Case Report

An unusual presentation of diffuse large B-cell lymphoma with ureteric involvement: A case report

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Abbreviations & Acronyms
CNS = central nervous system
CSF = cerebrospinal fluid
CT KUB = computed tomography of kidneys, ureters and bladder
DLBCL = diffuse large B-cell lymphoma
GUTB = genitourinary tuberculosis
LUTS = lower urinary tract symptoms
NHL = non-Hodgkin's lymphoma
PET = positron-emission tomography
PUTL = primary urinary tract lymphoma
RCHOP = rituximab, cyclophosphamide, liposomal doxorubicin, vincristine, and methylprednisolone

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Introduction: Non-Hodgkin's lymphomas are a heterogeneous group of malignancies in the lymphoid system and ureteric involvement by non-Hodgkin's lymphoma is very rare.

Case presentation: We present a 37-year-old male, presenting with lower urinary tract symptoms and right flank pain. Initially, he presented with lower urinary tract symptoms without having any evidence of urinary tract infection and was managed for nonspecific cystitis. His ureteral histopathology report indicated a diffused infiltration by malignant lymphoid cells and the final diagnosis revealed diffuse large B-cell lymphoma. His positron-emission tomography scan indicated stage 4 disease with skeletal involvement and he was then treated by rituximab, cyclophosphamide, liposomal doxorubicin, vincristine, and methylprednisolone chemotherapy. Later, he was also diagnosed with central nervous system lymphoma and died during his stay in the hospital.

Conclusion: Primary diffuse large B-cell lymphoma of the ureter is extremely rare; however, it should be considered in the differential diagnosis for patients presenting with obstructive uropathy as its early detection is crucial for diagnostic and therapeutic treatment.

Key words: case report, diffuse B-cell lymphoma, non-Hodgkin's lymphoma, obstructive uropathy, ureter.

Keynote message

Primary DLBCL of the ureter is extremely rare; however, it should be considered in the differential diagnosis of the patient presenting with obstructive uropathy. The survival of such patients improves with RCHOP chemotherapy but the development of CNS lymphoma, which is unusual and suggest having subclinical CNS diagnosis which may give a guide for treatment, suggest recommendations and define patient's prognosis.

Introduction

NHLs are a heterogeneous group of malignancies in the lymphoid system. B-cell lymphoma accounts for approximately 90% of all lymphomas.[1] Approximately, 30% of all NHLs usually present with a rapidly enlarging symptomatic mass and in majority of the cases it is due to nodal enlargement. However, extranodal disease with involvement of other tissue is quite common among B-cell lymphoma patients[2] and renal involvement is somewhat uncommon clinical presentation of NHL.[2] Lymphomas involving the urinary tract directly are unusual, although having compressive effect secondary to retroperitoneal lymphadenopathy is often evident.[3]

We present a 37-year-old man who presented with LUTS and obstructive uropathy secondary to distal ureteric stricture but his histopathology report revealed an unusual presentation of DLBCL in ureter.

The aim of this case report is to discuss the unusual presentation of large B-cell lymphoma in the ureter and the detection of subclinical CNS involvement and draw the attention of treating physicians to consider large B-cell lymphoma in differential diagnosis of soft tissue masses involving ureter.

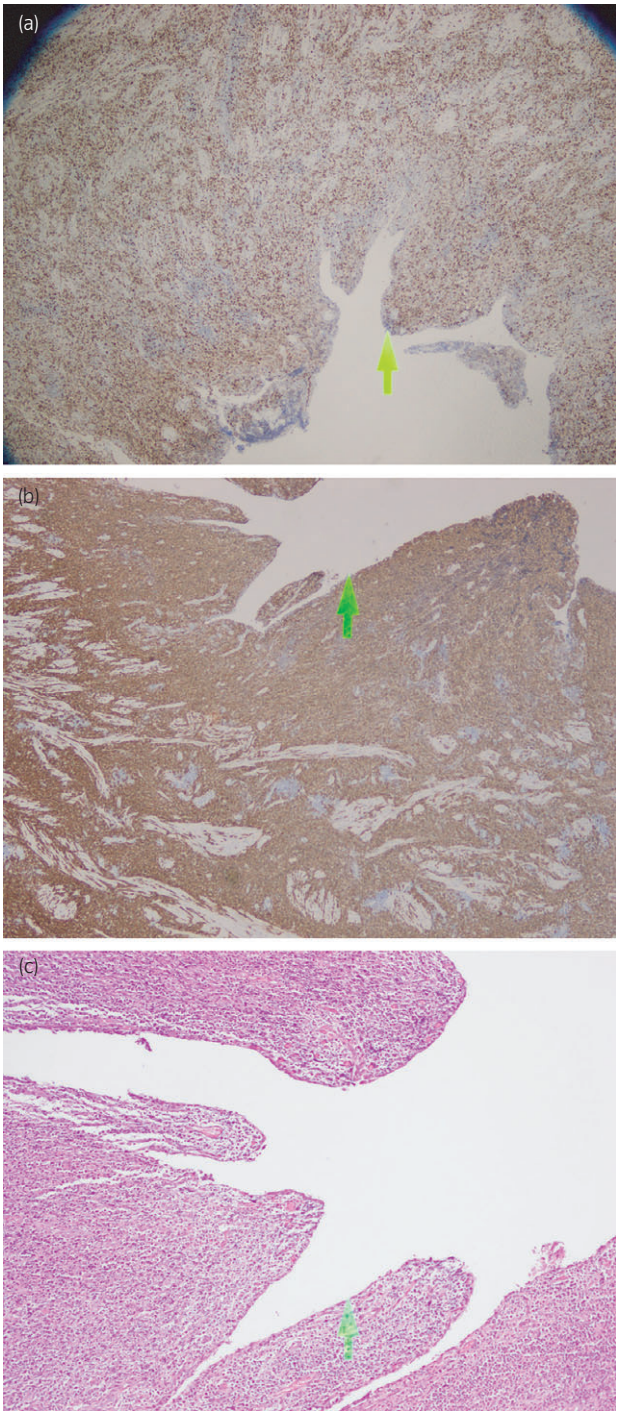

Fig. 1 (a) Proliferative index of tumor. 4 × 10. Arrow points to lumen of the ureter. (b) Immunohistochemical staining with CD 20. 4 × 10. Arrow points to lumen of the ureter. (c) H and E stained section. Arrow points toward lumen of ureter. 10 × 10 magnification.

Case presentation

A 37-year-old male presented to a tertiary care hospital with LUTS and right flank pain for the past 2 months with a history of hypertension and obstructive uropathy. Initially, he presented with LUTS without evidence of urinary tract infection and was managed for nonspecific cystitis. Later, he presented with severe LUTS; however, cystoscopy and biopsy was negative for GUTB. The histopathology showed portions of bladder mucosa covered by transitional cell epithelium of 3–4 layers thick surface, umbrella cells and subepithelial tissue infiltrated with moderately increased chronic inflammatory cells predominantly small mature lymphocytes mixed B and T types on immunochemistry (Fig. 1a–c).

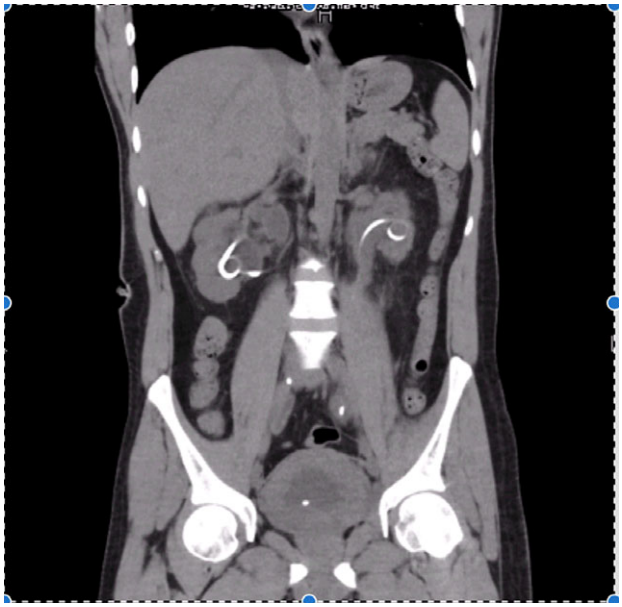

Fig. 2 Non-contrast enhanced CT (CT KUB) showing thick-walled urinary bladder and pre-sacral tissue infiltration.

Later, he presented with obstructive uropathy secondary to distal ureteric stricture. He empirically received treatment for GUTB and his obstructed kidneys were drained by percutaneous nephrostomy. His CT KUB showed bilateral gross hydroureteronephrosis with grossly thick-walled urinary bladder and presacral soft tissue infiltration (Fig. 2). He underwent insertion of double J stent at cystoscopy and bladder biopsy. He also underwent bilateral ureteric reimplantation and double J stent removal.

His ureteral histopathology report indicated diffuse infiltration by malignant lymphoid cells with necrosis in the ureter and fibro adipose tissue (Fig. 3a–c). He was diagnosed with DLBCL according to WHO classification of lymphoid neoplasm. His PET scan indicated stage 4 disease with skeletal involvement. He was treated by RCHOP six cycles of chemotherapy and subsequent PET scan indicated no evidence of recurrence. Later, the patient presented with headache and vomiting. Increased numbers of lymphocytes were seen in cytospin preparation. CSF was negative for malignancy but his magnetic resonance imaging revealed brain lesions. His CT head suggested CNS lymphoma and he was given IV steroids to reduce intracranial pressure. The patient was discharged in stable condition and was suggested PET CT to rule out any systematic disease for further management.

Later, the patient presented with febrile neutropenia and right arm cellulitis. IV antibiotics were administered to him but he passed away on the fifth day of admission.

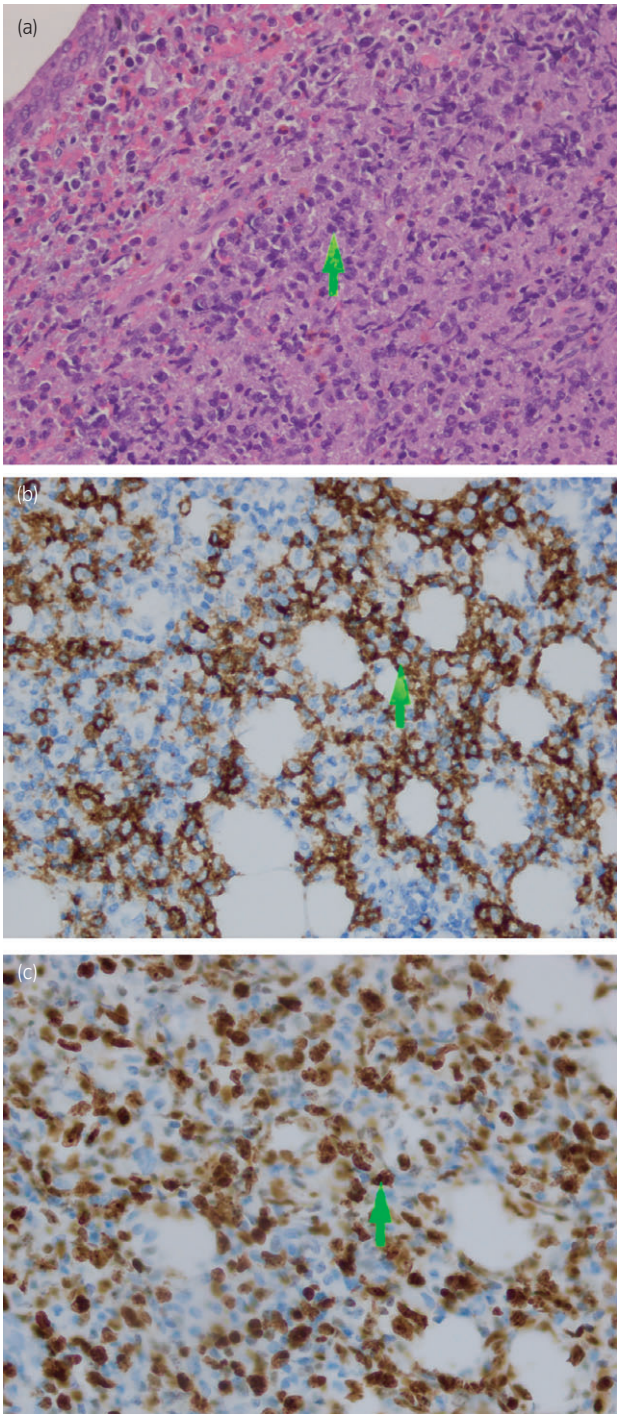

Fig. 3 (a) Malignant lymphoid infiltrate (arrow) beneath the urothelium on the left. H and E 20 × 10. (b) Pan B marker, CD 20, showing diffuse membranous positivity in the lymphoma cells involving periureteric tissue. 40 × 10. (c) Ki 67 immunohistochemical staining showing nuclear positivity (arrow) in proliferating cells reflecting high proliferative index.

Discussion

PUTL is a common disease.[4] The largest population-based study reported the incidence of PUTL of one case per one million people per year with predominant histology of DLBCL, 5-year overall survival and cancer-specific survival was 49% and 58%, respectively.[4] DLBCL is a common subtype of NHL which occurs at various sites. NHL has a greater tendency to spread to extranodal sites as compared to Hodgkin's lymphoma and gastrointestinal tract is the most common site.[3] However, involvement of genitourinary tract is very rare, constituting less than 5% of all extranodal lymphomas.[3] The clinical diagnosis of DLBCL in ureters is challenging due to lack of classical symptoms or specific imaging characteristics. In the literature, only 21 cases have been reported so far.

Our patients presented with complain of LUTS, right flank pain and history of obstructive uropathy with no abnormal physical signs that would indicate DLBCL. The disease is predominantly observed among males[5] and the patient usually presents with flank pain.[5] Our patient was diagnosed with DLBCL in the ureter on histopathology. Since ureteral lymphomas are rarely considered as the cause of ureteric obstruction, its diagnosis depends on histopathological examination.[5]

Our patient underwent CT KUB and PET scan indicating stage 4 disease with skeletal involvement; hence, the diagnosis was on the basis of imaging and biopsy. To assess the extent of DLBCL, it is imperative that patient should undergo combination of PET/CT scan. To differentiate between physiological and pathological uptake due to malignancy using PET alone could be challenging.[6] However, ureteroscopy with biopsy may provide more conclusive findings compared to radiography alone. Ni *et al.*[5] reported a case of DLBCL patient whose ureteroscopic biopsy revealed granuloma; however, subsequent nephroureterectomy revealed ureteral lymphoma. This highlights that when there is a strong suspicion of malignancy, resection is imperative for final diagnosis.

The treatment of ureter NHL varies and includes radiation after partial ureterectomy or chemotherapy.[7] Majority of the patients undergo chemotherapy after diagnosis of DLBCL which is established on histopathology and receive RCHOP chemotherapy and survive for more than 6 months.[8,9] Our patient received six cycles of RCHOP chemotherapy but he had short survival as later during the course of treatment he was diagnosed with CNS lymphoma on CT scan. The mechanism of lymphoma dissemination in CNS remains unclear but the role of adhesion molecules, chemokines, and matrix metalloproteinases in tumor invasion and metastasis is getting recognized.[10] The expression of certain genes[6] and adhesion molecules[10] on the surface of NHL cells is linked with the tendency toward extranodal involvement, tumor aggressiveness, and worst outcomes. The low sensitivity of CSF cytology suggests that a negative test is insufficient to rule out subclinical CNS involvement as was seen in our patient. The majority of the patients' survival improves with RCHOP chemotherapy. However, our patient's condition did not improve after chemotherapy as he had developed CNS lymphoma, which was unusual suggesting that it is important to test for CNS lymphoma by CT to increase its detection rate.[11] The detection of subclinical CNS involvement may guide the treatment, help give appropriate recommendations and define patient's appropriate prognosis.[12]

In conclusion, primary DLBCL of the ureter is extremely rare but it should be considered in the differential diagnosis

of the patient presenting with obstructive uropathy. Its identification is crucial for early diagnostic and therapeutic implications. The detection of subclinical CNS involvement may give a guide for treatment recommendations and define the patients' prognosis.

Consent of the patient

Consent was taken from the participant.

Conflict of interest

The authors declare no conflict of interest.

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