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Oncology

EBV-positive diffuse large B-cell lymphoma presenting as symptomatic masses in the bladder trigone and unilateral kidney

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A B S T R A C T

Diffuse large B-cell lymphoma (DLBCL) of the genitourinary tract is a rare diagnosis. A 66-year-old male with a history of multiple myeloma and prostate cancer presented with gross hematuria and concern for urinary clot retention. Imaging demonstrated an incidental mass in the left kidney and urinary bladder. Resection of the urinary bladder tumor and biopsy of the kidney revealed Epstein-Barr Virus positive DLBCL. Significant lymphadenopathy was found during staging, and this lymphoma was classified as stage IV. The patient was referred to medical oncology, initiated on chemotherapy, and scheduled for follow up with urology for the renal mass.

1. Introduction

Primary lymphoma of the urinary bladder is a rare condition that can present with hematuria, dysuria, or urinary frequency. It accounts for only 0.2% of extra-nodal lymphomas and <1% of all bladder tumors.[1] Genitourinary lymphomas include mucosa-associated lymphoid tissue (MALT) and, more rarely, diffuse large B-cell lymphoma (DLBCL). DLBCL, a type of non-Hodgkin's lymphoma, is an aggressive, malignant tumor arising in older adults. Due to its low prevalence, DLBCL is lower on the differential of urologists compared to urothelial carcinomas and its subtypes. Here, we discuss a case of DLBCL of the bladder and kidney in a 66-year-old male who presented with gross hematuria and an incidental left renal mass.

2. Case presentation

A 66-year-old male with a past medical history of multiple myeloma, high-risk prostate cancer with PSA 0.23 ng/mL, nephrolithiasis, and vertebral fracture presented to an outside facility for gross hematuria and recurrent left-sided flank pain. The patient is on monthly bortezomib for multiple myeloma (diagnosed seven years prior) and is status-post radiation therapy and androgen deprivation therapy for high-risk prostate cancer (diagnosed two years prior). He had been treated for chronic prostatitis with multiple antibiotic regimens for the past month due to fatigue, weakness, and chills. This patient sought further medical care after extreme weakness caused an inability to perform activities of daily living for two days. He was found to be hypertensive, bradycardic, and afebrile and was transferred to our institution for hemodialysis due to acute renal failure and electrolyte derangements. The patient voiced no family history of genitourinary cancers and had no personal history of tobacco use or workplace exposures.

Computed tomography (CT) of the abdomen and pelvis without IV contrast showed distention of the urinary bladder secondary to a mass or blood clots, a left renal mass, inguinal lymphadenopathy, and a right distal ureteral calculus (Fig. 1). Upon admission, urology was consulted for gross hematuria with clot retention. A three-way foley catheter was placed with manual irrigation, and continuous bladder irrigation was initiated. Due to his decreased renal function, the patient was initiated on emergent hemodialysis. Interventional radiology placed a right percutaneous nephrostomy tube due to hydronephrosis from distal ureteral obstruction.

The patient then underwent rigid cystourethroscopy with approximately 500 cc of clot evacuation from the bladder. A large mass was identified at the trigone and extended up the right lateral wall with some papillary elements mixed with clot and calcifications (Fig. 2). The patient underwent subsequent bipolar transurethral resection of bladder tumor and bladder neck. The tumor was resected until muscle fibers were present. Follow up renal ultrasound demonstrated left-sided hydronephrosis prompting interventional radiology consult for left percutaneous nephrostomy tube placement, and biopsy of the left lower

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pole renal mass.

Surgical pathology of the resected bladder mass demonstrated Epstein-Barr Virus (EBV)-positive DLBCL (Fig. 3). Immunohistochemistry of the sample was positive for PAX5, CD20, CD30, MUM1, c-Myc, BCL6, BCL2, and CD43 (weak). Similarly, EBV-positive DLBCL was diagnosed in the left kidney lower pole mass biopsy and immunohistochemistry was positive for PAX5 and CD20 (Fig. 3). Fluorescence in situ hybridization (FISH) showed an abnormal B-cell lymphoma with 20% of cells with a *BCL6* loss and 35% of cells with a *MYC* gain.

Staging was performed with CT chest and neck, which demonstrated significant lymphadenopathy including supraclavicular, mediastinal, hilar, and axial lymph nodes. PET CT scan showed hypermetabolic regions in left supraclavicular region; bilateral cervical, subcarinal, retroperitoneal, and pelvic lymph nodes; spleen, lower pole of left kidney, prostate gland, urinary bladder base, and seminal vesicles. The final diagnosis was stage IV EBV-positive DLBCL.

The patient was referred to medical oncology and chemotherapy was initiated with rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP). He is scheduled for bilateral percutaneous nephrostomy tube exchange every 10–12 weeks with interventional radiology and will follow up in the urology clinic at 6 weeks. He was doing well at discharge on hospital day twelve, and his creatinine had improved to 1.45 mg/dL from 12.5 mg/dL at admission. He has currently received two cycles of chemotherapy.

3. Discussion

Lymphoma of the bladder is a rare condition accounting for <1% of urinary bladder tumors. Low-grade tumors are often MALT lymphoma (~86%), while high-grade tumors are typically DLBCL (~80%).[2] First line therapy for DLBCL typically involves chemotherapy with or without radiation or surgery. These chemotherapeutic agents are CHOP or R-CHOP.[2]

A study by Liu et al. considered the origin of DLBCL in the urinary tract and found that nearly 75% originated in the kidney, while 25% originated in the urinary bladder.[3] The origin of our patient's tumor is unclear, but he had two large masses growing simultaneously in the left kidney and urinary bladder. A case report by Min et al. reports the occurrence DLBCL arising in the kidneys, ureteral tract, and urinary bladder.[4] Therefore, our patient's presentation with DLBCL simultaneously in the urinary bladder and left kidney is unique given the rarity of disease and multifocal growth.

Appropriate immunohistochemical staining and FISH testing was performed in this patient.[2] The pathology was positive for CD20 and CD30, which indicate a high-grade lymphoma.[2] Ultimately, our patient was diagnosed with stage IV DLBCL. His most significant risk factor was previous radiation therapy. Unsurprisingly, stage IV disease and patients over the age of 75 years have a worse prognosis.[3] While the bladder tumor was resected prior to final diagnosis, the remainder of his cancer is currently being treated with chemotherapy.

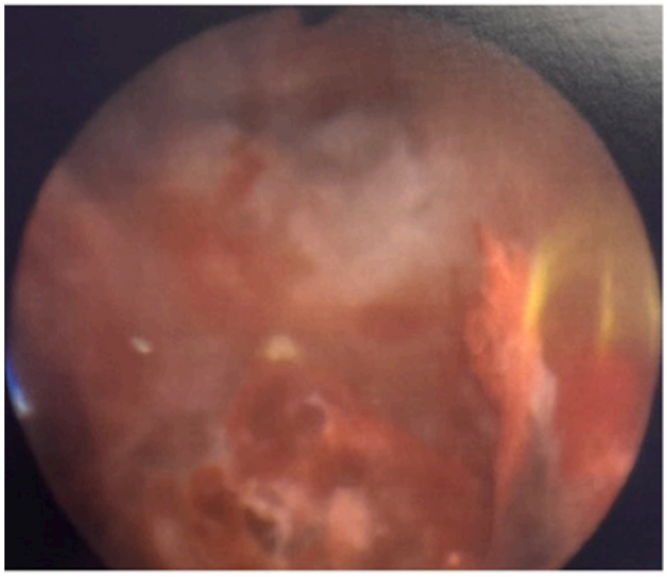

Fig. 2. Cystoscopy image of urinary bladder mass on right lateral wall prior to transurethral resection of bladder tumor.

Lokeshwar et al. presents a case of DLBCL in the urinary bladder causing lower urinary tract symptoms.[5] While this patient had dysuria, nocturia, and frequency, our patient presented with gross hematuria and flank pain. As suggested, having high suspicion for atypical malignancy in the setting of multiple new genitourinary masses can trigger rapid appropriate imaging, biopsy, and referral to medical oncology.[5]

4. Conclusion

DLBCL is a rare cause of malignancy in the genitourinary tract, but can present in several genitourinary organs simultaneously. Presentation can mimic other urologic conditions such as nephrolithiasis and primary localized urothelial carcinoma, so a high degree of clinical suspicion is needed to initiate appropriate medical therapy.

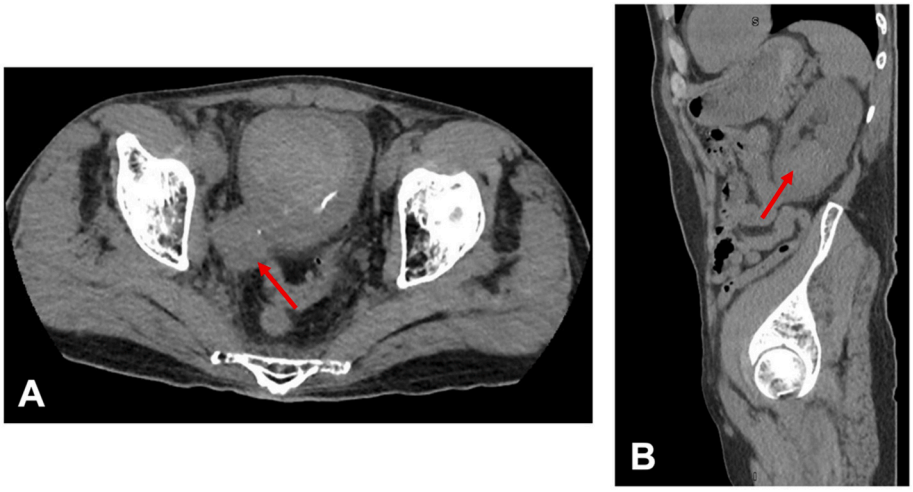

Fig. 1. CT abdomen pelvis without IV contrast showing A) urinary bladder mass in axial view and B) left inferior pole renal mass in sagittal view.

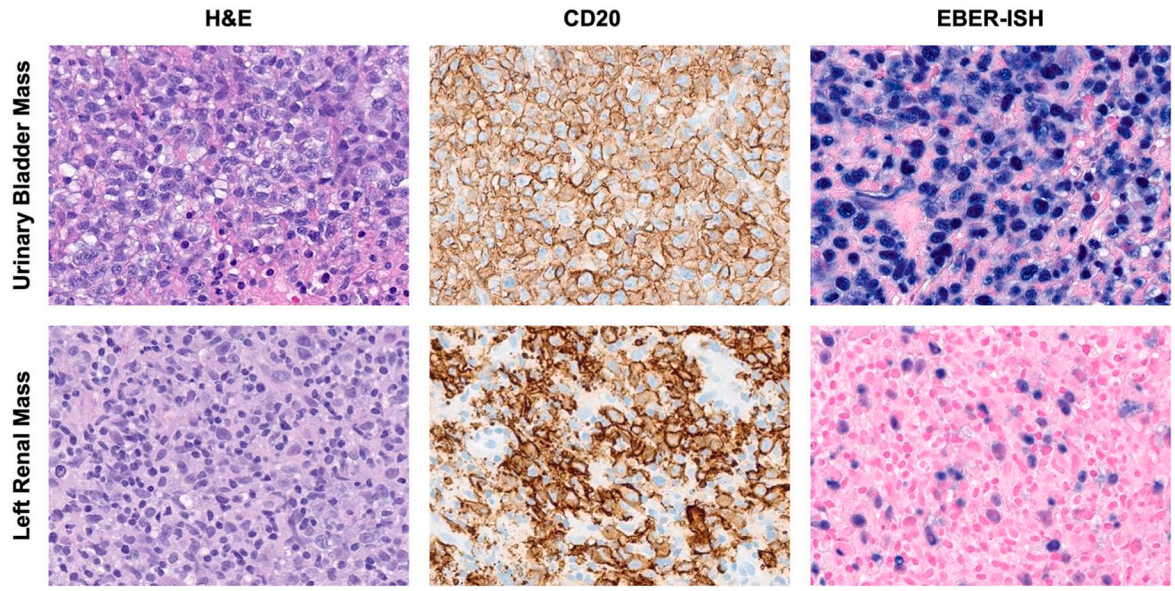

Fig. 3. Histologic imaging of the urinary bladder mass (top images) and left renal mass (bottom images) with H&E staining (20x), CD20 staining immunohistochemistry (20x), and EBV-encoded RNA in situ hybridization staining (20x).

Declaration of competing interest

The authors declare that they have no conflicts of interest to disclose.

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