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Case Report

Heavy Encrustation and Stone Formation on Forgotten Double “J” Ureteral Stent: A Case Report

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ARTICLE INFO

Article history:

Received: 14 July, 2020

Accepted: 24 July, 2020

Published: 31 July, 2020

Keywords:

Forgotten ureteral stents

shockwave lithotripsy

ureteroscopy

percutaneous nephrolithotomy

ABSTRACT

Background: Placement of double “J” ureteral stent for various indications is common in urological surgery. The encrustation and stone formation on forgotten DJ stents can result in significant morbidity and its management remains a challenging task.

Case Presentation: A 51 years male presented with history of right flank pain of over 6 months duration. He had undergone right pyelolithotomy for right renal stones 4 years ago at some other hospital. There was no medical record available and the patient did not present himself to the surgeon for follow-up. Clinical examination was unremarkable. His complete blood counts, random blood sugar, renal function tests were normal. Urinalysis revealed many pus cells/hpf. At ultrasonography, there were two renal stone with moderate hydronephrosis and a 2 cm vesical stone. An x-ray KUB, revealed a forgotten ureteric stent with stones at its both ends. The patient underwent cystoscopy and a large stone on ureteric stent was dealt with by litholapaxy. The stone on the proximal end of was managed by percutaneous lithotripsy and stent was removed. The postoperative recovery was uneventful. On stone analysis, it was made of calcium oxalate 30% and ammonium urate 70%.

Conclusion: The management of encrusted stents is challenging, and each case has to be dealt with individually depending on stone site and burden, and patient related factors. Endourological management is the preferred option. Adequate patient counseling and proper stent documentation (stent placement, proposed duration and removal of stent) is necessary to minimize stent related complications.

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Background

Placement of double-J (DJ) ureteral stent for various indications is common in urological surgical practice. Many a times the DJ stents are forgotten either because of illiteracy, inadequate patient counselling or non-compliance. Forgotten DJ stents may lead to infection, migration, encrustation and fragmentation. In addition, forgotten stents may be the cause of serious complications such as sepsis, renal failure and even mortality [1]. One specific complication associated with forgotten DJ stents is the encrustation and stone formation on forgotten DJ stents. It may be the cause of significant patient morbidity [2]. Stent encrustation rate increases with duration of placement [3]. The encrustation and stone

formation are also dependent on the stent material, with stents made of silicone more resistant to encrustation than polyurethane. Biofilms form on DJ stents protecting bacteria from local defense mechanisms and increasing tendency towards recurrent urinary tract [4]. Forgotten stents can be avoided by proper patient counselling, documentation of placement of DJ stent and need of timely removal of DJ stent.

Once patients present with DJ stents which are heavily encrusted and had overlying stone, the management is complex and challenging for the urologist faced with the situation. The management of each case of encrusted forgotten DJ stent has to be individualized and the present case describes the successful management of this rather complex case. The

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case highlights the importance of keeping record of DJ stent placement and their proposed time of removal to avoid such complication.

Case Report

A 51-year-old male presented with history of right flank pain of over 6 months duration. He had undergone open surgery (pyelolithotomy) for right renal stones at a private hospital 4 years ago. There was no medical record available and the patient did not present himself to the surgeon for follow-up. Clinical examination was unremarkable. His complete blood counts, random blood sugar, renal function tests were normal. Urinalysis revealed many pus cells/hpf. At ultrasonography, there was two 1.8 cm and 2 cm renal stone with moderate hydronephrosis and a 2 cm vesical stone. An x-ray KUB, revealed a forgotten ureteric stent with stones at its both ends (Figure 1). The patient underwent cystoscopy and a large stone on ureteric stent was dealt with by litholapaxy. For stone on the proximal end of was managed by percutaneous lithotripsy and stent was removed. The postoperative recovery was uneventful. On stone analysis, it was made of calcium oxalate 30% and ammonium urate 70%.



Figure 1: X-ray KUB showing encrustation and stone formation on forgotten DJ stent.

Discussion

Placement of double “J” (DJ) ureteral stent in urological practice is common. In current urological practice, the most common use of DJ stent is after ureterorenoscopic treatment of urinary stones [5]. The encrustation of ureteral stents can result in significant morbidity such as stone formation, recurrent obstruction and urinary tract infection [2]. The causes of encrustation are multifactorial and include long indwelling time, urinary sepsis, urinary stone disease, chemotherapy, chronic renal failure and congenital abnormalities [6]. The encrustation rate increases with duration of placement. El faqih *et al.* reported that the rate of stent encrustation at <6 weeks was 9.2% [3]. However, it increased to 47.5% at 6-12 weeks and 76.3% at >12 weeks. Recently, drug eluting and biodegradable ureteral stents have been developed to reduce encrustation and biofilm formation. Before any kind of intervention, proper evaluation of encrustations/stones on the DJ stents is necessary to estimate the actual stone burden.

For this purpose, a non-contrast CT can be useful which will also identify non-radiolucent uric acid encrustations on stent. The best approach for the management of retained encrusted stents is still remains under debate. The encrustation can occur at the upper or distal end of ureteral stent or on its main body. The management depends on the site of encrustation, size of stone burden, function of the affected kidney and availability of technology [2, 7]. The reported techniques for dealing with encrusted stones include cystolitholapaxy, retrograde ureteroscopic manipulation, intracorporeal or extracorporeal lithotripsy, percutaneous nephrolithotomy (PCNL), and open surgical removal [2, 5, 7]. In patients with no visible encrustations on KUB x-ray or in those with mild encrustations, attempt at cystoscopic removal is advocated, provided use of excessive force is avoided which may lead to severe complications e.g. ureteric avulsion or ureteral injury [8]. The encrustations/ stones on the distal end of ureteral stent are generally managed by cystolithotripsy or litholapaxy [7].

The most controversial and difficult part in the management of forgotten stents is the encrusted upper end. For mild stent encrustations on proximal end of ureteral stent, extracorporeal shockwave lithotripsy (ESWL) has been suggested in kidneys that have reasonably good function to allow spontaneous clearance of stone fragment after ESWL [9]. Other authors favor ureteroscopic lithotripsy (pneumatic, ultrasonic or laser) [7, 10]. Vanderbrink *et al.* suggest percutaneous approach as the preferred primary approach in patients where stone size is more than 2 cm or when significant encrustation on the proximal ureteral end of the stent is present [11].

In some patients, multiple endourological techniques are required for management of encrusted ureteral stents especially if encrustation involves bladder, kidney and ureter. Singh *et al.* reported multiple accesses and approaches (including open surgery) for management of severely encrusted polyurethane ureteral stents [9]. One stage removal of encrusted retained ureteral stents by combined endourological approach has been reported by various authors [5, 7].

Although various techniques can be employed for the management of forgotten encrusted ureteral stents, but the prevention of such complications still remains the best treatment. There must be a clear indication for placement of ureteral stent. The placement and removal of ureteral stent must be documented. The stent should be kept indwelling for a period as short as possible. A proper record of due date for stent removal should be maintained. For this purpose, a computerized tracking program for stent removal has been proposed by some authors, while others have suggested a web-based stent registry with automatic recall application [12, 13].

Conclusion

Encrustation and stone formation on forgotten ureteral stents may lead to significant morbidity and potentially life-threatening complications. The management of encrusted stents pose a challenging task to the urologist faced with the problem. There are various techniques for management of forgotten encrusted stents and each case has to be dealt with individually depending on stone site and burden, and patient related factors. Adequate patient counseling and proper stent documentation

(stent placement, proposed duration and removal of stent) is necessary to minimize stent related complications.

Conflicts of Interest

None.

Consent

A written informed consent of the patient was obtained for publication of this case report.

Author Contributions

The case report was drafted by Shoaib Rafique. Muhammad Rafique reviewed the manuscript. Both authors read and approved the manuscript.

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