Case Report

Accidental insertion of double-J in the inferior vena cava in a patient with retroperitoneal fibrosis: a case report

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Background: Implantation of the double-J stent is a common procedure in urology. The function of this device is to maintain the flow of urine from the ureteropelvic junction to the urinary bladder when the ureter is blocked or partially blocked for some reason. Once in place, the stent may cause low back pain, hematuria, symptoms of urinary irritation, a reduction in labor capacity, infection and calcification which are side effects that are easy to manage. However, severe complications can occur, such as the insertion of the stent into the circulatory system, such as the vena cava, which, although uncommon, is one of the most severe and difficult to manage. This work reports the case of a patient with the accidental insertion of a double-J stent into the inferior vena cava.

Case Description: An 80-year-old female patient with repeated urinary tract infections using a double-J stent due to stenosis of the right distal ureter distal presenting retroperitoneal fibrosis secondary to previous radiotherapy. The patient had Lynch syndrome, ovarian and uterine cancer, colorectal cancer, and nephrolithiasis. She had been submitted to multiple previous surgeries. Due to the possibility of viral infection by coronavirus disease 2019 (COVID-19), chest computed tomography was performed, which suggested the insertion of the double-J stent in the inferior vena cava, confirmed by abdominal computed tomography. As the distal end of the stent was within the bladder, the decision was made to remove the stent by cystoscopy, with the implantation of a new stent using fluoroscopic control for the confirmation of its trajectory. No intraoperative or postoperative complications occurred and the patient is currently in outpatient follow-up.

Conclusions: Situations such as this require caution during the implantation of the drainage device, with the occurrence of resistance indicating the need to discontinue the procedure and perform a new assessment with imaging exams. No intraoperative or postoperative complications occurred and the patient is currently in outpatient follow-up.

Keywords: Double-J stent; inferior cava vena; retroperitoneal fibrosis; urology; case report

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Introduction

The placement of the double-J stent is a common procedure in urology (1-3). The function of this device is to maintain the flow of urine from the ureteropelvic junction to the urinary bladder when the ureter is blocked or partially blocked for some reason. The stent can also be implanted to maintain the patency of the ureteral lumen following reconstruction surgery or trauma. Once in place, the stent may cause low back pain, hematuria, symptoms of urinary irritation, a reduction in labor capacity, 1 infection and calcification (1,3), which are side effects that are easy to manage. However, more serious complications may occur, such as the migration of the stent to the circulatory system, which, although uncommon, is the most severe complication and the most difficult to manage (2-5). The following case was presented in accordance with the CARE reporting checklist (available at https://acr.amegroups.com/article/view/10.21037/acr-22-93/rc).

Case presentation

Female patient, 80 years of age, with recurring urinary tract infections (UTI), using a double-J stent since December 2020 for stenosis of the distal right ureter due to retroperitoneal fibrosis secondary to previous radiotherapy. The patient had Lynch syndrome, chronic stage 3B kidney disease, ovarian and uterine cancer, colorectal cancer and nephrolithiasis.

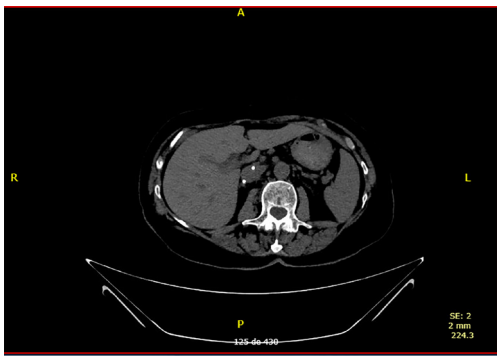

Figure 1 Abdominal computed tomogram showing proximal end of double-J stent positioned in inferior vena cava.

The patient had been submitted to multiple previous surgeries: left percutaneous nephrolithotomy in 2014, Miles surgery in 2010, total hysterectomy, cholecystectomy, appendicectomy and total colectomy, requiring an ileostomy as well as the need for external radiotherapy, which caused retroperitoneal fibrosis and difficulty draining the right renal system. A double-J stent was implanted with scheduled replacements to maintain the patency of the ureter.

In May 2021, the stent was replaced due to an episode of UTI associated with kidney dysfunction. The hypothesis was raised of the formation of biofilm on the stent.

Subsequent laboratory findings revealed worsened kidney function, along with cough with little production and prostration. Due to the possibility of viral infection by coronavirus disease 2019 (COVID-19), chest computed tomography was performed, which suggested the insertion of the double-J stent in the inferior vena cava, which was confirmed by abdominal computed tomography (*Figures 1*,*2*).

The urology team removed the stent in an urgent procedure. As the distal end of the stent was in the bladder, removal was performed by cystoscopy and a new stent was placed with fluoroscopic control for the confirmation of its trajectory. No intraoperative or postoperative complications occurred.

The patient is currently in outpatient follow-up with the nephrology and oncology teams, with no evidence of the recurrence of the base disease.

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent

Highlight box

Key findings

- This work reports the case of a patient with the accidental insertion of a double-J stent into the inferior vena cava.

What is known and what is new?

- Implantation of the double-J stent is a common procedure in urology. The function of this device is to maintain the flow of urine from the ureteropelvic junction to the urinary bladder. Once in place, the stent may cause low back pain, hematuria, symptoms of urinary irritation, infection and calcification which are side effects that are easy to manage. However, severe complications can occur, such as the insertion of the stent into the circulatory system, such as the vena cava, one of the most severe and difficult to manage.

What is the implication, and what should change now?

- Situations such as this require caution during the implantation of the drainage device, be careful about the complications and be aware of the possibility of unusual complications and the need for rapid management. Be aware of the possibility of unusual complications and the need for rapid management.

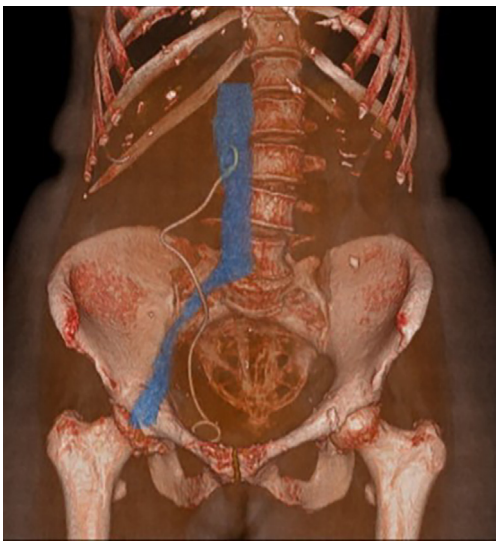

Figure 2 Reconstruction of abdominal computed tomogram showing proximal end of double-J stent positioned in inferior vena cava.

was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal.

Discussion

The placement of the double-J stent is a common procedure in urology (6). The function of this device is to maintain the flow of urine from the ureteropelvic junction to the urinary bladder when the ureter is blocked or partially blocked due to an intrinsic cause, such as calculi or urothelial carcinoma, or external cause, such as compression by masses or lymph node enlargement (1-4). In the present case, obstruction was due to post-radiotherapy retroperitoneal fibrosis.

Migration of the double-J stent to the cardiovascular system is described little in the literature. The first report was published in 2002 and migration of the stent caused pulmonary thromboembolism in the patient (7), with other reports of migration to the inferior vena cava, right atrium, right ventricle and kidney (7-11). If the stent is positioned incorrectly, symptoms may include pain, fever, hematuria and urinary incontinence (5). In the present case, the proximal end of the double-J stent accidently invaded the inferior vena cava.

The patient had recurrent episodes of UTI with the exacerbation of chronic kidney disease. She also had considerable anatomical alterations due to previous abdominopelvic cancers and consequent surgeries for treatment. The pelvis had also been submitted to radiotherapy, further contributing to anatomical disorganization.

During the placement of the double-J stent, normal anatomy is considered (1,11) as means of location for the surgeon, who should position one end of the stent in the renal pelvis and the other end in the urinary bladder to maintain drainage. There is an anatomical relationship between the ureter, iliac vein and inferior vena cava (11).

In the present case, the patient had anatomical abnormalities resulting from previous interventions as well as inflammation of the urinary system due to the infectious process, which certainly contributed to the migration of the proximal end of the double-J stent to inside the inferior vena cava.

Situations such as this require caution when placing the drainage device. If resistance is encountered during implantation, the procedure should be suspended and further assessment with imaging exams is warranted.

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Footnote

Reporting Checklist: The authors have completed the CARE reporting checklist. Available at https://acr.amegroups.com/article/view/10.21037/acr-22-93/rc

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://acr.amegroups.com/article/view/10.21037/acr-22-93/coif). LCFS serves as an unpaid Section Head of *AME Case Reports*. FNFJ serves as an unpaid Section Editor of *AME Case Reports*. The other authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying

images. A copy of the written consent is available for review by the editorial office of this journal.

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