Acute Renal Injury Secondary to T Cell Lymphoma Infiltration: Case Report

T Hücreli Lenfoma İnfiltrasyonuna Bağlı Akut Böbrek Hasarı

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ABSTRACT Diffuse bilateral infiltration of the kidneys by lymphoma is one of the rarest causes of renal insufficiency. Acute renal failure as the initial manifestation of the lymphoma is reported in very few cases. Our cases were interesting because they presented with acute renal failure which is a rare presentation type of lymphomas and kidney biopsy was the only diagnostic approach for their exact diagnosis. Here, we report two cases presenting with acute renal failure secondary to infiltration of the kidneys due to T-cell non Hodgkin lymphoma.

Key Words: Acute kidney injury; lymphoma, T-cell; biopsy, needle

ÖZET Lenfomaya bağlı bilateral diffüz infiltrasyonu nedeniyle gelişen böbrek yetmezliği çok nadir bir durumdur. Lenfomanın ilk belirtisi olarak akut böbrek yetmezliği ile başvuran çok az olgu vardır. Bizim olgularımız lenfomanın nadir bir belirtisi olan akut renal yetmezlikle başvurmaları nedeni ile ilginçtir ve kesin tanı için böbrek biyopsisi yeterli olmuştur. Biz T-hücreli non- Hodgkin lenfomanın böbrek infiltrasyonuna bağlı olarak gelişen akut böbrek yetmezliğinin ilk belirti olduğu iki olguyu bildiriyoruz.

Anahtar Kelimeler: Akut böbrek hasarı; lenfoma, T-hücreli; biyopsi, iğne

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Non-Hodgkin lymphoma (NHL) may cause acute renal failure at a rate of 30-40% on its natural history but acute renal failure is an unusual manifestation of lymphoma infiltration of the kidney and is infrequently the presenting sign of a hematological malignancy.[1] Recognition of this cause of acute renal failure is important because it often responds to chemotherapy. The pathophysiological characteristics of acute renal insufficiency in patients with renal involvement by non-Hodgkin lymphoma are believed to be tubular compression and impairment of renal parenchymal blood flow.[2] Renal failure in patients with lymphoma could also be the result of other factors such as sepsis, volume depletion, uric acid nephropathy in association with tumor cell lysis syndrome, obstructive uropathy, nephrotoxic drugs, renal vein thrombosis, and glomerulonephritis. Here, we report two cases of NHL who presented with acute renal failure.

CASE REPORTS

CASE 1

A 28-year-old male patient was admitted to our clinic with headache, vomiting and nausea for two weeks with no history of acute and chronic disease and medication. Physical examination revealed a blood pressure of 180/110 mmHg. He had minimal peripheral edema but neither organomegaly nor lymphadenopathy was present. Daily urine output was approximately 1500 cc. Laboratory findings were as follow: Hemoglobin 18.9 g/dl, hematocrit 57.8%, white blood count 7.16x10^3/ul, platelets 371x10^3/ul, BUN: 59.7 mg/dl (5-20), creatinine (Cr) 7.07 mg/dl (0.6-1.3), serum phosphorus 6.86 mg/dl (2.4-4.5), LDH 1515 U/L (240-480). Other hematological and biochemical parameters were within normal limits. The microscopic examination of urine was normal. Ultrasonographic evaluation revealed that the right kidney was 143 x 72 mm and the left kidney was 132 x 77 mm. Renal Doppler imaging was normal. A kidney biopsy was performed because of acute renal failure. Microscopic examination showed diffuse infiltration of the tubulointerstitial compartment by atypical lymphoid cells with round to oval to irregularly shaped nuclei with dispersed chromatin. Only two glomerul were identified in the biopsy specimen and both showed no pathological changes (Figure 1). Immunohistochemically, the tumor cells were diffusely positive for CD3, CD8 and terminal deoxynucleotidyl transferase (TdT) but negative for CD20 (Figure 2). Bone marrow aspiration and biopsy were both normal. CT scan of the neck showed a deep cervical lymphadenopathy. Microscopically, the lymph node was diffusely infiltrated by lymphoblasts. With these results our patient was diagnosed as having T cell lymphoblastic lymphoma with kidney infiltration. According to the Ann Arbor Classification the patient is in stage I-E. We performed both hemodialysis and chemotherapy with hyper CVAD/MTX-Cytarabine (cyclophosphamide, vincristine, doxorubicin, dexamethasone/methotrexate-Cytarabine). After four days BUN was 16 mg/dl, Cr was 1.5 mg/dl and there was no need for further hemodialysis. USG on the 10th day of the treatment revealed that the right kidney was 110 mm and the left kidney was 116 mm.

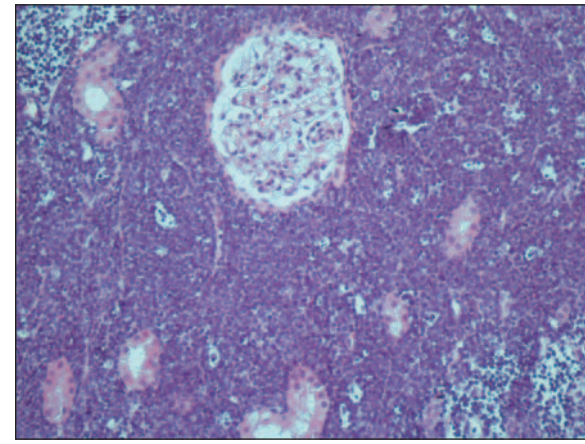

FIGURE 1: Case 1. Diffuse infiltration of renal interstitium by lymphoblasts (HE, x200).

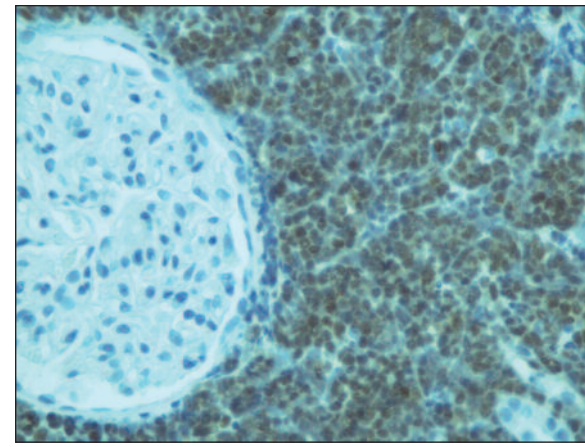

FIGURE 2: Case 1. Diffuse positivity of tumor cells for TdT (x400).

CASE 2

A 33-year old male patient was admitted to our clinic with fever, oliguria and weight loss. Physical examination revealed a blood pressure of 110/70 mmHg and a body temperature of 38.5 ˚C. He had no lymphadenopathy but he had hepatosplenomegaly. He had proteinuria (3.6 g/day). Laboratory findings were as follows: Hemoglobin 8,7 g/dl, hematocrit 23.9%, white blood count 3.8x10^3/ul, platelets 109x10^3/ul, BUN: 83.7 mg/dl (5-20), Cr 9.97 mg/dl (0.6-1.3), LDH 1142 U/L (240-

480). Other hematological and biochemical parameters were within normal limits. The microscopic examination of urine was normal. Complement levels were also normal. Ultrasonographic evaluation revealed that the right kidney was 130 x 79 mm and the left kidney was 141 x 82 mm. He had pleural effusion on his chest x-ray. Kidney biopsy revealed a diffuse infiltration of medium sized or large lymphoid cells with irregular hyperchromatic nuclei in the tubulointerstitial compartment. Five glomeruli were seen in the biopsy specimen. One of them was globally sclerotic. Two glomeruli showed mild increase in mesangial matrix and mesangial hypercellularity. The remaining two glomerulia demonstrated no abnormalities (Figure 3). Some cells had prominent nucleoli. Neoplastic cells were strongly positive for CD3 (Figure 4). CD 43 was positive in a minority of cells. CD30, CD20, TdT, CD10 and CD5 were negative. The tumor was diagnosed as a peripheral T cell lymphoma, unspecified. CT scan of the abdomen showed both hepatosplenomegaly and enlargement of paraaortic lymph nodes. There was also multiple bone involvement in FDG-PET CT but bone marrow aspiration and biopsy were both normal. According to the Ann Arbor Classification, the patient is in stage IV-E. We performed both hemodialysis and chemotherapy with hyper CVAD/ MTX-Cytarabine as in the first case. After the first chemotherapy there was no need for hemodialysis and the creatinine became 2.5 mg/dl.

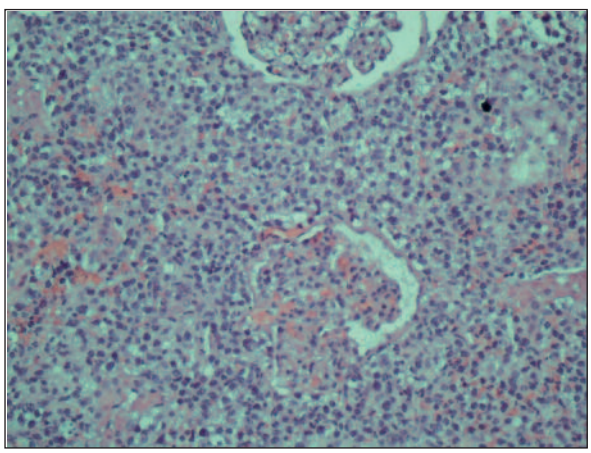

FIGURE 3: Case 2. Diffuse infiltration of renal interstitium by medium-sized or large lymphoid cells with irregular hyperchromatic nuclei (HE, x 200).

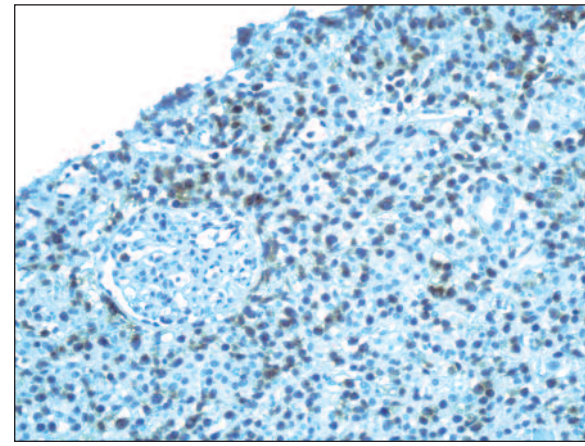

FIGURE 4: Case 2. Tumor cells are diffusely positive for CD3 (x200).

DISCUSSION

Bilateral diffuse infiltration of the kidneys by lymphoma is one of the rarest causes of renal failure. Renal involvement has been seen in 30-40% of systemic lymphomas and autopsy reports suggest an incidence of 50% but acute renal failure as the initial finding of a systemic lymphoma is an infrequent condition and has been seen in only a few patients.[1-4] Compression of tubules by dense tumor infiltration and impaired renal vascularization may cause renal failure. Renal replacement therapy may be required in cases of hyperkalemia, hyperphosphatemia or severe renal insufficiency that are secondary to the rapid destruction of tumor cells in the treatment of lymphoma.[5]

T-cell NHL is relatively rare and constitutes12% of all lymphomas but when compared to B-cell lymphomas, T-cell lymphomas are more aggressive and have a worse prognosis.[6,7] T cell lymphoblastic lymphomas constitute 5% of all lymphomas and generally have an aggressive course.[8] More than 80% of patients present with stage 3 or 4 disease at the time of admission.[9] Thirty percent of patients have cervical, supraclavicular or axillary lymph nodes and 50-75% of patients have a mediastinal mass.[10] Extranodal involvement is rare. Abdominal involvement is unusual and primarily includes spleen and liver.[9] Treatment of adult T or B lymphomas requires aggressive chemotherapy protocols such as Hyper-CVAD but these lymphomas have a worse

prognosis than the other subtypes of NHL because of the high relapse rates and the prognosis after a relapse is very poor.[11]

Our first case presented with acute renal failure which is a rare presentation type of lymphomas. Becker et al. described a case of T cell lymphoblastic lymphoma which presented with hypertension, polycythemia and renal failure.[5] Our case was the second case in the literature which presented with hypertension, polycythemia and acute renal failure.

Our second patient had proteinuria in nephrotic range. Like our other patient, the glomeruli were not infiltrated by tumor cells. But, unlike the other, in the biopsy specimen of the second patient, one glomeruluswas globally sclerotic and two others showed a mild increase in mesangial matrix and mesangial hypercellularity. These histopathological changes with nephrotic-range proteinuria may reflect the presence of an accompanying glomerulonephritis in this patient. However, due to the lack of immunfluorescence preparation, at definitive diagnosis can not be rendered.

In our patients tumour lysis syndrome did not develop. In the first week of chemotherapy when cell lysis is maximal hemodialysis was performed everyday to prevent tumour lysis syndrome development.

Peripheral T cell lymphomas constitute 6% of all lymphomas.[12,13] At the time of admission, 65-70% of patients present with stage 4 disease.[14] It has an aggressive course and relapse rates are higher than diffuse B cell lymphomas. In a study, including 84 peripheral T cell lymphoma patients, the rate of extranodal involvement was 60% but there was no renal involvement. Pleural effusion, high levels of LDH, B type symptoms, older age (>60 years) and stage 3 or 4 disease are the criteria of a bad prognosis.[15] The complete remission rate of peripheral T-cell lymphomas with treatment is 60% and the mean survival is 45 months.[16] Our second case presented with stage 4B disease and had all the bad prognostic criteria except age.

In conclusion, T-cell lymphomas are aggressive lymphomas and for this reason the diagnosis and the treatment must be performed as quickly as possible. Our cases were interesting because they presented with acute renal failure, which is a rare presentation type of lymphomas, and kidney biopsy was the only diagnostic approach for their exact diagnosis. There was no need for any further invasive or non invasive diagnostic approach in our cases.

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