

Figure 1. Abdominal X-ray obtained after clinical deterioration showing clots in the right renal collecting system.

tract infection was excluded by negative urine cultures, and imaging showed no evidence of nephrocalcinosis or alternative obstructive etiologies. An urgent CT angiogram showed a hematoma in the right collecting system without active bleeding (Figure 2) and newly detected bone metastases.

The patient developed hematuria immediately after nephrostomy replacement, followed by progressive clot formation leading to impaired drainage. Over the subsequent days, transfusion-dependent anemia developed, and acute kidney injury (creatinine peak 4.56 mg/dl) occurred on day 7 of hospitalization, which prompted urgent intervention. The right nephrostomy appeared obstructed, and the contralateral kidney was atrophic. Vascular Radiology considered a larger nephrostomy tube but deemed it unhelpful. Given the patient's frailty, advanced metastatic disease, and the presence of an atrophic contralateral kidney, invasive alternatives such as nephrostomy exchange or upsizing were considered but were expected to provide limited benefit and carried procedural risks. Apixaban therapy had been temporarily withheld, coagulation parameters were within normal limits, and CT angiography ruled out active arterial bleeding prior to intervention. Given the patient's deterioration and poor prognosis, palliative care was considered, but the family requested all options be exhausted.

On day 8 of hospitalization intraneephrostomy urokinase instillations were initiated: 10,000 IU every 8 hours for 48 hours. After three instillations, the right nephrostomy drained 1,200 ml of urine in 8 hours. Hematuria resolved, diuresis normalized, and no further transfusions were needed. Continuous clinical and hemoglobin monitoring was maintained during treatment to detect potential bleeding complications. Once stabilized, the family agreed to transition to palliative symptomatic treatment. The patient died in December 2024 due to the urinary tract infection.

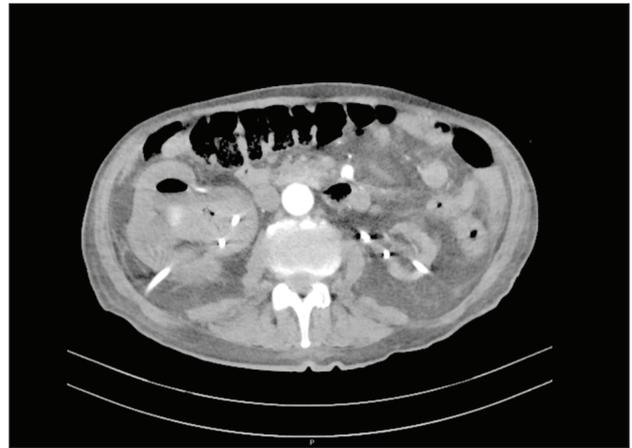


Figure 2. CT angiogram performed prior to urokinase instillation demonstrating clots within the right renal pelvis without evidence of active bleeding.

Discussion

Nephrostomy obstruction by blood clots is a serious complication, especially in patients with gross hematuria or underlying malignancies. It can lead to acute renal failure and requires prompt resolution to preserve kidney function. In cases that are unresponsive to conventional irrigation, fibrinolytic agents represent a potential therapeutic alternative.

Urokinase, a natural human-derived plasminogen activator, promotes fibrinolysis by converting plasminogen into plasmin [1]. Although widely used in thromboembolic conditions, its application in the urinary tract remains rare, and evidence is limited. One of the earliest documented cases was reported by Pautler et al. [4] in 1999, where urokinase was used successfully to declot a nephrostomy tube in a patient with a solitary kidney and urothelial carcinoma. The authors demonstrated restoration of patency after two instillations of 50,000 IU urokinase and emphasized the value of this approach as a temporizing, nephron-sparing strategy in patients with complex comorbidities [4].

More recently, the use of recombinant tissue plasminogen activators such as alteplase has gained attention [5-7]. Mahmoud et al. [8] reported a case of a patient with a solitary kidney who developed renal failure secondary to upper urinary tract obstruction by clots after stent placement. Alteplase was instilled through a nephrostomy tube (10 mg/day for 2 days), resulting in rapid restoration of urine output and renal function, thus avoiding further dialysis. The authors highlighted the importance of assessing hemodynamic stability and coagulation status before instillation to minimize bleeding risks [8].

Similarly, Lin et al. [9] described the successful outpatient use of alteplase in an elderly patient with ureteral obstruction caused by postoperative clot formation following endoscopic lithotripsy. Due to high surgical risk, a protocol of two alteplase instillations over one week was

applied, leading to complete clot dissolution without complications [9].

Potential bleeding sources in our patient included tumor-related hemorrhage, post-procedural bleeding after nephrostomy replacement, and anticoagulation-associated hematuria. Temporary suspension of anticoagulation and the absence of active extravasation on CT angiography supported conservative management with fibrinolytic therapy. The selected regimen of 10,000 IU urokinase every 8 hours for 48 hours was chosen to allow gradual clot dissolution while minimizing bleeding risk. Previously reported urokinase and alteplase protocols show considerable dosing variability, reflecting the absence of standardized regimens and supporting individualized dosing according to clinical risk.

These reports, together with our case, reinforce the potential role of fibrinolytics—both urokinase and alteplase—as effective, minimally invasive tools for resolving nephrostomy tube occlusion due to blood clots. Nonetheless, careful patient selection, close monitoring, and multidisciplinary collaboration are essential to minimize complications and optimize outcomes.

Ultimately, this report has several limitations: it represents a single-patient experience, urokinase use was off-label, and bleeding risk remains a relevant concern. Therefore, this strategy should be reserved for carefully selected patients under multidisciplinary supervision until further evidence becomes available.

Conclusion

Intraneephrostomy urokinase instillation can be a safe and effective method for treating clot-related obstruction in nephrostomy tubes, particularly in palliative patients where other options are limited or invasive.

What is new?

Urokinase can be used safely and effectively to restore patency in nephrostomy tubes obstructed by clots. This case highlights a minimally invasive approach to manage upper tract obstruction in advanced prostate cancer. Fibrinolytic instillation through nephrostomy may be a salvage option when standard irrigation fails.

Conflict of interest

The authors declare no conflict of interest.

Summary of the case

1	Patient (gender, age)	Male, 78 years
2	Final diagnosis	Nephrostomy tube obstruction due to blood clots in advanced prostate cancer
3	Symptoms	Hematuria, nephrostomy dysfunction, acute kidney injury
4	Medications	Red blood cell transfusions, urokinase instillation
5	Clinical procedure	Intraluminal urokinase instillation via nephrostomy tube
6	Specialty	Urology

Funding

None.

Consent for publication

Written informed consent was obtained from next of kin.

Ethical approval

Not required at our institution for anonymous case report.

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