urianlysis showed red blood cell +++, white blood cell 0–2/HP and no pus cell. Renal function showed mild renal insufficiency with serum creatinine and blood urea nitrogen being 132.2 $\mu\text{mol/l}$ and 6.57 mmol/l , respectively. Abdominal ultrasound showed multiple stones of bilateral Kidney with mild hydronephrosis and no ureteric dilatation with normal rim of renal. The kidney ureter bladder radiography (KUB) and intravenous urography (IVU) revealed bilateral calcified stent with encrustation and multiple stones in the bilateral renal pelvis and bilateral upper ureters, and bilateral hydronephrosis (Fig. 1). The CT scan showed bilateral kidney and the urinary bladder with two D-J stents and multiple stone formation in both kidneys and the ureters. Interestingly, the large stones in the bilateral renal pelvis are radioparent in KUB, and bilateral hydronephrosis was not severe (Figs. 2, 3). Open surgery was successfully performed, in which pyelotomy associated with ureterotomy on the right was taken and pyelotomy on the left was also taken 1 month later. Two D-J stents were removed completely with the stones eliminated completely (Figs. 4, 5). D-J stent was inserted again during both operations, while pulled out by cystoscopy 1 month after operation. The patient has been followed-up for 10 months. Renal function was checked 1 month after operation with serum creatinine and blood urea nitrogen being 125.0 $\mu\text{mol/l}$ and 6.85 mmol/l , and the renal function put back with serum creatinine and blood urea nitrogen being 91.7 $\mu\text{mol/l}$ and 4.39 mmol/l , respectively after 6 months. There was no calculus residue and no hydronephrosis by ultrasound checks.

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Fig. 1 X-ray of the abdomen shows the bilateral forgotten stents with encrustation and stones, and hydronephrosis. The upper ends of stents circumvented in the radiopaque calculus were proved by open surgery (A: KUB, B: IVU)

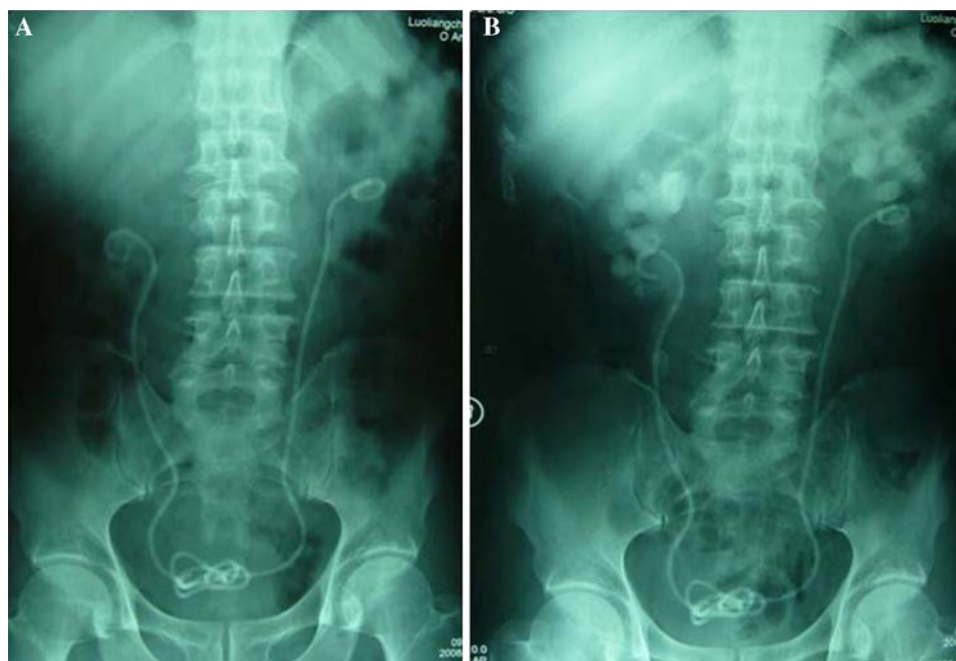
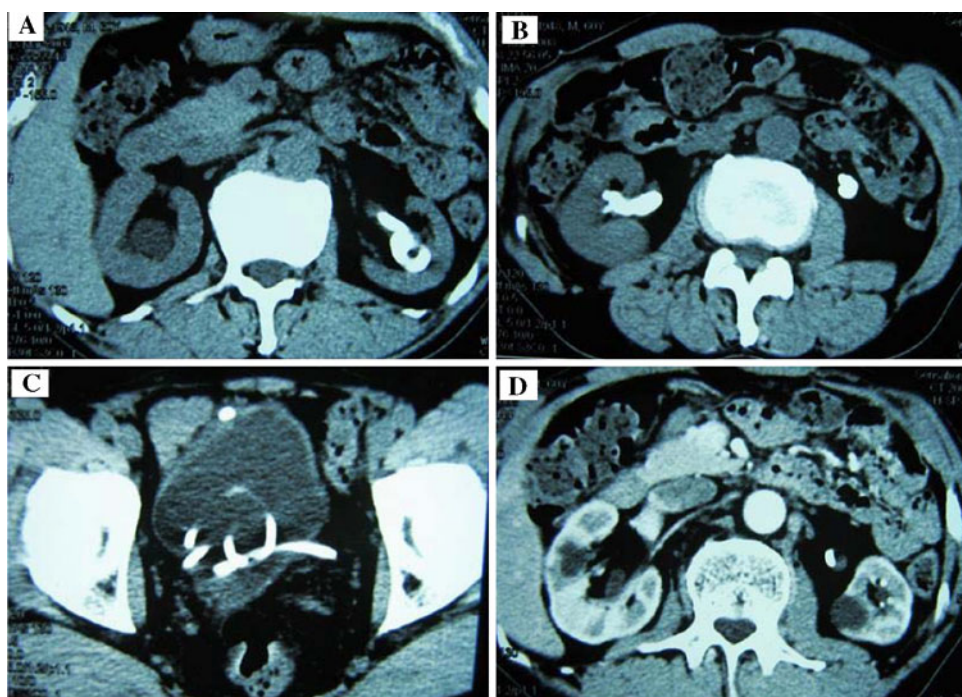


Fig. 2 Sequential transverse computed tomography (CT) scans (A–D) of the abdomen shows the stones with the stents in the bilateral renal pelvis and the urinary bladder (A, B, C Plain CT Scan, D Enhanced CT scan)



Discussion

D-J stents are a fundamental part of many urological procedures and their use is considered safe. But the forgotten stents with long time will lead to various complications such as pain, irritative bladder symptoms, haematuria, and infection. Furthermore, late complications including migration, stone formation, and fragmentation or even fistula formation to the iliac arteries are also known in

urologic practice because of being severely calcified and encrusted [5]. The clinical approach to the forgotten or retained stents is well described [7]. In the present case, the patient forgot to present to his urologist after operation with D-J stents inserted 8 years ago. He did not appear with severe urinary irritative symptoms and hematuria until half a year early because of drinking more water daily according to our interrogation. The fate of forgotten stents was dependent on the amount of encrustation around the

Fig. 3 Sequential coronal CT scans (A–D) of the abdomen shows the complete bilateral stents with stones in the bilateral renal pelvis and bilateral ureters of the urinary bladder. The completely incrustated but not yet fractured ureteral stents extends from the dilated bilateral renal pelvis all the way down to the urinary bladder

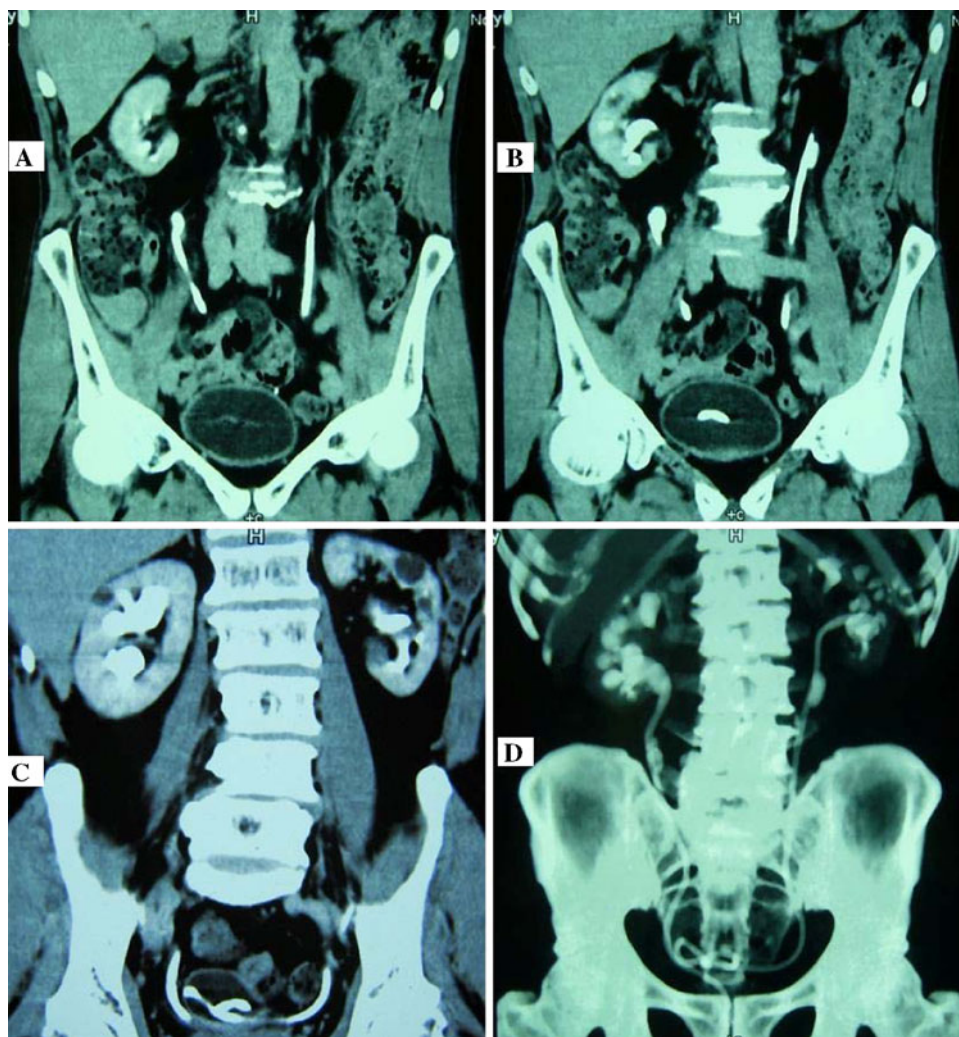
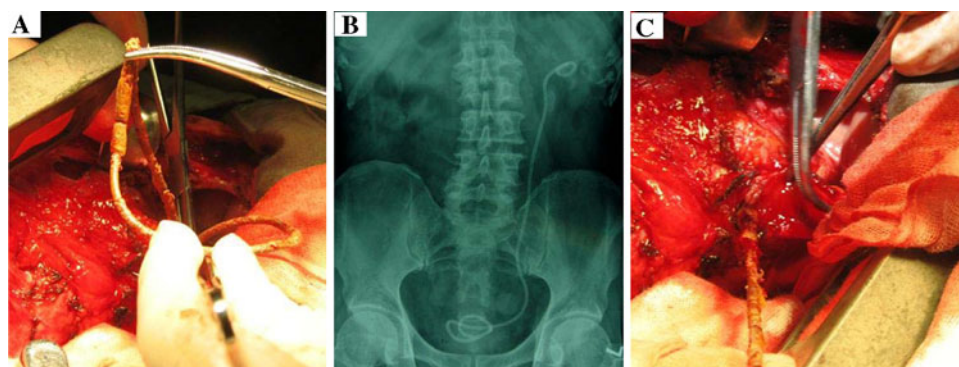


Fig. 4 A shows the right incrustated stent in the first operation; B shows the right urinary tract with no stent and stones residue, and the complete left stent with stones 1 month after the first operation (KUB); C shows the left incrustated stent in the second operation



stent and urine hypotonicity which tended to have less encrustation on the stent and the result of mild hydronephrosis [8]. As seen in the case presented, the way of drinking more water daily led to no severe encrustation and no aggravation of renal function, and decreased the rate of urinary tract infection. The most important principle is to avoid using excessive force, which can result in breakage

of the stent along with ureteral injury or ureteral avulsion [9]. The stents easily lead to fragmentation by the external force because of indwelling for 8 years, so we did not take percutaneous procedures and ESWL. We attempted to remove the stents by cystoscopic procedure after general anesthesia, and stopped to take open surgery because the stents were circumvented in the stones, especially in the



Fig. 5 The removed complete stents with complete stones. The radiopaque calculus circumvent the upper ends of the stents (A right, B left)

right renal pelvis. In the present case, open surgery succeeded in both sides with stents and all stones completely removed. And the result of follow-up was satisfactory.

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