

Acute Kidney Injury With Unilateral Urinoma Secondary To Malignant Ureteral Obstruction in Stage IIIB Cervical Cancer: A Case Report

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ABSTRACT

Objective: Acute kidney injury (AKI) is a common complication in cancer patients and malignant ureteral obstruction (MUO) is one of the most important postrenal complications in the most advanced pelvic malignancies. MUO causes urinoma very rarely reported in the literature. **Case Presentation:** A 38-year-old woman with advanced cervical cancer has developed obstructive acute kidney injury and is on hemodialysis. FIGO stage IIIB cervical cancer has bilateral malignant ureteral obstruction, bilateral hydronephrosis and large left perirenal urinoma. She underwent left double-J stent placement and percutaneous drainage of the urinoma and biopsy showed necrotic inflammatory tissue without malignancy. Despite decompression, renal function was gradually impaired and she was kept on hemodialysis for the next 10 weeks. Ten weeks later she was readmitted with acute-on-chronic kidney disease with severe electrolyte and metabolic complications, anemia and pneumonia in her lungs. Repeat imaging revealed persistent left perirenal urinoma. The patient was treated and had clinical and biochemical improvement. **Conclusion:** Unilateral perirenal urinoma is a rare complication of MUO in advanced cervical cancer patients. Early diagnosis of cancer, appropriate urinary decompression and multidisciplinary management are critical to prevent life-threatening renal complications and to optimise cancer treatment.

Keywords: Acute Kidney Injury, cervical cancer, urinoma, ureteral obstruction.

INTRODUCTION

Acute kidney injury (AKI) is common in cancer patients, with a 1-year incidence of 17.5% in cancer patients and up to 54% in critically ill patients.¹ AKI has a significant impact on morbidity, mortality and the disruption of cancer treatment. Malignant ureteral obstruction (MUO) from direct tumor infiltration or extrinsic pelvic compression is a significant postrenal cause of AKI with cervical cancer being the most common associated tumor.²

Cervical cancer is the fourth most common type of cancer in women worldwide with an estimated 660,000 new cases and 350,000 deaths in 2022.³ FIGO stage IIIB cervical cancer may cause malignant ureteral obstruction through parametrial extension, leading to renal failure and limiting cisplatin-based chemoradiation.^{4,5} Urinoma, an extravasated urine collection due to the failure of the collecting system in a long-term state and sustained intraluminal pressure, is a rare complication of malignant ureteral obstruction and is usually reported only in isolated cases and can further impair renal function and may pose a risk of infection.^{6,7} No prior report has described progression to stage 5 kidney disease requiring emergency hemodialysis in this setting. We report a 38-year-old woman with FIGO stage IIIB cervical cancer complicated by AKI and unilateral perirenal urinoma, progressing to dialysis-dependent renal failure, highlighting the diagnostic challenges of malignant ureteral obstruction.

CASE PRESENTATION

A 38-year-old Indonesian woman with vaginal bleeding for 3 months, worsening abdominal pain and distension, and urinary retention requiring catheterization was found to be in need of treatment for AKI. She had 3 hemodialysis sessions for AKI due to bilateral ureteral obstruction and failed to stent retrograde because of complete tumor obliteration. Cervical biopsy confirmed invasive keratinizing squamous cell carcinoma and she was referred to RSUD Dr. Soetomo, Surabaya.

On admission, she was hemodynamically stable with bilateral pitting edema. Laboratory findings included Hb 8.7 g/dL, WBC 12,100/μL, platelets 604,000/μL, creatinine 5.70 mg/dL, BUN 54 mg/dL, sodium 124 mEq/L, and compensated metabolic acidosis. Leukocyturia, hematuria, and microalbuminuria were observed in urine sample and ultrasonography showed a hypochoic cervical mass (3.4×4.9×5.0 cm), bilateral parametrial extension with grade IV right and grade II left hydronephrosis and large bilateral perirenal fluid collections (right 15.3×10.5×17.3 cm and left 11.9×12.8×18.9 cm) that were initially thought to be bilateral urinomas (Figure 1).

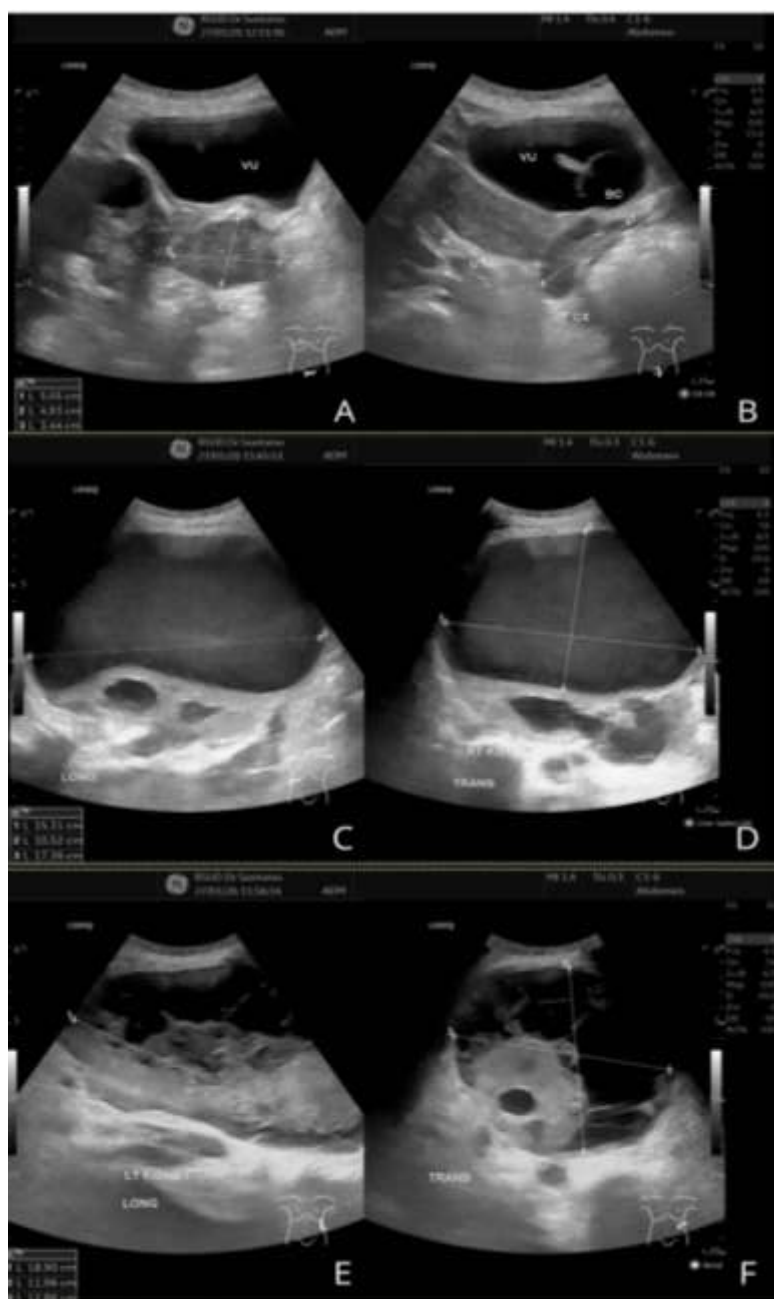


Figure 1. Abdominal ultrasonography. The longitudinal (A) and transverse (B) views show a solid hypoechoic cervical mass of 3.4×4.9×5.0 cm with hydroutereronephrosis (i.e. the lower uterine segment, proximal vagina and bilateral parametria). Right kidney longitudinal (C) and transverse (D) view shows a large anechoic cystic lesion of about 15.3×10.5×17.3 cm with severe grade IV hydronephrosis. Left kidney longitudinal (E) and transverse (F) view shows a large anechoic cystic lesion of about 11.9×12.8×18.9 cm with grade II hydronephrosis.

The next day, the pelvic MRI revealed a heterogeneous cervical mass (4.0×2.4×3.0 cm) with bilateral parametrial invasion, complete distal ureteral obstruction and bilateral hydroureteronephrosis with bilateral inguinal and left para-iliac lymphadenopathy (FIGO stage IIIB (T3bN2M0). MRI also changed the right-sided collection to a Bosniak I simple cyst (13.6×10.9×15.8 cm) while the left perirenal collection (11.4×10.4×16.9 cm) was consistent with urinoma (Figure 2) and only the left-sided collection was a true urinoma, not a bilateral one, as previously considered.

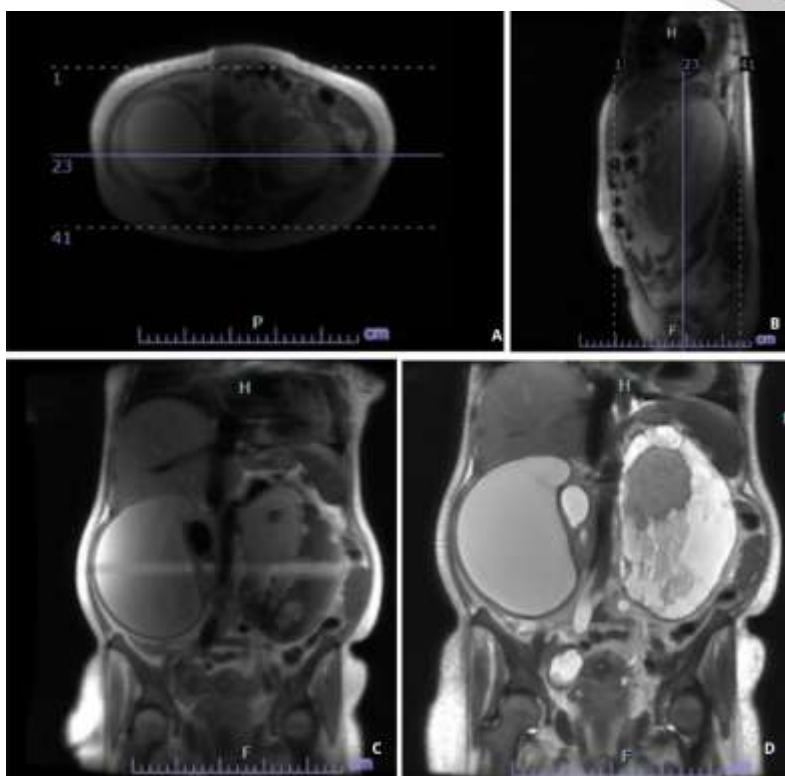


Figure 2. Pelvic MRI shows a malignant cervical mass of about $4.0 \times 2.4 \times 3.0$ cm (AP $\times$ ML $\times$ CC), locally and obstructing both ureters and leading to bilateral hydroureteronephrosis. Bilateral inguinal and left para-iliac lymphadenopathy is also evident, consistent with FIGO stage T3bN2M0 (IIIB). A large left perirenal urinoma ($11.4 \times 10.4 \times 16.9$ cm) and a large right Bosniak I renal cyst ($13.6 \times 10.9 \times 15.8$ cm) are also seen. There are also left endometrioma and bilateral ovarian cysts. (A) Axial. (B) Sagittal. (C) Coronal. (D) Coronal.

One week into admission, left DJ stent insertion and percutaneous drainage of the left perirenal urinoma were performed and biopsy excluded metastatic involvement, histopathology confirmed a benign urinoma. Despite successful decompression, renal function continued to decline (creatinine 7.01 mg/dL by week two) and hemodialysis and multidisciplinary treatment for chemoradiotherapy were recommended.

Ten weeks later, he was readmitted in critical condition with severe weakness, cough and dyspnea. An acute-on-chronic kidney disease stage 5 was observed (creatinine 15.50 mg/dL, BUN 150 mg/dL, eGFR 2.6 mL/min/1.73 m²), life-threatening hyperkalemia (7.3 mEq/L), severe hyponatremia (111.9 mEq/L) and high anion gap metabolic acidosis (pH 7.34). Anemia had deteriorated (Hb 4.7 g/dL) with severe leukocytosis (17,130/ μ L, 88.6% neutrophils) suggesting infection. Chest radiography showed pulmonary edema superimposed on community-acquired pneumonia and ultrasonography confirmed persistent left perirenal urinoma ($9.1 \times 14.7 \times 8.4$ cm) with the DJ stent in situ and right renal cyst ($8.4 \times 11.9 \times 8.7$ cm) (Figure 3).



Figure 3. Abdominal ultrasonography showing a persistent left perirenal urinoma measuring $9.1 \times 14.7 \times 8.4$ cm (A) and a right renal cyst measuring $8.4 \times 11.9 \times 8.7$ cm (B).

Following hemodialysis, packed red cell transfusion and intravenous ceftriaxone, creatinine dropped to 6.12 mg/dL, BUN to 61.6 mg/dL, potassium normalized to 3.6 mEq/L, sodium to 126.4 mEq/L and pH normalized to 7.41. A multidisciplinary team planned radiotherapy as the next definitive oncological step.

DISCUSSION

Unilateral urinoma associated with MUO in cervical cancer is very rare.⁷ After initial ultrasonography, the right-side collection was classified as a Bosniak I renal cyst, while the left-sided collection was classified as a urinoma. This highlights the essential role of MRI for the perirenal fluid collection investigation and diagnosis, thus avoiding misclassification based on initial ultrasonography.

Upper urinary tract obstruction in pelvic malignancies is often due to invasion of tumors or compression of the ureteral wall, and cervical cancer is one of the most frequent cases.² In this patient, bilateral ureteral obliteration produced asymmetric obstructive nephropathy (grade IV right, grade II left), with sustained intraluminal pressure exceeding the tensile threshold of the urothelium and resulting in forniceal rupture on the left, consistent with the pathophysiology of obstructive nephropathy described in the literature.⁸ Analysis of perirenal biopsy was necessary as histopathology showing necrotic inflammatory tissue without malignancy clearly ruled out retroperitoneal tumors and this would have been the main source of treatment of malignant ureteral obstruction.

Despite successful left DJ stent insertion and urinoma drainage, renal function continued to deteriorate, with creatinine increasing from 5.70 to 7.01 mg/dL within two weeks and reaching 15.50 mg/dL at readmission. In retrospect, PCN could have been considered earlier in this case as retrograde stenting had failed and urinary decompression was an alternative treatment to treat malignant ureteral obstruction.⁵ Persistent obstruction may have been a contributing factor for long-term renal dysfunction and dialysis dependency. Additional hemodialysis was needed for serious uremic and metabolic complications including hyperkalemia, hyponatremia, metabolic acidosis and severe anemia that could have occurred.

The renal failure was so severe that conventional cisplatin-based chemoradiation was not possible because renal function was so poor.⁹ However, the benign perirenal collections of the patient offered hope for local tumor control with radiotherapy as long as renal decompression was successful.

This case highlights that long-term renal dysfunction, regardless of the decompression of the kidneys, should be treated early when the retrograde stenting fails, and that in advanced cervical cancer, urological problems are the main determinants of survival and the eligibility of treatment and should be addressed by nephrology and oncology in a joint effort.²

CONCLUSION

Unilateral perirenal urinoma is a rare complication of malignant ureteral obstruction in advanced cervical cancer. Continued renal dysfunction after decompression should be evaluated for urinary extravasation using appropriate imaging. Early identification, timely urinary diversion, and multidisciplinary treatment are critical to maintain renal function and to provide definitive oncologic treatment.

AUTHOR CONTRIBUTION CONFIRMATION

Mamluatul Karimah contributed to conceptualization, methodology, investigation, data curation, formal analysis, writing of the original draft, and writing, review and editing. Artaria Tjempakasari and Decsa Medika Hertanto were involved in the supervision, conceptualization, methodology, validation, and critical review and editing of the manuscript. All authors reviewed and approved the final manuscript and agreed to be responsible for all aspects of the work.

ORIGINAL/UNPUBLISHED STATEMENT

We confirm that this manuscript is an original work and has not been published previously, in whole or in part and is not currently under consideration for publication elsewhere. All authors have approved the manuscript and all agreed to submit it to the journal.

CONFLICT OF INTEREST

None to declare.

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PATIENT CONSENT

The authors state that they have obtained written consent from the patient reported in this article regarding the publication of the information about her that appears in this case report.

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