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Laparoscopic Pyelotomy for Removal of an Entrapped Double-J Stent Above a Radiation-Induced Lumbar Ureteral Stricture: A Case Report

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Abstract **Case Report**

Background: Radiation-induced ureteral strictures are a recognized late complication of pelvic radiotherapy for cervical cancer. Repeated double-J (DJ) stenting is often required for urinary drainage in such patients. Stent malposition with intraluminal entrapment above a tight stricture is rare and may render endoscopic retrieval impossible. ***Case Presentation:*** We report the case of a 54-year-old hypertensive woman treated for cervical cancer with external beam radiotherapy, brachytherapy, and radical surgery. She developed bilateral lumbar ureteral strictures attributed to prior radiation therapy and required periodic bilateral DJ stent exchanges. During a scheduled stent change performed without fluoroscopic guidance, the right DJ stent was malpositioned, with the distal loop forming within the lumbar ureter proximal to a tight stricture rather than in the bladder. Both rigid and flexible ureteroscopy failed to access or retrieve the entrapped stent due to the non-traversable radiation-induced stricture. A second DJ stent was successfully placed to ensure drainage. Given minimal pelvicalyceal dilatation and preserved renal function, percutaneous nephrostomy was deemed inappropriate. Laparoscopic pyelotomy was performed, allowing identification and removal of the malpositioned stent. Postoperative recovery was uneventful, with preserved renal function and resolution of symptoms. ***Conclusion:*** Laparoscopic pyelotomy is a safe and effective minimally invasive option for removal of an entrapped DJ stent when endoscopic and percutaneous approaches are not feasible, particularly in the context of radiation-induced ureteral strictures.
Keywords: Cervical cancer, Radiation-induced ureteral stricture, Double-J stent, Stent malposition, Laparoscopic pyelotomy, Endourology.

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Introduction

Radiation therapy remains a cornerstone in the management of cervical cancer. However, late urological complications, including ureteral strictures, may occur due to ischemic fibrosis and progressive tissue remodeling. Radiation-induced ureteral strictures are typically long, rigid, and poorly vascularized, making endourological management challenging.

The double-J ureteral stent, first described by Finney, is widely used to ensure urinary drainage in obstructive uropathy. Although stent-related complications such as infection, encrustation, and migration are common, intraluminal entrapment above a non-traversable stricture is rarely reported.

We describe a case of a malpositioned DJ stent entrapped proximal to a radiation-induced lumbar ureteral stricture, requiring laparoscopic pyelotomy after failed endoscopic retrieval.

Case Presentation

A 54-year-old woman with a history of hypertension treated with amlodipine had been followed since 2020 for cervical cancer treated with external beam radiotherapy, brachytherapy, and radical surgery. No evidence of tumor recurrence was observed during follow-up.

She subsequently developed bilateral lumbar ureteral strictures attributed to prior pelvic irradiation. Renal function remained normal. Periodic bilateral DJ stent exchanges were performed to maintain urinary drainage.

In October 2025, during a scheduled bilateral stent exchange performed without fluoroscopic guidance, malposition of the right DJ stent occurred. The distal loop failed to reach the bladder and instead formed within the lumbar ureter, proximal to a tight radiation-induced stricture.

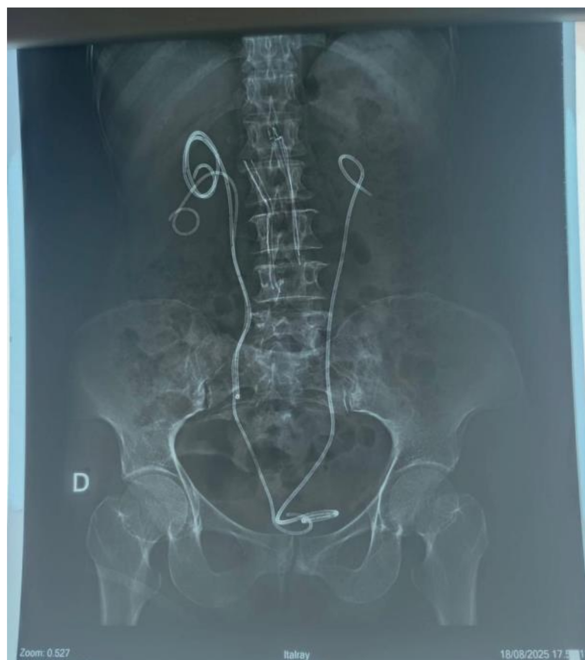

Figure 1: Preoperative KUB x-ray showing the malpositioned DJ stent

Endoscopic Attempts

Rigid ureteroscopy was attempted but failed to traverse the stenotic segment. Flexible ureteroscopy was also unsuccessful due to the severity and rigidity of the stricture. Retrieval of the malpositioned stent was therefore impossible via a retrograde approach.

To maintain drainage, a second DJ stent was successfully inserted.

Imaging and Renal Assessment

Postoperative imaging demonstrated:

- Minimal bilateral pelvicalyceal dilatation
- Normal renal function
- Lumbar ureteral stricture without extravasation

Because of the minimal collecting system dilatation, percutaneous nephrostomy was considered technically inappropriate and potentially unsafe.

Surgical Management

Given the failure of endoscopic retrieval and the lack of indication for percutaneous access, laparoscopic management was elected.

Under general anesthesia, transperitoneal laparoscopy was performed. After identification of the renal pelvis, a longitudinal pyelotomy was carried out. The malpositioned stent—identified by its graduations—was visualized and carefully extracted. The functioning second DJ stent was left in place. The pyelotomy was closed in a watertight fashion.

No intraoperative complications occurred, and conversion to open surgery was not required.

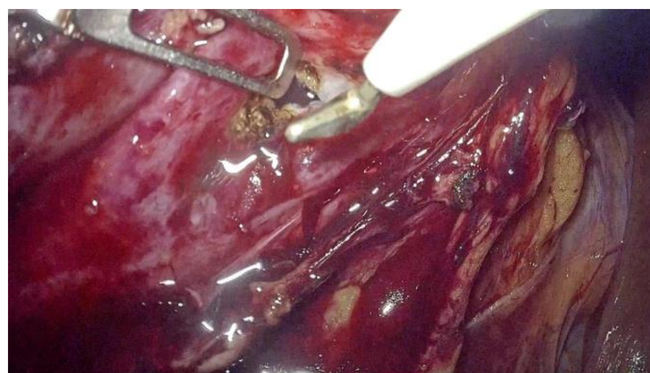

Figure 2: Intraoperative image of the pyelotomy

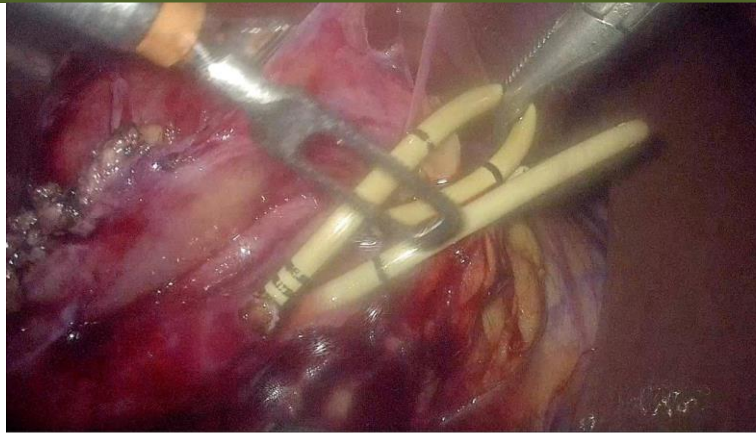

Figure 3: Intraoperative image of the extraction of the malpositioned DJ stent

Postoperative Course

The postoperative course was uneventful:

- Drains were removed without incident
- Normal urine output was maintained
- No lumbar pain occurred
- Renal function remained stable

At follow-up, the patient remained asymptomatic with preserved renal function.

Discussion

Radiation-induced ureteral strictures represent a complex reconstructive challenge. Histopathological changes include:

- Dense fibrosis
- Reduced vascular supply
- Loss of tissue elasticity

These features significantly limit endoscopic maneuverability and increase the risk of procedural complications.

In the present case, the absence of fluoroscopic guidance during stent exchange likely contributed to malposition. In irradiated ureters, blind stent placement carries increased risk due to altered anatomy and rigidity.

Retrograde retrieval failed because the stricture was non-traversable. Antegrade access via percutaneous nephrostomy is often considered in such cases; however, minimal pelvicalyceal dilatation may render percutaneous puncture technically difficult and increase complication risk.

Laparoscopic pyelotomy provided:

- Direct access to the collecting system
- Safe identification of the entrapped stent
- Controlled extraction
- Reduced morbidity compared to open surgery

This minimally invasive approach is particularly suitable when both retrograde and antegrade techniques are contraindicated or unsuccessful.

The case underscores the importance of systematic fluoroscopic guidance during DJ stent exchange, especially in patients with known ureteral strictures following pelvic irradiation.

Conclusion

Entrapment of a double-J stent above a radiation-induced lumbar ureteral stricture is an uncommon but challenging complication. When endoscopic and percutaneous approaches are not feasible, laparoscopic pyelotomy offers a safe and effective minimally invasive alternative. Strict fluoroscopic control during stent placement is strongly recommended in irradiated ureters to prevent such complications.

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