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Primary Diffuse Large B-cell Lymphoma of the Urinary Bladder Presenting With Obstructive Uropathy: A Case Report

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Abstract

Primary lymphoma of the urinary bladder is a rare extranodal malignancy, and diffuse large B-cell lymphoma (DLBCL) represents one of its main aggressive histological subtypes. Its clinical and radiological presentation may mimic urothelial or gynecological malignancies, making histopathological examination essential for diagnosis. We report the case of a 93-year-old woman with a history of breast cancer who presented with acute kidney injury on chronic kidney disease secondary to right-sided urinary obstruction. Computed tomography (CT) revealed a 42-mm right pelvic mass adjacent to the right ureter with associated ureterohydronephrosis. Retrograde ureteral stenting was unsuccessful. Cystoscopy demonstrated a bladder mass involving the bladder floor, with inability to identify the right ureteral orifice, and biopsies were obtained. Histological examination revealed a diffuse proliferation of large atypical lymphoid cells with centroblastic morphology. The tumor cells expressed CD20, BCL2, CD10, and BCL6, while MUM1 and CD30 were negative. C-MYC was expressed in approximately 40% of tumor cells, and the Ki-67 proliferation index was approximately 70%. Epstein-Barr virus-encoded RNA was not detected. Thoraco-abdominopelvic CT showed no additional nodal or extranodal involvement, supporting a primary bladder origin. The final diagnosis was primary bladder DLBCL with a germinal-center B-cell phenotype. No lymphoma-directed treatment was initiated because the patient died before specific therapy could be started. This case highlights an unusual presentation of primary bladder lymphoma through obstructive uropathy and renal dysfunction rather than hematuria.

Categories: Urology
Keywords: diffuse large b-cell lymphoma, extranodal lymphoma, hydronephrosis, obstructive uropathy, primary bladder lymphoma, urinary bladder

Introduction

Primary lymphoma of the urinary bladder is defined as a lymphoma initially arising in the bladder, without evidence of nodal or extranodal lymphomatous involvement at other sites. It is exceptionally rare, accounting for less than 0.2% of extranodal non-Hodgkin lymphomas and less than 1% of bladder malignancies. This rarity is largely explained by the paucity of native lymphoid tissue in the bladder wall. Diffuse large B-cell lymphoma (DLBCL) is an aggressive subtype of non-Hodgkin lymphoma characterized by a diffuse proliferation of large atypical B cells; it is the predominant aggressive subtype of primary bladder lymphoma. Secondary bladder involvement by systemic lymphoma is substantially more common and must be excluded before a primary bladder origin can be established [1-3].

The clinical and radiological presentation of bladder lymphoma may mimic urothelial or gynecological malignancies, making histopathological and immunohistochemical confirmation essential. Hematuria is among the most common presenting manifestations, while dysuria, urinary frequency, urgency, and recurrent urinary tract infections have also been described [2-5]. However, atypical presentations, including urinary obstruction, hydronephrosis, and renal dysfunction, may occur and may initially suggest a more common urological or pelvic malignancy. In such cases, lymphoma may not be considered early in the differential diagnosis, potentially delaying appropriate diagnostic and therapeutic management [2-5].

This case is clinically relevant because it describes primary bladder DLBCL in a very elderly patient presenting with obstructive uropathy and acute kidney injury, without hematuria. The case illustrates the diagnostic challenge posed by bladder lymphoma, the importance of histological confirmation, and the need to consider lymphoma in the differential diagnosis of atypical bladder and pelvic masses. It also highlights the practical challenges of staging and treatment decision-making in frail, very elderly patients.

Case Presentation

A 93-year-old nulligravid woman with a history of breast cancer was admitted for acute kidney injury

superimposed on chronic kidney disease in the context of right-sided urinary obstruction. Her symptoms had been evolving for more than six months. She was conscious, hemodynamically stable, and apyretic. Her vital signs were as follows: heart rate 93 beats/minute, respiratory rate 20 breaths/minute, and blood pressure 110/60 mmHg. Physical examination revealed right lumbar pain and tenderness, with a negative Giordano sign and pain radiating to the hypogastrium. Hypogastric tenderness was also noted. She reported no gross hematuria.

The previous breast cancer was clinically relevant to the differential diagnosis of the pelvic mass. The patient was admitted on April 4, 2025, and abdominopelvic computed tomography (CT), cystoscopy, and bladder biopsy were performed on the same day. The histopathological results were available on April 16, 2025. The exact date of death was not documented. At the one-month follow-up visit, the patient did not attend; a letter sent to her primary care physician confirmed that she had died.

Laboratory investigations showed impaired renal function, with serum creatinine of 45 mg/L and an estimated glomerular filtration rate of 9 mL/minute/1.73 m^2. After intravenous hydration and correction of electrolyte abnormalities, serum creatinine decreased to 25 mg/L, with an estimated glomerular filtration rate increasing to 17 mL/minute/1.73 m^2. Electrolyte disturbances included severe hyponatremia (sodium 120 mmol/L), hyperkalemia (potassium 5.4 mmol/L), hypochloremia (chloride 98 mmol/L), and mild metabolic acidosis (bicarbonate 21 mmol/L). Serum calcium was 90 mg/L, and serum phosphate was 1 mmol/L. Hemoglobin was 12 g/dL, leukocyte count was 9,230/mm^3, neutrophil count was 4,300/mm^3, and platelet count was 250,000/mm^3. C-reactive protein was 15 mg/L. Liver function tests were normal. Urinalysis findings were not available. However, urine culture was sterile. Serum lactate dehydrogenase was elevated at 460 U/L. The patient's baseline chronic kidney disease was not further characterized in the available medical record. Noncontrast abdominopelvic CT revealed dilatation of the right renal collecting system associated with a 42-mm pelvic mass in close contact with the right ureter. Possible involvement of the right obturator musculature was also described (Figure *1*).

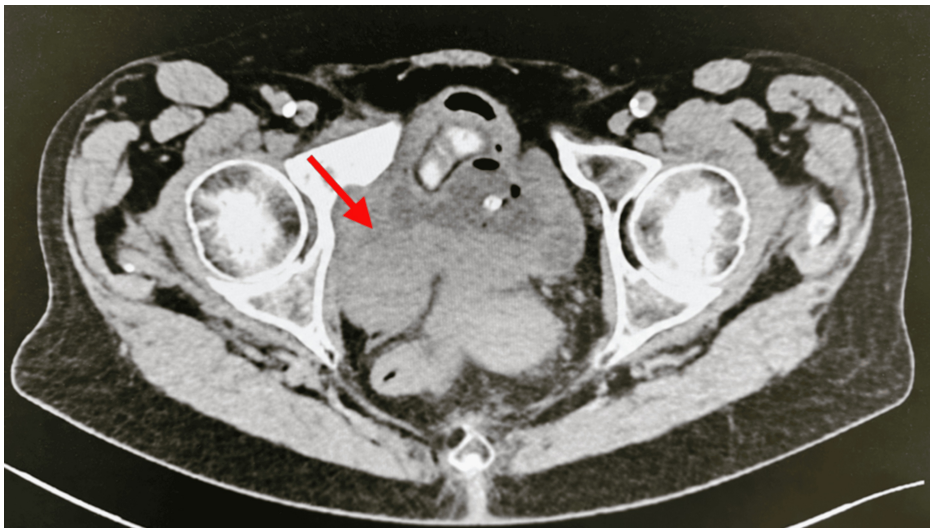


FIGURE 1: Axial noncontrast computed tomography scan showing a right-sided pelvic soft-tissue mass

The arrow identifies the 42-mm lobulated right pelvic soft-tissue mass, closely related to the right ureter. The mass is associated with right-sided urinary obstruction and dilatation of the right renal collecting system

Retrograde ureteral stenting was unsuccessful. Cystoscopy demonstrated a bladder mass involving the bladder floor, with inability to identify the right ureteral orifice, and biopsies were obtained. Intravenous hydration and correction of electrolyte abnormalities resulted in partial improvement of renal function, with serum creatinine decreasing from 45 to 25 mg/L and the estimated glomerular filtration rate increasing from 9 to 17 mL/minute/1.73 m^2. Because of the pelvic location of the mass, gynecological assessment was performed. Vaginal examination revealed a firm pelvic mass with cervical induration. Pelvic ultrasonography was inconclusive.

Histopathological examination of the bladder biopsy specimens showed extensive infiltration by a diffuse malignant lymphoid proliferation predominantly composed of large cells with centroblastic morphology. No plasmacytic differentiation or tumor necrosis was identified (Figure *2*).

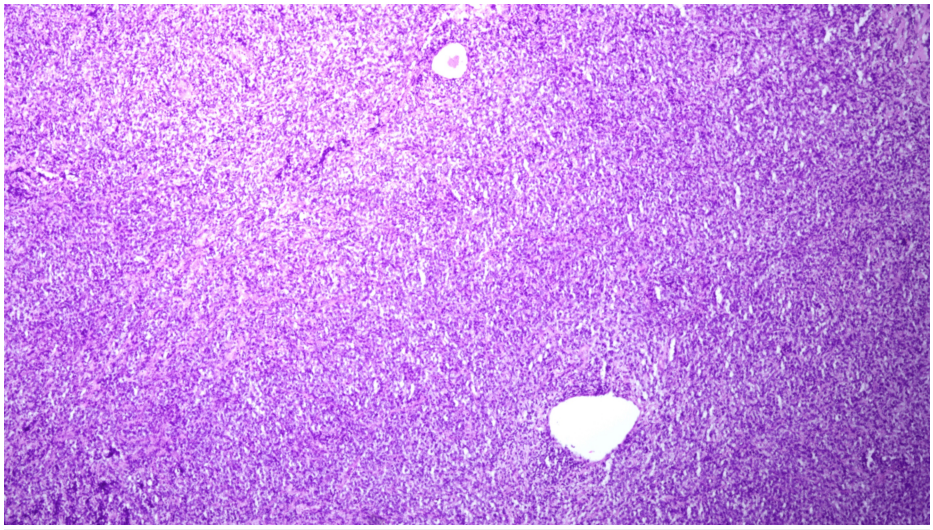


FIGURE 2: Histopathological appearance of the bladder lesion on hematoxylin and eosin staining

Low-power view (hematoxylin and eosin, ×5) showing a dense and diffuse lymphoid infiltrate extensively involving the bladder tissue, with loss of normal architecture. The infiltrate is predominantly composed of large atypical lymphoid cells with centroblastic morphology. No plasmacytic differentiation or tumor necrosis is identified

Immunohistochemical staining showed strong CD20 expression (Figure *3*), confirming B-cell lineage. The neoplastic cells also expressed BCL2. CD10 and BCL6 were diffusely expressed, while MUM1 was negative, corresponding to a germinal-center B-cell phenotype according to the Hans algorithm. CD30 was negative. C-MYC was expressed in approximately 40% of tumor cells.

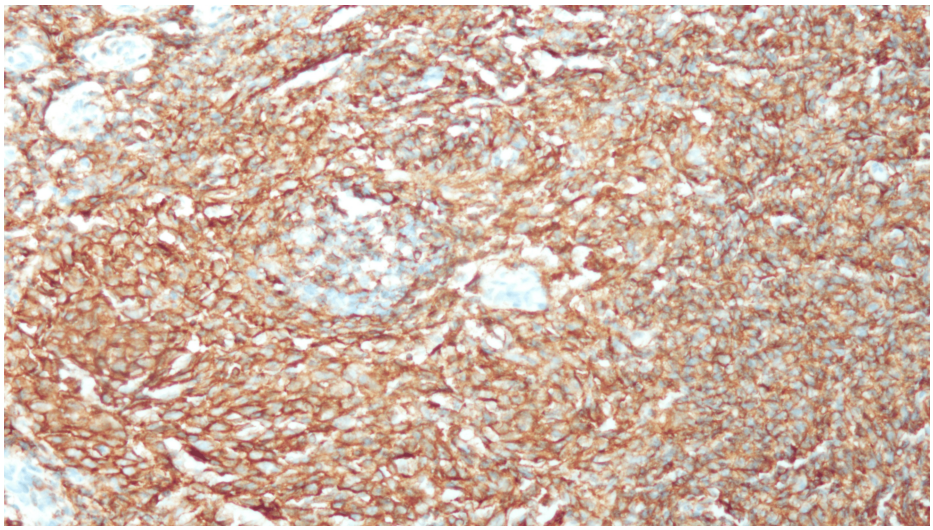


FIGURE 3: CD20 immunohistochemical staining

Immunohistochemical staining for CD20 (magnification: ×20) shows strong and diffuse membranous positivity in the neoplastic lymphoid cells, confirming B-cell lineage

The Ki-67 proliferation index was approximately 70% (Figure *4*). In situ hybridization for Epstein-Barr virus-encoded RNA was negative. Taken together, the morphological and immunophenotypic findings were consistent with DLBCL with a germinal-center B-cell phenotype (Table *1*).

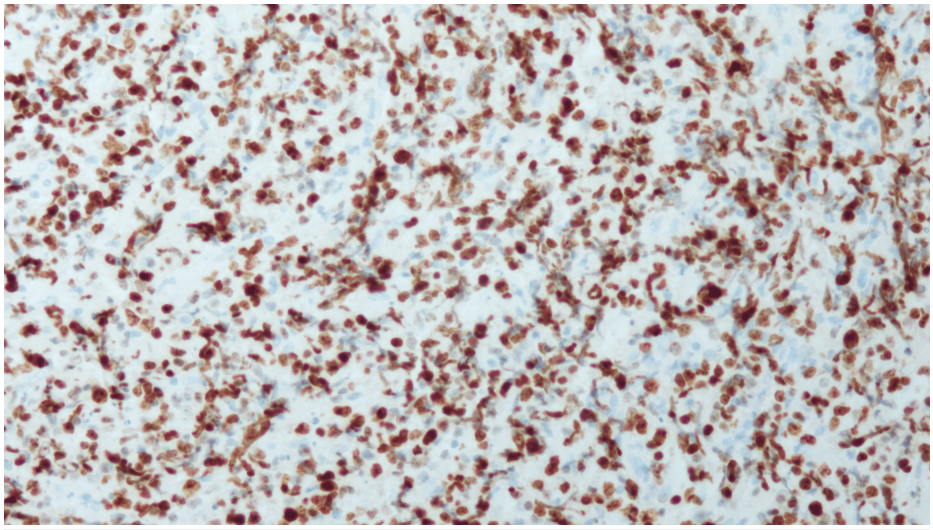


FIGURE 4: Ki-67 immunohistochemical staining showing a high proliferative index

Ki-67 immunohistochemistry (magnification: ×20) demonstrates nuclear staining in approximately 70% of the neoplastic lymphoid cells, indicating high proliferative activity consistent with diffuse large B-cell lymphoma

Marker	Result	Diagnostic interpretation
CD20	Strong and diffuse membranous positivity	Confirms B-cell lineage
BCL2	Positive	Supports B-cell lymphoma; not specific for DLBCL
CD10	Diffuse positivity	Supports germinal-center B-cell phenotype
BCL6	Diffuse positivity	Supports germinal-center B-cell phenotype
MUM1	Negative	Supports germinal-center B-cell phenotype according to the Hans algorithm
CD30	Negative	Does not support classical Hodgkin lymphoma or anaplastic large-cell lymphoma
C-MYC	Positive in approximately 40% of tumor cells	Should be interpreted with caution; does not establish MYC rearrangement
Ki-67	Approximately 70%	Indicates high proliferative activity, consistent with DLBCL
EBER in situ hybridization	Negative	Does not support EBV-associated lymphoma

TABLE 1: Immunohistochemical findings and diagnostic interpretation

Taken together, the morphological and immunophenotypic findings were consistent with DLBCL with a germinal-center B-cell phenotype

EBER: Epstein-Barr virus-encoded RNA; DLBCL: diffuse large B-cell lymphoma; EBV: Epstein-Barr virus

A thoraco-abdominopelvic CT scan showed no additional nodal or extranodal lesions suggestive of secondary lymphomatous involvement (Figure *5*). Fluorodeoxyglucose-positron emission tomography (FDG-PET)/CT was not performed because it was not available at our institution and could not be accessed externally because of financial constraints. Cytogenetic testing, including fluorescence in situ hybridization for MYC, BCL2, and BCL6 rearrangements, was not performed because of limited local availability and financial constraints. In the absence of disease at another site, the bladder was considered the primary site of lymphoma, supporting the diagnosis of primary DLBCL of the urinary bladder. No lymphoma-directed treatment was initiated because the patient died before specific therapy could be started. The interval

between histopathological diagnosis and death was not precisely documented in the available medical record. The documented cause of death was not available. Consequently, treatment response and lymphoma-specific outcome could not be assessed.



FIGURE 5: Coronal reconstruction of abdominopelvic computed tomography showing right-sided hydronephrosis

Coronal CT image demonstrating dilatation of the right renal collecting system (arrow), consistent with right-sided hydronephrosis. The complete thoraco-abdominopelvic staging CT examination showed no additional nodal or extranodal lesions suggestive of secondary lymphomatous involvement. However, FDG-PET/CT was not performed because of limited local availability and financial constraints

FDG-PET: fluorodeoxyglucose-positron emission tomography; CT: computed tomography

Discussion

Primary lymphoma of the urinary bladder is a rare entity. The bladder normally contains little organized lymphoid tissue, which may partly explain the low frequency of lymphoma arising at this site. Chronic inflammatory stimulation has been proposed as a possible mechanism for the development of acquired mucosal lymphoid tissue, although the pathogenesis of primary bladder DLBCL remains incompletely understood [2,3].

Primary bladder lymphoma predominantly affects older adults and has frequently been reported in women. Hematuria is among the most common presenting manifestations, while dysuria, urinary frequency, urgency, and recurrent urinary tract infections have also been described [2-5].

Our patient had an atypical presentation. She had no reported hematuria, and the disease was discovered in the context of ureteral obstruction, hydronephrosis, and worsening renal function. This presentation initially suggested a pelvic or urological malignancy rather than lymphoma.

Radiological findings are nonspecific. Bladder lymphoma may present as focal or diffuse bladder wall thickening or as a bladder mass [2,4]. Because these appearances overlap with those of urothelial and other pelvic malignancies, imaging alone cannot reliably establish the diagnosis. Histological sampling is therefore indispensable.

DLBCL is characterized by a diffuse proliferation of large atypical lymphoid cells, often with centroblastic or immunoblastic morphology. Demonstration of B-cell differentiation through markers such as CD20 is essential [2].

In our patient, the tumor expressed CD20, CD10, BCL6, and BCL2, while MUM1 was negative. According to the Hans algorithm, this profile was consistent with a germinal-center B-cell phenotype [6]. The Ki-67 proliferation index was approximately 70%, reflecting the high proliferative activity typical of DLBCL.

C-MYC was expressed in approximately 40% of tumor cells. This finding should be interpreted with caution, as immunohistochemical expression alone does not establish a MYC rearrangement. Cytogenetic testing, particularly fluorescence in situ hybridization, is required when rearrangements involving MYC and BCL2 and/or BCL6 are suspected.

A major diagnostic issue in bladder lymphoma is distinguishing primary disease from secondary bladder involvement by systemic lymphoma. Secondary involvement is substantially more common. Complete staging is therefore mandatory before assigning a primary bladder origin [1-3]. In our case, although thoraco-abdominopelvic CT showed no additional nodal or extranodal involvement, FDG-PET/CT was not performed because of limited local availability and financial constraints. Therefore, the absence of additional lymphomatous involvement should be interpreted with caution, as PET/CT may detect occult disease not visible on CT.

Treatment differs substantially from that of urothelial carcinoma. While surgery is a cornerstone of management for many epithelial bladder tumors, DLBCL is primarily treated with systemic immunochemotherapy. Rituximab-based regimens, most commonly Rituximab with cyclophosphamide, doxorubicin, vincristine, and prednisone, remain central to first-line treatment in suitable patients. In patients older than 80 years who remain candidates for active treatment, attenuated regimens such as R-miniCHOP may be considered [7,8].

Management in nonagenarians is particularly challenging because therapeutic decisions must consider frailty, renal and cardiac function, comorbidities, performance status, and individual goals of care. In the present case, no lymphoma-directed therapy could be initiated because the patient died before treatment was started. Consequently, treatment response and lymphoma-specific outcome could not be assessed.

This case is noteworthy because of the rarity of primary bladder DLBCL, the patient's advanced age, and the unusual presentation through obstructive uropathy and renal dysfunction rather than hematuria. It also illustrates how a bladder lymphoma may initially mimic a more common urological or pelvic malignancy.

A limitation of this report is the absence of therapeutic response and longitudinal follow-up, as the patient died before lymphoma-directed treatment could be initiated. Furthermore, FDG-PET/CT was not performed because of limited local availability and financial constraints; therefore, occult nodal or extranodal disease cannot be completely excluded despite the absence of additional involvement on thoraco-abdominopelvic CT.

Conclusions

Primary DLBCL of the urinary bladder is a rare extranodal malignancy that may mimic urothelial or gynecological tumors. We report a 93-year-old woman presenting with ureteral obstruction, hydronephrosis, and acute deterioration of renal function rather than hematuria. Histological and immunohistochemical examination established the diagnosis of DLBCL with a germinal-center B-cell phenotype. Thoraco-abdominopelvic CT demonstrated no additional nodal or extranodal lymphomatous involvement, supporting, but not definitively establishing, a primary bladder origin. Because FDG-PET/CT was not performed, the possibility of occult nodal or extranodal disease cannot be completely excluded. No lymphoma-directed treatment was administered because the patient died before specific therapy could be initiated; therefore, treatment response and lymphoma-specific prognosis could not be assessed. This case illustrates the importance of considering lymphoma in the differential diagnosis of atypical bladder and pelvic masses and of obtaining histological confirmation before definitive management.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Mohammed Ramdani, Lamis El Yamani, Anouar El Moudane, Nada Zizi, Ali Barki

Acquisition, analysis, or interpretation of data: Mohammed Ramdani, Lamis El Yamani, Anouar El Moudane, Nada Zizi, Ali Barki

Drafting of the manuscript: Mohammed Ramdani, Lamis El Yamani, Anouar El Moudane, Nada Zizi, Ali Barki

Critical review of the manuscript for important intellectual content: Mohammed Ramdani, Lamis El Yamani, Anouar El Moudane, Nada Zizi, Ali Barki

Supervision: Mohammed Ramdani, Lamis El Yamani, Anouar El Moudane, Nada Zizi, Ali Barki

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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