



## Oncology

## Thoughts on diagnosis and treatment of catheter - Related refractory upper urinary tract Bleeding: A case report

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## ABSTRACT

We present an extremely rare case of refractory upper urinary tract bleeding related to a single "J" tube, unreported globally. A patient with high - grade invasive urothelial carcinoma had LRC + bilateral uretero - cutaneous ostomy, then bleeding unresponsive to transfusion and RAE. Recovery came after tube removal, with no hematuria in 2 - month follow - up.

## 1. Introduction

Refractory upper urinary tract bleeding associated with a single "J" tube needs to be carefully differentiated from spontaneous renal hemorrhage (SRH) and idiopathic submucosal bleeding of the renal pelvis (AGL). Clinically, once these two rare diseases are excluded in cases of refractory upper urinary tract bleeding, this condition should be the top consideration.

## 2. Case report

The patient was a 71 - year - old male who underwent laparoscopic radical cystectomy (LRC) plus bilateral uretero - cutaneous ostomy on April 11, 2023. After the surgery, the patient regularly returned to the hospital for the replacement of the single "J" tube. On February 13, 2024, bright - red bloody urine emerged immediately after the replacement of the single "J" tube. Subsequently, hematuria recurred repeatedly and became more severe each time after the replacement of the single "J" tube.

By comparing the CT images before and after the change in the patient's condition, it was observed that hematomas were present in the bilateral renal pelves on the CT scans (Fig. 1a and b). Through comparing the CT values of the hematomas, it was revealed that there had been a long - term co - existence of organized old hematomas and fresh bleeding in the patient's renal pelvis (Fig. 1c), indicating persistent bleeding in the renal pelvis.

On October 31, 2024, the patient was admitted to the hospital due to "hemorrhagic shock" and received a total of 27.5U of blood transfusion and 7U of intermittent platelet transfusion. Regrettably, after three multidisciplinary team (MDT) consultations, no improvement was noted in the intervention measures. Subsequently, a flexible ureteroscopy was conducted. However, due to severe bleeding, the operative field was obscured, making it impossible to accurately identify the cause and location of the bleeding. On November 7, 2024, "bilateral terminal renal artery embolization" was performed, yet no obvious bleeding points were detected during the operation (Fig. 2a and b).

After the operation, there was no significant improvement in the patient's bleeding condition compared with that before the operation. Through the fourth MDT consultation, it was speculated that the single "J" tube was highly likely to be the cause of the upper urinary tract bleeding (Fig. 3a-e). Therefore, the single "J" tube was promptly removed. Surprisingly, no fresh hematuria occurred after the tube removal, and the Hb and platelet (PLT) levels increased steadily (Fig. 4a and b). Since absorbable gelatin sponges were used for embolization during the operation, two weeks after the patient's discharge, the re - examined serum creatinine level decreased significantly to 168  $\mu\text{mol/L}$  (Fig. 4c), and hemodialysis was discontinued.

## 3. Discussion

SRH, also known as Wunderlich syndrome,<sup>1-4</sup> refers to renal bleeding without an obvious source of trauma. The "Lenk triad" is its

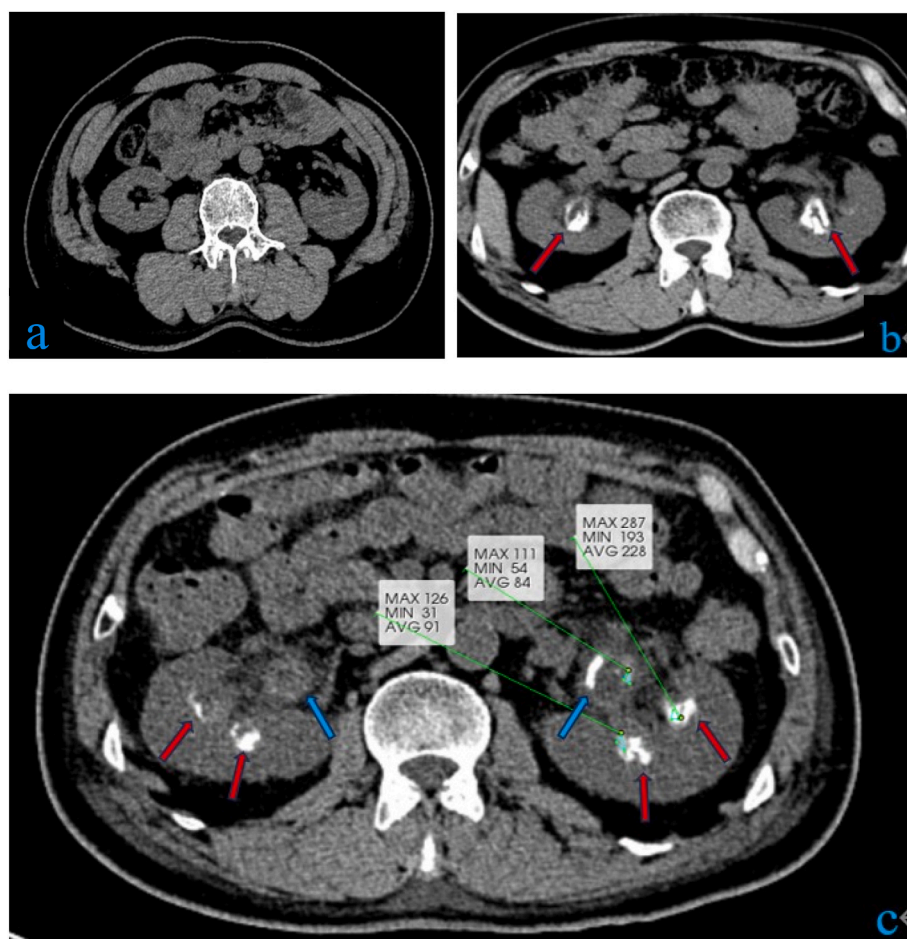
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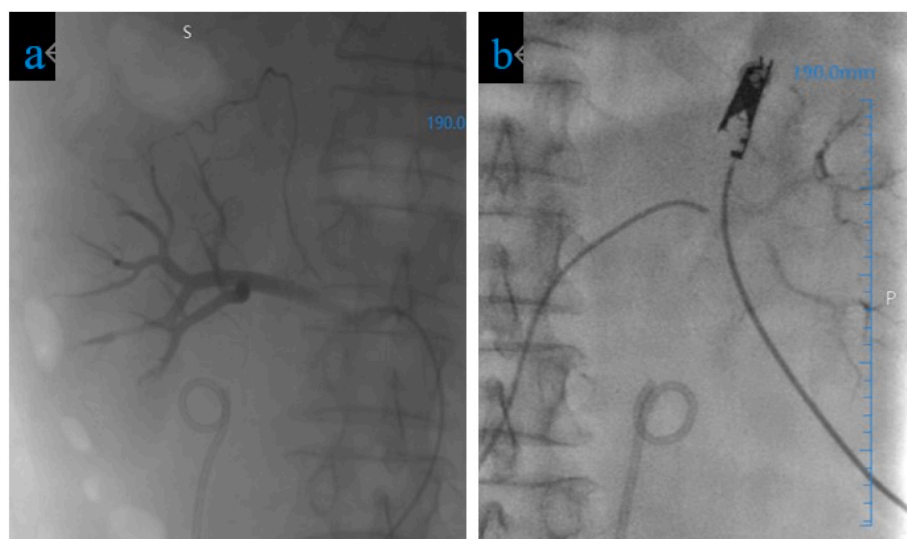
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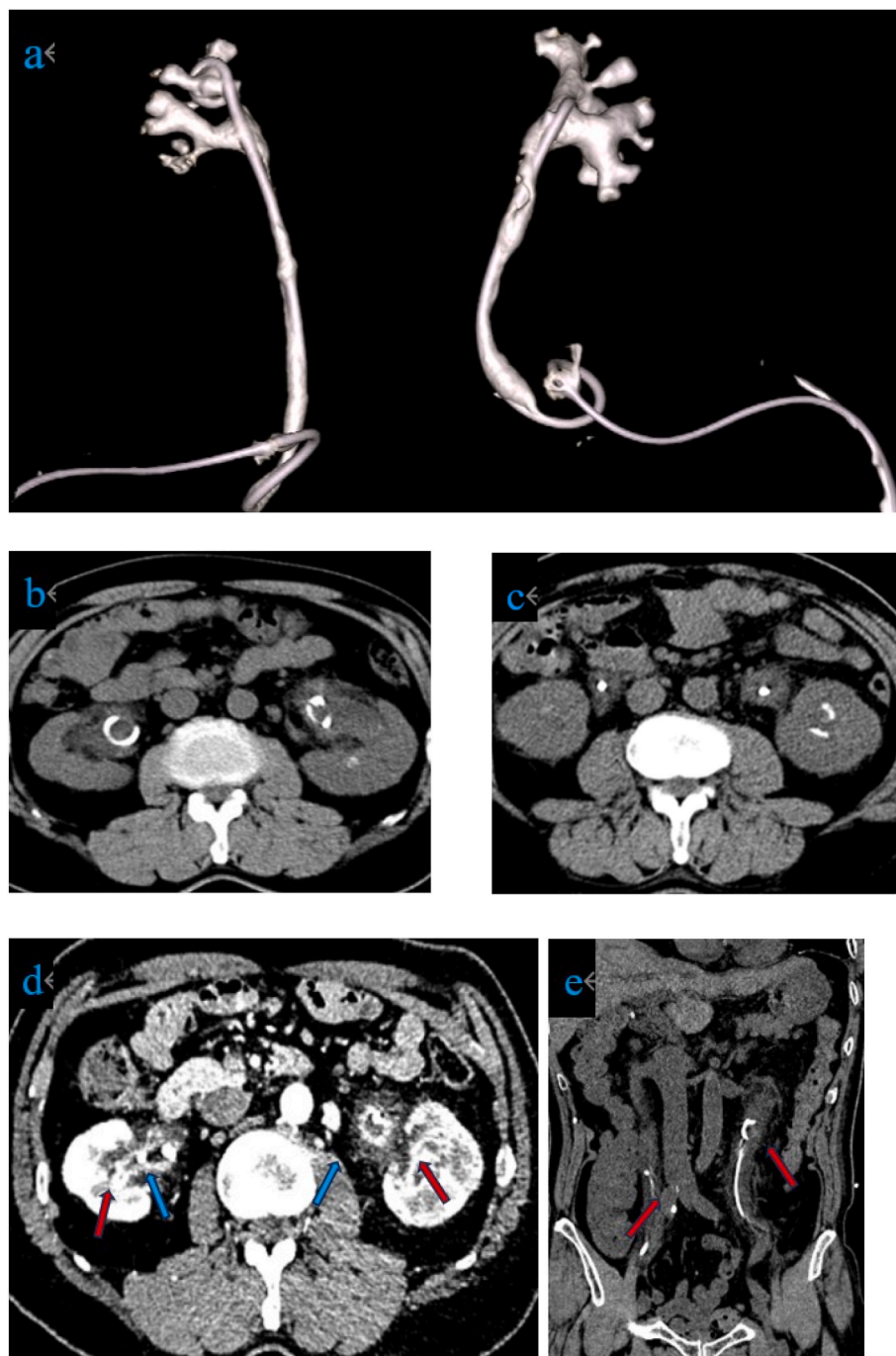
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**Fig. 1.** a. The non - enhanced computed tomography (NCCT) of the patient before the operation showed that the bilateral renal capsules were intact, and there was no obvious bleeding or hydronephrosis in the bilateral renal pelvis. b. Multiple nodular high - density shadows (CT value: 43 - 70Hu) were visible in the bilateral renal pelvis and calyces, which were mostly considered as renal pelvic hematomas with partial organization (indicated by red arrows). c. Multiple tubular and nodular high - density shadows were present in the bilateral renal pelvis and calyces (indicated by red and blue arrows). Considering the CT values of the stones, co - existence of old and new bleeding was suspected. There was infection around the renal pelvis and ureter, and thickening of the tube wall was visible, which might be due to chronic inflammation (indicated by blue arrows).



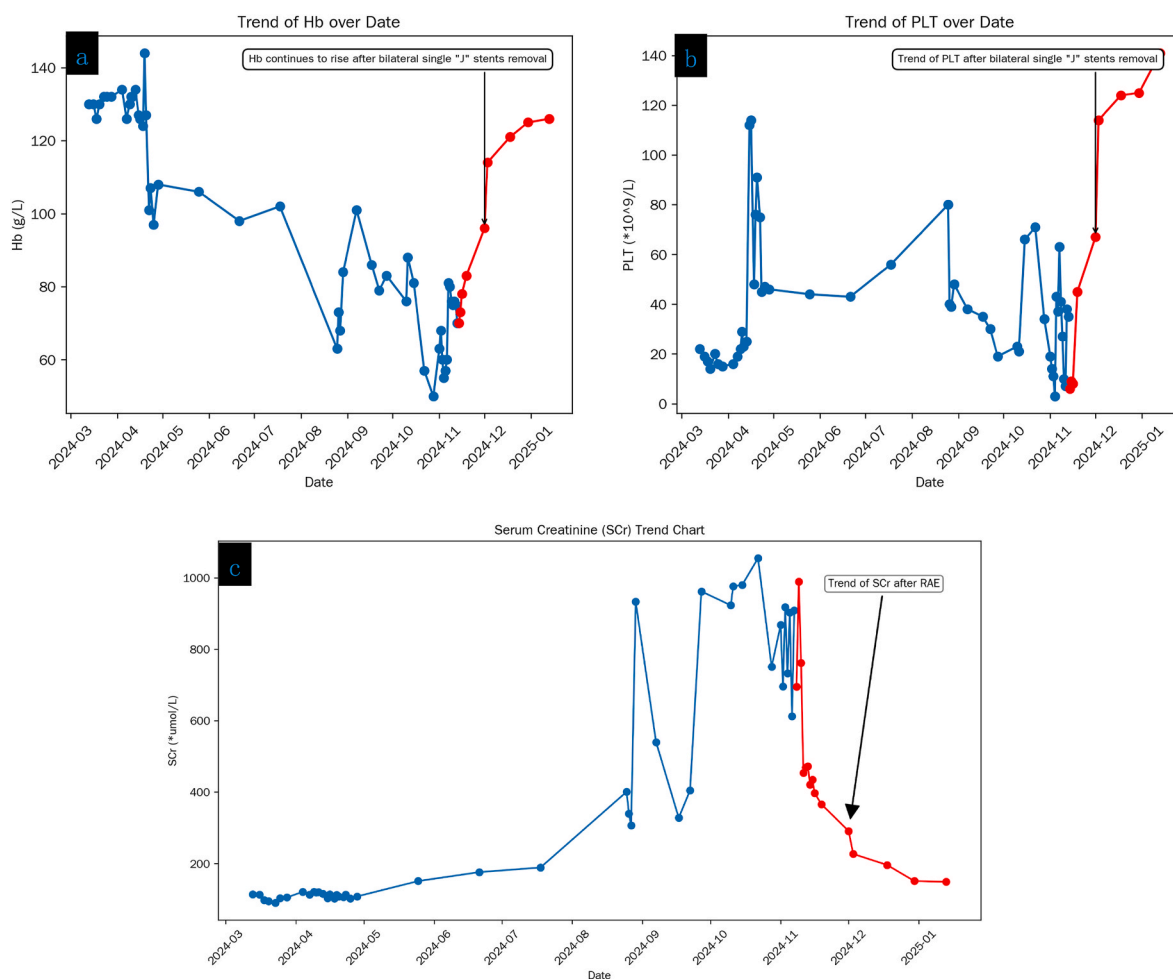
**Fig. 2.** a. No obvious bleeding points were observed during the right renal artery angiography. b. No obvious bleeding points were detected during the left renal artery angiography.



**Fig. 3.** a. One month after the operation, the patient underwent CT urography (CTU), which showed that the bilateral single "J" tubes were in the correct positions and their positions were stable, indicating normal placement within the urinary tract. b. The CT scan two months after the operation showed that the bilateral single "J" tubes were located in the renal pelves, with obvious signs of unobstructed drainage. This was a positive sign of the patient's postoperative recovery. c. The subsequent CT re - examination after the change in the patient's condition showed obvious thickening of the ureteral wall. This morphological change was accompanied by obvious signs of chronic inflammation, as indicated by the blue arrows. These changes might be related to the patient's persistent urinary system condition. d. The enhanced CT image showed obvious thickening and congestion of the bilateral renal pelves and ureteral walls. These were typical manifestations of chronic inflammation, as indicated by the blue arrows. In addition, the organized old hematomas in the renal pelves, as indicated by the red arrows, further revealed the patient's internal pathological state. e. On the coronal plane of the three - dimensional CT scan, it could be observed that the upper end of the single "J" tube had shifted and was now located in the upper segment of the ureter. Meanwhile, the ureteral wall was obviously thickened, as indicated by the red arrows. This shift and thickening might have an impact on the patient's urinary function and subsequent treatment.

typical clinical manifestation, and the most common cause<sup>3</sup> is renal tumors (accounting for 54.0 %), followed by angio-myolipomas (accounting for 40.0 %). Computed tomography (CT) is not only a tool for diagnosing SRH but also can show the extent of renal bleeding (manifested as a high - density area with a CT value of 30 - 80Hu). In addition,

it helps to detect concomitant tumors (CT value < 40Hu). However, in this case, the bleeding site on the CT image of refractory upper urinary tract bleeding associated with a single "J" tube is significantly different from that of SRH, and there is no typical "Lenk triad" manifestation. AGL is described as spontaneous submucosal hematoma or bleeding of the



**Fig. 4.** a. The trend graph of Hb levels before and after the removal of the single "J" stent. b. The trend graph of PLT levels before and after the removal of the single "J" stent. c. The trend graph of serum creatinine (SCr) levels before and after renal artery embolization (RAE).

renal pelvis, which is prone to occur in the renal pelvis or the proximal ureter, and the etiology is still unclear.<sup>5–7</sup> AGL can be clearly diagnosed by flexible ureteroscopy. If hematuria cannot be relieved, super-selective arterial embolization can be attempted. In this patient with refractory upper urinary tract bleeding associated with a single "J" tube, it is difficult to distinguish the CT image and the predilection site of bleeding from those of AGL. However, no abnormalities were found in the patient's bone marrow cytology tests, immunological-related tests, routine coagulation factor tests, and genetic tests, and there were no related predisposing factors, which can be used for preliminary differentiation from AGL.

When it comes to the treatment of refractory upper urinary tract bleeding associated with the single "J" tube, we have gleaned the following two crucial experiences: ① Renal artery embolization (RAE) is generally considered an absolute contraindication for patients with renal failure. However, when confronted with the delicate balance between hemorrhagic shock and the necessity of long-term dialysis, the preservation of life must take precedence. In such critical situations, medical professionals need to be bold and innovative in their decision-making. When selecting embolization materials, absorbable substances are highly recommended. As demonstrated in this particular case, the renal artery can often recanalize over a specific period. Once renal function shows signs of recovery, hemodialysis can be safely discontinued, highlighting the importance of choosing the right embolization material. ② For patients with refractory upper urinary tract bleeding who have an indwelling ureteral stent, if traditional hemostatic treatment modalities prove ineffective, the removal of the ureteral stent

can be a viable option. In the case under consideration, the replacement of the stent tube following the patient's condition deterioration led to persistent and repeated trauma to the renal pelvic mucosa. This continuous injury was a primary contributor to the recurrent bleeding episodes. Moreover, the presence of organized hematoma within the renal pelvis significantly reduced the available space for proper "J" tube placement. As a result, subsequent single "J" tube replacements failed to achieve the optimal position (Fig. 3a and b). Through a detailed analysis of the CT images, it was evident that the tail of the proximal "J" tube was predominantly located in the upper segment of the ureter or below the ureteropelvic junction. This misplacement was a key factor in the development of chronic ureteritis in the patient (Fig. 3c–e). After undergoing RAE, the patient's hematuria initially improved but unfortunately recurred. In contrast, after the bilateral "J" tubes were removed, the hematuria showed a remarkable and sustained improvement until the patient was fully recovered. Concurrently, the ureteritis also gradually subsided.

#### 4. Conclusion

Our case report demonstrates that for clinical cases of catheter-associated refractory upper urinary tract bleeding, accurate diagnosis can be attained by means of CT scans and flexible ureteroscopy. When conventional treatment approaches are ineffective, renal artery embolization (RAE) should not be casually excluded for patients with renal failure. In the event that RAE fails to address the problem, catheter extraction might be the final and potentially efficacious measure.



## CRediT authorship contribution statement

**Chaohua Deng:** Conceptualization, Writing – original draft, Writing – review & editing. **Yuan Zhou:** Data curation, Investigation, Resources. **Guofu He:** Software, Validation, Visualization. **Jiongming Li:** Funding acquisition, Methodology. **Guang Wang:** Project administration, Resources, Supervision. **Yu Zhang:** Writing – review & editing.

## Statement of informed consent

Our study has obtained oral informed consent from patient, and their anonymous information will be published in this article.

## Data availability statement

The datasets used and analyzed in this study are available from the corresponding author upon reasonable request. For data inquiries, please contact us. Due to patient privacy protection, ethical restrictions, etc., the data cannot be publicly accessed. However, we will actively respond to reasonable data requests based on the actual situation and under the premise of complying with relevant regulations and ensuring data security. Patient Data.xlsx

## Statement of human rights

All procedures in this study were carried out strictly in accordance with the relevant regulations of the Hospital Ethics Committee.

## Ethical approval

Our retrospective study has been approved by the Hospital Ethics Committee (see attachment for details). Approval Number: 2025 - 002.

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## Consent for publication statement

On behalf of all the authors of the manuscript titled “Thoughts on

Diagnosis and Treatment of Catheter - Related Refractory Upper Urinary Tract Bleeding:A Case Report”, I hereby confirm that we have read and understood the journal’s policies regarding publication and copyright transfer. We fully authorize the journal to publish the manuscript in all forms, including print and online versions. We also consent to the use of the manuscript’s content in any related promotional materials, indexing services, and electronic databases as required by the journal’s dissemination practices. All authors have been informed and agree to the publication of this work in Urology Case Reports. We are responsible for ensuring that all necessary permissions have been obtained for any third - party materials included in the manuscript.

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## Abbreviations

LRC: laparoscopic radical cystectomy  
RAE: renal artery embolization  
TURBt: transurethral resection of bladder tumor  
PLT: platelet  
Hb: hemoglobin  
KUB: plain film of the kidneys-ureters-bladder  
AGL: antopl goldman-lesion  
SRH: spontaneous renal hemorrhage