Section: General Surgery

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Case Report

FORGOTTEN DOUBLE J URETERAL STENT WITH FRAGMENTATION AND MIGRATION LEADING TO VESICAL CALCULUS FORMATION: A CASE REPORT

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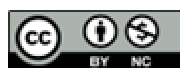

ABSTRACT

Background: Double J (DJ) ureteral stents are routinely employed in urological practice to maintain ureteral patency and facilitate urinary drainage in various obstructive conditions. Despite their clinical utility, prolonged indwelling of these stents without appropriate follow-up can result in significant complications, including encrustation, infection, fragmentation, migration, and calculus formation. Forgotten ureteral stents continue to represent a preventable yet important clinical concern, particularly in settings where patient compliance and follow-up systems are inadequate. The aim is to report a rare case of a neglected long-term DJ stent complicated by fragmentation and migration with subsequent vesical calculus formation, and to emphasize the associated diagnostic and therapeutic challenges. **Materials and Methods:** A 46-year-old female presented with complaints of dysuria, intermittent hematuria, and lower urinary tract symptoms. She had undergone right-sided open pyelolithotomy a decade earlier, during which a DJ stent was inserted but not removed thereafter. Diagnostic evaluation included clinical assessment, urine analysis, ultrasonography, and X-ray KUB. A combined surgical approach involving endoscopic and open procedures was planned for management. **Result:** Radiological investigations demonstrated a fragmented right DJ stent, with its distal coil located in the urinary bladder, associated with a 3.5 cm vesical calculus. Urine culture yielded growth of Escherichia coli. The patient was successfully managed with ureteroscopic retrieval of the proximal stent fragment followed by open cystolithotomy for stone extraction. The postoperative course was uneventful, and complete removal was confirmed on follow-up imaging. **Conclusion:** Neglected DJ stents can lead to serious complications such as fragmentation and stone formation. Ensuring timely removal, proper patient counseling, and use of stent tracking systems are crucial to prevent such avoidable morbidity.

INTRODUCTION

Double J (DJ) ureteral stents play a pivotal role in contemporary urological practice, serving as an essential means to maintain ureteral patency, ensure continuous urinary drainage, and prevent obstruction in a wide range of clinical scenarios. These include urolithiasis, ureteral strictures, malignancies, and postoperative situations requiring temporary internal drainage. Structurally, DJ stents are characterized by their curled ends, which help anchor the device within the renal pelvis and urinary bladder, thereby minimizing the risk of displacement. Although highly effective, these stents are intended for short-term use and require timely removal or replacement to avoid complications.[1]

The recommended duration of stent placement varies based on the underlying indication but generally ranges from a few weeks to a maximum of three to six months. Exceeding this duration significantly increases the likelihood of adverse outcomes. Prolonged indwelling may lead to complications such as encrustation due to mineral deposition on the stent surface, bacterial colonization leading to urinary tract infections, structural weakening and fragmentation of the stent material, and migration either proximally toward the

kidney or distally into the bladder. Among these, encrustation and subsequent stone formation are the most frequently encountered and clinically important complications, often complicating retrieval and management.[2]

Forgotten or neglected DJ stents constitute a major yet preventable problem in urological care. Such cases are often the result of inadequate patient counseling, poor compliance, lack of structured follow-up systems, and insufficient documentation at discharge. Over time, the continuous exposure of the stent to urine promotes the formation of bacterial biofilms and deposition of urinary salts, which progressively leads to encrustation.[3] If left unaddressed, this process can culminate in calculus formation along the stent. Additionally, chronic exposure to urine can weaken the stent material, predisposing it to fragmentation into multiple pieces, thereby making retrieval more challenging and increasing patient morbidity.[4]

One of the notable but relatively uncommon complications is the formation of vesical calculus around a migrated or fragmented distal portion of the stent. When the lower coil remains within the urinary bladder for an extended period, it can act as a foreign body nidus, facilitating stone formation. Patients with such conditions typically present with lower urinary tract symptoms, including dysuria, increased frequency, urgency, hematuria, and recurrent urinary infections. If diagnosis and intervention are delayed, further complications such as urinary obstruction, deterioration of renal function, and the necessity for more invasive surgical procedures may arise.[5]

With advancements in endourological techniques, minimally invasive approaches such as ureteroscopy and cystolitholapaxy have become standard for stent retrieval. However, in cases involving significant encrustation, large stone burden, or fragmentation, a combination of endoscopic, percutaneous, and open surgical methods may be required to achieve complete clearance. Consequently, prevention remains the most effective strategy in addressing this issue.[6]

The present case report describes a rare instance of a DJ stent retained for an extended period of ten years, which subsequently led to fragmentation, migration, and vesical calculus formation. This case highlights the critical importance of timely stent removal, thorough patient education, and the implementation of reliable stent tracking and recall systems to prevent such avoidable and potentially serious complications.[7]

CASE DESCRIPTION

A 46-year-old female presented to the outpatient department with complaints of dysuria, intermittent hematuria, and lower urinary tract symptoms including increased urinary frequency and urgency for the past several months. There was no history of fever or flank pain. On detailed history, the patient revealed that she had undergone right-sided open pyelolithotomy 10 years earlier for renal calculi, during which a DJ ureteral stent had been placed. However, she did not return for follow-up and was unaware that the stent required removal.

On clinical examination, the patient was stable with no significant abdominal tenderness. Laboratory investigations showed mild pyuria, and urine culture grew Escherichia coli sensitive to colistin. Renal function tests were within normal limits.

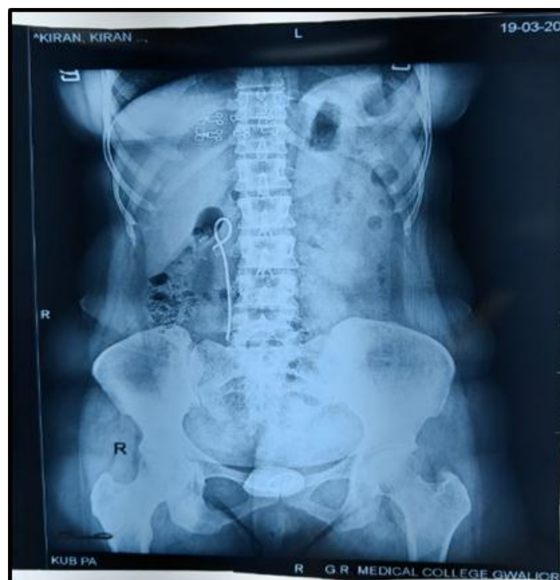

Figure 1: Abdominal Xray KUB Right Ureter Stent

Ultrasonography of the abdomen and pelvis revealed a 3.5 cm vesical calculus with an echogenic linear structure suggestive of a retained stent fragment. X-ray KUB confirmed the presence of a fragmented right DJ stent, with the proximal portion located in the ureter and the distal coil lying within the urinary bladder. The bladder calculus appeared to have formed around the distal fragment of the stent.

Based on these findings, a diagnosis of a forgotten fragmented DJ stent with associated vesical calculus was made. A staged surgical approach was planned. Initially, ureteroscopic retrieval of the proximal stent fragment was performed under spinal anesthesia. The procedure was successful, and the ureteral segment was cleared without complications.

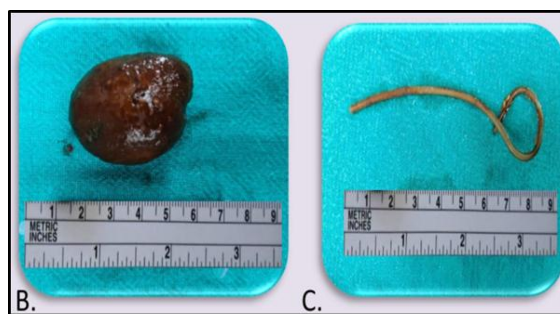

Figure 2: Extracted Ureteric Stone with DoubleJ Stent

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Subsequently, the patient underwent open cystolithotomy for removal of the bladder stone. Intraoperatively, a large vesical calculus was identified with an embedded stent fragment acting as a nidus. The stone and stent fragment were removed in toto.

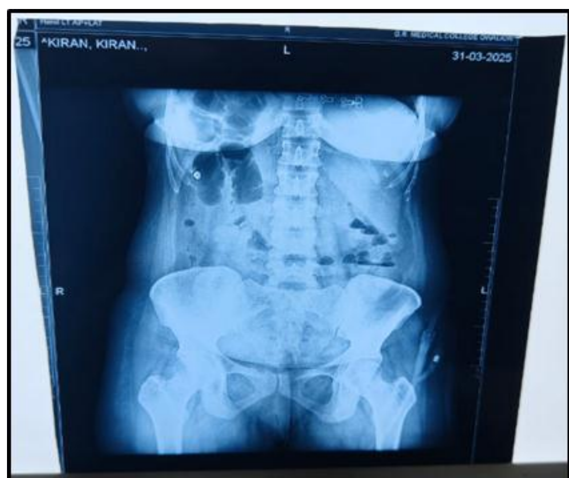

Figure 3: Postoperative KUB Xray Abdomen

Postoperative recovery was uneventful. The patient was managed with appropriate antibiotics based on culture sensitivity and was discharged in stable condition. A follow-up X-ray KUB confirmed complete removal of all stent fragments and absence of residual calculi.

The patient was counseled regarding the importance of follow-up and preventive measures to avoid recurrence.

DISCUSSION

Forgotten DJ ureteral stents pose a considerable clinical challenge because of their ability to produce severe and occasionally life-threatening complications when left in situ for prolonged periods. The complications most frequently associated with long-term indwelling stents include encrustation, infection, migration, and fragmentation. These adverse events are strongly time-dependent, with a marked increase in incidence observed when the stent remains in place beyond the recommended duration of three to six months.[8]

Encrustation is one of the most common and clinically significant complications. It results from the deposition of urinary salts such as calcium oxalate, calcium phosphate, and struvite onto the stent surface. This process is further accelerated in the presence of urinary tract infections, particularly those caused by urease-producing organisms, which increase urinary alkalinity and promote crystallization.[9] Even non–urease-producing bacteria can contribute to biofilm formation, which serves as a scaffold for mineral deposition. In the present case, infection with Escherichia coli likely facilitated biofilm development, thereby enhancing encrustation and ultimately leading to stone formation.[10]

Another important complication is stent fragmentation, which typically arises due to prolonged exposure of the polymer material to urine. Over time, chemical degradation weakens the structural integrity of the stent, rendering it brittle and susceptible to breakage. Once fragmented, the stent becomes more difficult to retrieve, especially when multiple segments are distributed along different parts of the urinary tract. Migration of these fragments, either proximally or distally, further complicates the clinical scenario and may necessitate multiple interventions for complete removal.[11]

Vesical calculus formation around the distal segment of a migrated or retained stent is a recognized but relatively uncommon phenomenon. The urinary bladder provides a conducive environment for stone formation, and the retained stent fragment acts as a foreign body nidus, promoting crystallization and growth of calculi. Patients with such conditions commonly present with lower urinary tract symptoms, including dysuria, increased urinary frequency, urgency, hematuria, and recurrent infections. These symptoms, although often nonspecific, should raise suspicion in patients with a prior history of stent placement.[5,12]

The management of forgotten and complicated stents is dictated by the degree of encrustation, extent of fragmentation, and anatomical location of retained segments. Minimally invasive approaches such as ureteroscopy and cystolitholapaxy are generally preferred due to reduced morbidity and quicker recovery. However, in cases involving large bladder stones, heavy encrustation, or multiple fragmented components, open surgical procedures may be required. A combined approach, integrating endoscopic and open techniques, often provides the most effective means of achieving complete clearance, as demonstrated in this case.[13]

Preventive strategies remain the cornerstone of management. Adequate patient counseling regarding the necessity of timely stent removal, meticulous documentation, and the use of stent tracking systems such as electronic registries or automated reminders are essential in minimizing the incidence of forgotten stents. Additionally, the medico-legal implications of retained stents cannot be overlooked, as failure to ensure appropriate follow-up and documentation may result in legal consequences for the treating physician.[14]

Clinical Significance

This case highlights the serious consequences of neglected DJ ureteral stents and emphasizes the importance of preventive strategies in urological practice. Forgotten stents can lead to complex complications such as fragmentation, migration, infection, and large stone formation, significantly increasing patient morbidity and healthcare burden. Early identification through imaging and appropriate

intervention is crucial for successful management. The case also demonstrates that combined surgical approaches may be necessary for complete removal in complicated cases. From a clinical perspective, this case underscores the need for strict follow-up protocols and patient education. Implementation of stent tracking systems, including digital alerts and proper discharge documentation, can significantly reduce the incidence of forgotten stents. Ultimately, prevention through awareness and systematic follow-up is key to avoiding such avoidable and potentially serious complications.

CONCLUSION

Forgotten DJ ureteral stents are a preventable cause of significant urological morbidity. Prolonged indwelling can result in complications such as encrustation, fragmentation, migration, and vesical calculus formation, often requiring complex surgical management. This case illustrates the importance of timely diagnosis and a multidisciplinary approach to achieve complete clearance. Strict adherence to follow-up schedules, proper patient counseling, and the use of stent tracking systems are essential in preventing such complications. Early intervention and awareness can significantly reduce morbidity and improve patient outcomes in cases of retained ureteral stents.

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