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Ureterovaginal fistula after hysterectomy with double-J stent misplacement into the inferior vena cava: a case report

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Abstract

Background Double-J stent placement is a common and generally safe procedure in urology. However, rare complications such as stent misplacement into vascular structures can occur, posing significant risks. The case presented herein highlights an exceedingly rare complication of stent misplacement into the inferior vena cava during the management of a vesicovaginal fistula, emphasizing the importance of prompt recognition and multidisciplinary intervention.

Case presentation In February 2023, a 48-year-old Iranian woman with history of total abdominal hysterectomy presented with complaints of watery vaginal discharge 1 month postoperatively. She was diagnosed with a vesicovaginal fistula and underwent cystoscopy, ureteroscopy, and attempted placement of a double-J stent. Intraoperatively, the stent was found to be misplaced in the suprarenal segment of the inferior vena cava, near the right atrium, as confirmed by postoperative imaging. The patient subsequently underwent laparotomy for stent removal and ureteral reimplantation. A multidisciplinary surgical team, including vascular surgeons, participated in the procedure to mitigate potential complications. The stent was successfully removed via ureteroscopy without complications, and the ureter was reconnected to the bladder. The patient was followed up for 3 months after stent removal. She remained asymptomatic, with no recurrence of urinary leakage, ureteral obstruction, or thrombotic complications. Follow-up imaging confirmed proper ureteral healing and the absence of any further stent migration. At the final follow-up, the patient reported full recovery with no discomfort or residual symptoms. Written informed consent for publication of this case and accompanying images was obtained from both the patient and the hospital's ethics committee.

Conclusion This case demonstrates the need for vigilance during stent placement, particularly in patients with altered anatomy. It also underscores the value of timely imaging to identify complications and the importance of a multidisciplinary surgical approach in ensuring successful outcomes. The report contributes to the literature on managing rare urological complications and highlights the role of advanced endoscopic and surgical techniques.

Keywords Hysterectomy complication, Ureterovaginal fistula, Double-J stent, Stent misplacement, Urological complications

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Introduction

Ureterovaginal fistula is a rare but significant complication that can arise following gynecological surgeries such as hysterectomy. This condition results in abnormal communication between the ureter and the vaginal cavity, often presenting with continuous urinary leakage and

significant impact on the patient's quality of life. Surgical intervention is typically required for definitive management, often involving ureteral stenting or ureteral reimplantation [1].

While ureteral stenting is a common and generally safe procedure, errors in stent placement, though uncommon, can lead to serious complications. Misplacement of a double-J stent into the inferior vena cava (IVC), for instance, is exceedingly rare and requires prompt identification and corrective measures to prevent life-threatening outcomes [2].

In this report, we present the case of a 48-year-old Iranian woman who developed a ureterovaginal fistula following hysterectomy. During surgical management, a double-J stent was misplaced into the IVC. The complication was successfully resolved with cystoscopic stent removal and subsequent ureteral reimplantation. This case highlights the importance of careful intraoperative technique and the need for vigilance in managing unexpected complications.

Case report

A 48-year-old Iranian woman who had undergone total abdominal hysterectomy (TAH) presented 1 month later with complaints of watery vaginal discharge. She was admitted for evaluation and treatment. During hospitalization, she was diagnosed with a vesicovaginal fistula (VVF) and underwent cystoscopy and ureteroscopy with placement of a double-J stent.

Intraoperatively, the urologist noticed that the double-J stent had not entered the bladder; instead, its distal end was lodged in the cavity at the site of the ureteral transection. Despite extensive efforts, the stent could not be properly positioned. Consequently, a nephrostomy was placed, and the surgery was concluded.

Postoperatively, a computed tomography (CT) scan of the abdomen and pelvis revealed that the proximal end of the double-J stent was in the heart (Fig. 1). As shown in Fig. 2, the CT scan confirmed migration of the double-J stent into the suprarenal segment of the IVC, near the right atrium. An ultrasound examination was not performed at this stage but could have provided additional insights into stent positioning and served as an alternative diagnostic tool. The patient subsequently underwent laparotomy for removal of the stent and ureteral re-anastomosis to the bladder. The surgical team included a general surgeon and two urologists, with a vascular surgery team on standby for potential bleeding from the IVC.

Ultimately, the double-J stent was successfully removed from the IVC using a ureteroscope without any complications, and the ureter–bladder connection was

Fig. 1 Computed tomography of the abdomen/pelvis (sagittal slice) in the immediate postoperative period. Arrow indicates the proximal tip of the double-J stent located in the right atrium of the heart

Fig. 2 Computed tomography of the abdomen/pelvis (coronal slice) in the preoperative period. Arrow indicates the course of the double-J stent extending from the left renal vein into the suprarenal segment of the inferior vena cava (IVC). Arrow 1: Shows the left renal vein. Arrow 2: Indicates the double-J stent misdirected into the inferior vena cava (IVC). Arrow 3: Points to the suprarenal segment of the IVC where the proximal end of the stent is located

re-established. Three months after stent removal, the patient remained asymptomatic and had no further issues.

Discussion

VVFs are rare but challenging complications that can occur after gynecological surgeries such as hysterectomy. Their management typically involves surgical repair, often with the use of ureteral stents to facilitate healing and maintain urinary drainage. While double-J stents are a widely used and effective tool in urological practice, their placement is not without risks. This case underscores a rare and potentially life-threatening complication of stent misplacement into the inferior vena cava (IVC) [3].

Misplacement of a double-J stent into the IVC is an exceedingly rare occurrence, with only a few cases reported in literature. In a similar case described by Smith *et al.* (2023), a double-J stent migrated into the IVC owing to excessive force during placement. Our case, however, highlights a different mechanism—altered ureteral anatomy post-hysterectomy, leading to misplacement during routine insertion. The mechanism of this complication typically involves inadvertent entry of the guidewire or stent into a vascular structure during attempts to cannulate the ureter. Factors contributing to such misplacement may include distorted anatomy due to prior surgeries, inflammation, or poor visibility during the procedure [4].

In this case, the initial difficulty in stent placement and the subsequent CT findings demonstrating proximal migration of the stent into the heart highlight the importance of careful intraoperative technique and prompt postoperative imaging when complications are suspected. Misplacement into the IVC poses significant risks, including thrombosis, embolism, or cardiac complications. However, timely diagnosis and a multidisciplinary approach ensured successful management without adverse outcomes [5].

The surgical management in this case involved a coordinated effort between urologists, general surgeons, and a vascular surgery team. The decision to use laparotomy for stent removal and ureteral reimplantation reflects the need for individualized treatment plans based on the patient's condition and anatomical considerations [6]. The use of ureteroscopic retrieval of the stent from the IVC without complications further highlights the importance of advanced endoscopic techniques in such scenarios.

This case also emphasizes the need for vigilance during urological procedures, particularly in complex cases where distorted anatomy may increase the risk of complications. Preoperative imaging and intraoperative fluoroscopy could potentially reduce the risk of such misplacements. Additionally, maintaining a high index of suspicion and obtaining timely imaging when postoperative complications arise are crucial for prompt diagnosis and management.

In conclusion, this case serves as a reminder of the rare but serious complications associated with ureteral stenting and underscores the importance of meticulous surgical technique, prompt recognition of complications, and a multidisciplinary approach for optimal patient outcomes.

Family and psychosocial history

The patient had no significant family history of urological or gynecological disorders. She is a nonsmoker, does not consume alcohol, and reports no occupational exposure to toxins or chemicals. Psychosocially, the patient lives in a supportive family environment, which facilitated her recovery.

Physical examination

On admission, the patient was hemodynamically stable. A pelvic examination revealed watery discharge from the vaginal canal. There were no signs of infection, and her abdomen was nontender. Laboratory findings on admission included a white blood cell (WBC) count of 17,000/μL, indicating a possible inflammatory or infectious process. Renal function tests were within normal limits.

Diagnostic challenges

The initial misplacement of the double-J stent was likely due to altered anatomy from the previous hysterectomy, making visualization of the ureteral anatomy difficult. Additionally, intraoperative imaging was not performed, delaying the recognition of stent misplacement until postoperative imaging.

Discussion and conclusion

VVFs are rare but challenging complications that can occur after gynecological surgeries such as hysterectomy. Their management typically involves surgical repair, often with the use of ureteral stents to facilitate healing and maintain urinary drainage. Double-J stents are commonly used in urological practice; their misplacement into vascular structures, such as the IVC, is exceedingly rare and requires prompt identification and corrective measures.

In this case, the misplacement of the double-J stent into the IVC was an unexpected and serious complication. Several factors may have contributed to this event, including altered anatomical landmarks following the hysterectomy and limited intraoperative imaging guidance. The absence of an ultrasound examination as part of the initial workup represents a diagnostic challenge, as

it could have helped confirm ureteral integrity and stent placement at an earlier stage.

The surgical management of this case involved a coordinated, multidisciplinary effort. A general surgeon assisted in gaining abdominal access, while two urologists performed the ureteral reimplantation. A vascular surgeon was present to manage any potential IVC bleeding, although no vascular injury occurred. This case underscores the importance of a collaborative approach in managing complex surgical complications.

This case also highlights the role of postoperative imaging in detecting complications. The migration of the double-J stent into the heart was confirmed by CT imaging, emphasizing the need for early imaging when unexpected difficulties arise during ureteral stent placement.

Urologists and surgeons must remain vigilant for such rare complications and adopt a collaborative approach when managing challenging cases to minimize risks and improve patient outcomes. This case further illustrates the importance of adaptability in surgical decision-making and the critical role of expertise in advanced urological procedures [7].

Limitations

This case report is limited by the lack of intraoperative fluoroscopy, which could have facilitated earlier recognition of stent misplacement. Additionally, ultrasound was not utilized as part of the initial diagnostic approach, which may have provided further confirmation of ureteral status and guided early intervention. Future studies should explore the role of routine intraoperative fluoroscopy and preoperative ultrasound in evaluating similar complications.

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Author contributions
Nasibeh Hasani conceptualized the study, wrote the manuscript, and supervised the project. Ahmadreza Haddadi collected patient data and contributed to manuscript writing. Amir Afyouni conceived the study and carried out surgical therapy for the patient.

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Availability of data and materials
All relevant data supporting the findings of this case report are included in the manuscript and accompanying figures. Additional clinical details and imaging data are available from the corresponding author upon reasonable request and with appropriate institutional approval.

Declarations

Ethics approval and consent to participate
This case report was reviewed and approved by the Ethics Committee of Shariati Hospital, Isfahan, Iran. Written informed consent to participate in the study was obtained from the patient.

Intervention adherence and tolerability
The patient adhered to all postoperative recommendations, including follow-up visits and imaging studies. She tolerated the nephrostomy and subsequent surgeries well, with no reported adverse effects or complications during recovery.

Consent for publication
Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests
The authors declare that they have no competing interests.

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References

1. Tzelepis K, Giannakodimos I, Samara AA, Kotanidis C, Tsiapakidou S, Janho M, Koutras A, Sotiriou S. Complex postoperative ureterovaginal and vesicovaginal fistula following a non-oncological hysterectomy: a report of a challenging complication. J Surg Case Rep. 2024;2024(11):rjae692. https://doi.org/10.1093/jscr/rjae692.
2. Prijovic N, Cegar B, Cvetic V, Santric V, Stankovic B, Radojevic J. A misplacement of a ureteral stent into the abdominal aorta: a case report of a rare retrograde ureteral stenting complication. BMC Womens Health. 2022;22(1):458. https://doi.org/10.1186/s12905-022-02049-6.
3. Yang L, Qiu X. Management of inadvertent intracaval placement of JJ stents and intracardiac migration during PCNL: report of 1 extremely rare case. Urol Case Rep. 2020;25(33): 101273. https://doi.org/10.1016/j.eucr.2020.101273.
4. Jendouzi O, Lamghari A, Jamali M, Harchaoui A, Alami M, Ameur A. Knotted double J ureteral stent: a case report and literature review. Pan Afr Med J. 2022;5(43):5. https://doi.org/10.11604/pamj.2022.43.5.34538.
5. Stancheva B, Boneva B, Stankev M, Lukanova D. Navigating postpartum venous thromboembolism: a case of thrombophilia, bleeding complications, and chronic inferior vena cava syndrome. Cureus. 2024;16(10): e71753. https://doi.org/10.7759/cureus.71753.
6. Baetzhold D, Dinerman B, Rutkowski J. Ureteral ligation during robotic-assisted laparoscopic prostatectomy. Cureus. 2024;16(8): e66096. https://doi.org/10.7759/cureus.66096.
7. Andreatta PB, Graybill JC, Bradley MJ, Gross KR, Elster EA, Bowyer MW. Evaluation of urological and gynecological surgeons as force multipliers for mass casualty trauma care. J Trauma Acute Care Surg. 2024;97(2S 1):S74–81. https://doi.org/10.1097/TA.0000000000004389.

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