

Migration of double J stent into the inferior vena cava and the right atrium

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ABSTRACT

Migration of a ureteric double J stent down into the bladder or up into the kidney is a well known complication. We recently encountered a case where the stent migrated into the vascular system following attempted ureteroscopy for a lower ureteric calculus. The patient required open surgical exploration for stent retrieval.

Key words: Double “J” stent, migration, ureteroscopy complications

INTRODUCTION

A double J stent (DJS) also known as “JJ stent” forms an integral part of the armamentarium in an endourology set up. The relative indications of DJS after an ureteroscopy include ureteroscopy for an impacted ureteric stone, solitary kidney or any endourologic procedure performed bilaterally. The well-known complications of DJS include encrustation, fragmentation, distal, and proximal migration, stenturia, and severe lower urinary tract symptoms which include dysuria. Most of these complications are self limiting and can be managed with suitable conservative and endourologic interventions. We report a case of rare and serious vascular migration. The literature is scant regarding the management of such situations. We discuss the diagnostic dilemmas and management option in such cases.

CASE HISTORY

A 43-year-old female patient presented to our out-patient department with history of attempted

ureteroscopy for a lower ureteric calculus elsewhere. The operating surgeon had difficulty in negotiating the ureter and could not reach the stone. The procedure was performed without fluoroscopy control, a 0.038 inch guidewire and 8Fr semi-rigid ureteroscope were used. The surgeon could not reach the stone because of poor vision and hence placed a DJS with difficulty. The patient was thereafter referred to us. A contrast CT scan (CECT) was obtained to ascertain the position of the stent. The CECT showed a migrated DJS into the external iliac vein with the upper end seen in the inferior vena cava and the atrium. The CECT did not show the lower end of the stent in the bladder [Figure 1].

We planned a ureteroscopy and removal of the migrated stent. A semi-rigid ureteroscopy was performed; the lower ureteric calculus was visualized, fragmented, and removed. The ureteroscope was negotiated into the upper ureter but the stent could not be visualized, confirming complete extrusion of the stent and its subsequent extra anatomic migration in the external iliac vein as suggested on CECT [Figure 2]. The patient was explored through a Gibson’s incision, vascular control was gained proximally and distally on the external iliac vein with a Satinsky clamp and the stent was removed [Figure 2]. Postoperatively, the patient was started on anticoagulation therapy and had an uneventful recovery.

DISCUSSION

The common complications of DJS include encrustation, fracture, and migration proximally and distally. Rare complications include knotting and vascular migration of stents.^[1] There are situations where the stent has to be placed in an antegrade manner, these instances include those with obstructive uropathy due to pelvic malignancy. Rao *et al.*, described their experience with extra anatomic complications

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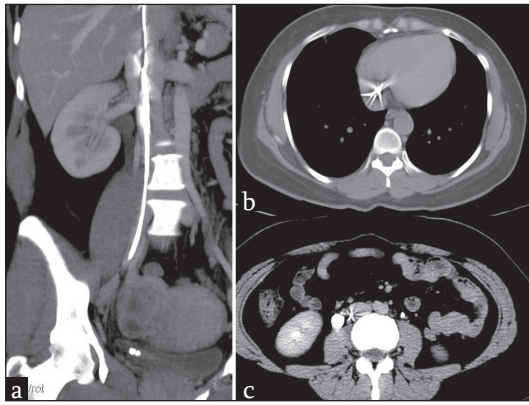


Figure 1: CECT shows a) stent in the Inferior Vena Cava (IVC); b) stent seen in the right atrium; c) the stent is seen in the IVC adjacent to the contrast filled lumen of the ureter

with antegrade double J stenting.^[2] These included retroperitoneal hematoma, pelvic urinoma, ureterovaginal fistula, and ureterorectal fistula. The authors postulated that the risk factors for occurrence of such complications include pelvic malignancy, surgery and prior history of ureteric reimplantation. In addition, they noted that a stent adjacent to any vascular structure is prone to vascular erosion.

In our patient, due to the impacted stone, the surgeon probably had difficulty in placing the 0.038 inch guidewire which may have gone submucosally into the vessels. Later, the stone could not be approached because of poor vision and the surgeon decided to defer the procedure and place a stent. The stent was inserted under cystoscopy monitoring and probably did not coil in the bladder, leading to migration into the lower ureter and the iliac vessel.

Although rare, intravascular migration of DJS has been reported following pyelolithotomy. Michalopoulos *et al.*, reported pulmonary thromboembolism because of migration of stent into the heart and left pulmonary arterial system after a pyelolithotomy. This complication was detected in the immediate postoperative period. The stent was removed using the femoral vein as an access site.^[3] Another recent report describes migration of a ureteric stent into the vascular system with endovascular removal.^[4]

Certain strategies may reduce risks of such migration. It is imperative that the surgeon not force the guidewire while negotiating a tight narrowing/stricture or an impacted stone. A hydrophilic glidewire helps to negotiate difficult narrowing. If there is a doubt regarding the proper position of the wire, a contrast study done with a double lumen catheter will help. Second, fluoroscopy/endourologic controlled insertion prevents such complications. Third, the surgeon should have a high degree of suspicion if the patient has unusual symptoms such as a severe pain, severe hematuria after DJS insertion. Finally, a postoperative X-ray would show an abnormal lie of the stent and raise doubts. A contrast CT imaging will confirm the diagnosis.

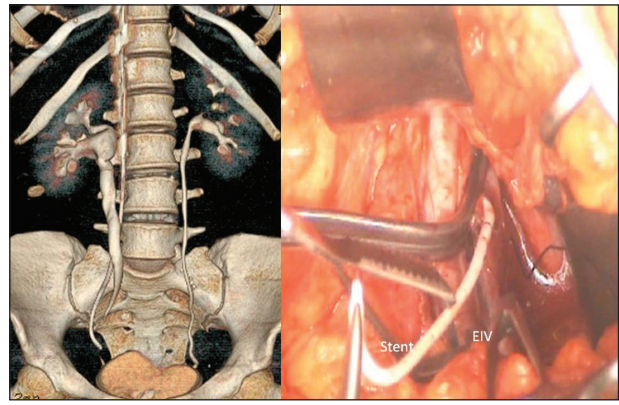


Figure 2: Volume rendered (VR) CECT reconstruction showing abnormal lie of the stent. Note that the lower end is not coiled and the upper end extends beyond the thoracic cage. Open exploration was done, proximal and distal control of external iliac vein (EIV) was obtained and stent was removed under vision

In our case, the upper end of the stent is appeared to be in the thorax [Figure 1] while the lower end was not coiled in the bladder. The treatment options in such a case include endovascular intervention, endourologic removal, and open surgical removal. The treatment is dictated by position of the distal coil of the DJS, the general condition of the patient, available expertise, and infrastructure.

The migrated stent can be removed with vascular intervention using the femoral access. An access sheath inserted through the femoral vessel acts as a conduit for removal of the foreign body. Open surgical removal is a safe and efficacious option if expertise for endovascular intervention is not available.

CONCLUSION

Vascular migration of ureteric stents is a rare but morbid complication of DJS. The key in management includes high degree of suspicion and early intervention. The treatment options include endourologic, endovascular, and open approach.

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