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Case Report

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Kidney-localized and temporarily self-limiting CD5-positive intravascular large B-cell lymphoma

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Abstract

A 56-year-old Japanese man patient visited Shimada Municipal Hospital, Shimada, Japan, with complaints of melena, cold sweat, dizziness and anorexia, lasting for three days. Computed tomography (CT) values around the bilateral kidneys and retroperitoneum were increased. Lactate dehydrogenase (LDH) and soluble interleukin-2 receptor (sIL-2R) were elevated in the serum, and the estimated glomerular filtration rate (eGFR) was decreased. Needle biopsy of the kidney indicated CD5-positive intravascular large B-cell lymphoma (IVLBCL) solely involving the capillary lumen. One week after the renal biopsy procedure, LDH, sIL-2R and eGFR levels became improved, and his complaints got relieved even without chemotherapy. Four months later, the patient became febrile and the laboratory markers showed abnormal values again, strongly suggesting the recurrence of IVLBCL. Temporal spontaneous remission of IVLBCL is a rare phenomenon. It is supposed that the renal biopsy might have provoked spontaneous remission via the modulation of the host immune system. (147 words)

Keywords: B-cell lymphoma, CD5, intravascular large B-cell lymphoma, Kidney

Abbreviated

CT: Computed Tomography
eGFR: Estimated Glomerular Filtration Rate
FDG PET-CT: Fluorodeoxyglucose Positron Emission Tomography - Computed Tomography
IVLBCL: Intravascular Large B-cell Lymphoma
LDH: Lactate Dehydrogenase
R-CHOP: Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, And Prednisolone
sIL-2R: Soluble Interleukin-2 Receptor

Introduction

Intravascular large B-cell lymphoma (IVLBCL) is a rare subtype of non-Hodgkin lymphoma characterized by proliferation of the large-sized B-lymphoma cells selectively within the capillary lumen [1]. The age ranges from 34 to 90 years with the median at 70 [2]. Symptoms of the patient with IVLBCL are related to the site of small vessel occlusion, and fever is frequently associated. There are two variants in clinical presentation [3]. The classical type, mainly seen in Western Europe, is characterized by the involvement of the brain and skin. Hemophagocytic syndrome-related type has predominantly been reported in Asia and is featured by multiorgan failure with hepatosplenomegaly and cytopenia. The lymphoma cells of the Asian type often express CD5 [4]. IVLBCL is clinically aggressive, resulting in a fatal outcome [1]. The antemortem diagnosis is often difficult because of the lack of the diagnostic algorithm. However, cases accompanying a long-term survival have been reported [1]. Some cases showed a spontaneous remission without therapies [5-9].

We described herein a 56-year-old Japanese man with CD5-positive IVLBCL radiologically involving the kidney and retroperitoneal tissue. It is of note that after needle biopsy, temporal spontaneous remission lasting for four months was observed without chemotherapy.

Case Presentation

A 56-year-old Japanese male patient had a past history of ataxia and depression. He had taken Loxoprofen and Rebamipide. The patient visited Shimada Municipal Hospital, Shimada, Shizuoka, Japan, with

complaints of melena, cold sweat, dizziness and anorexia, lasting for three days. He was afebrile. Esophagogastroduodenoscopy and abdominal computed tomography suggested a Loxoprofen-induced ulcer in the duodenum. Computed tomography (CT) values around bilateral kidneys and retroperitoneum were increased (Figure 1). Neither hepatosplenomegaly nor lymphadenopathy was found. The red cell count was 2,640,000/μL, leukocyte count 11,100/μL, and thrombocyte count 211,000/μL. The estimated glomerular filtration rate (eGFR) was decreased to 57 mL/minute, while urine protein was negative. Lactate dehydrogenase (LDH) was elevated to 586 U/L in the serum, and soluble interleukin-2 receptor (sIL-2R) to 952 U/mL.

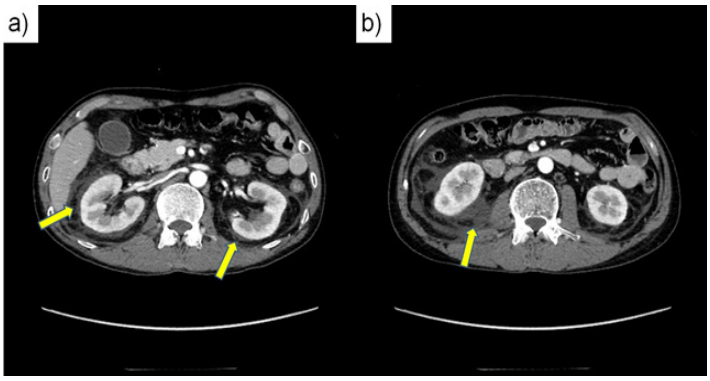

Figure 1: Enhanced computed tomography (CT) of the kidneys and retroperitoneum. CT values are increased around the bilateral kidneys and the retroperitoneum (yellow arrows).

Under a suspicion of malignant lymphoma, needle biopsy of the kidney was performed. Intravascular proliferation of large-sized atypical B-lymphocytes was focally identified in the glomerulus and in peritubular capillary vessels (Figure 2). The atypical lymphoid cells expressed CD45, CD20, CD79a, CD5, PAX5, bcl-2, bcl-6 and MUM1, and the Ki-67 labeling index was as high as 100% (Figure 3). Negative markers included CD10, CD3, cyclin D1 and CD23. Epstein-Barr virus-related nuclear RNA (EBER) was not detected. The histopathological diagnosis of CD5-positive IVLBCL was thus made.

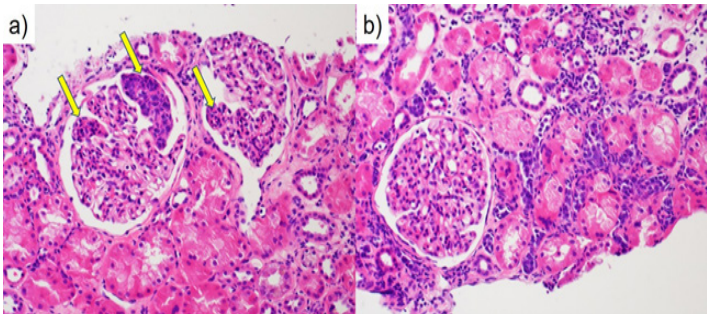

Figure 2: Microscopic appearance of needle biopsy from the kidney. (a&b: H&E) Large-sized atypical lymphoid cells proliferate segmentally in glomerular capillary lumina (a, yellow arrows) and also within peritubular capillary vessels (b).

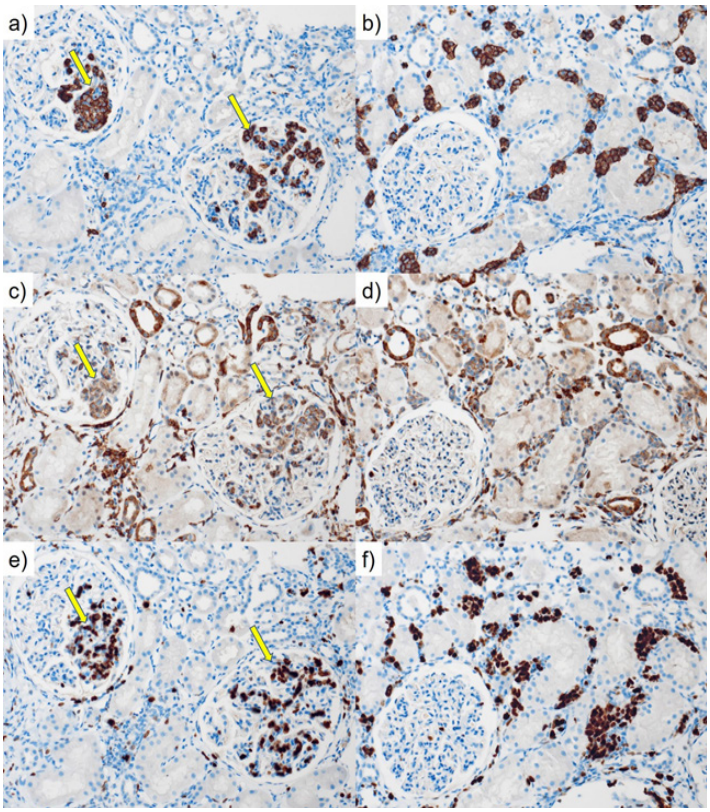

Figure 3: Immunohistochemical findings of IVLBCL in the glomerulus (a, c & e) and in the peritubular capillary vessels (b, d & f). The intravascular lymphoma cells are immunoreactive for CD20 (a&b) and CD5 (c&d). Ki-67 labeling index is almost 100% (e&f). Yellow arrows indicate the lymphoma cells in the glomerulus.

A subcutaneous mass on his left-sided chest was histologically proven as benign lipoma, and a 1 cm-sized cystic lesion on the back was proven as epidermal cyst. Normal-looking skin samples were taken from the chest and back, as well as randomly from the left forearm. No lymphomatous infiltration was observed microscopically. [18F]-fluorodeoxyglucose-positron emission tomography-computed tomography (FDG PET-CT) showed no intense FDG uptake in both kidneys and the skin (Figure 4). One week after the renal biopsy procedure, the levels of LDH, sIL-2R and eGFR became improved, and his lymphoma-related complaints disappeared. The improvement of eGFR was tentative. The profiles of eGFR, LDH and sIL-2R are demonstrated in (Figure 5).

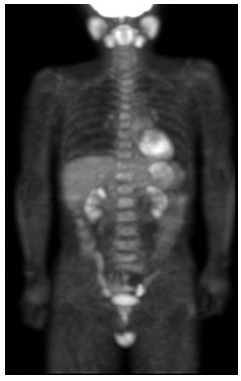

Figure 4: FDG PET-CT: Physiological accumulation of FDG is observed. No intense FDG uptake is seen in both kidneys and the skin.

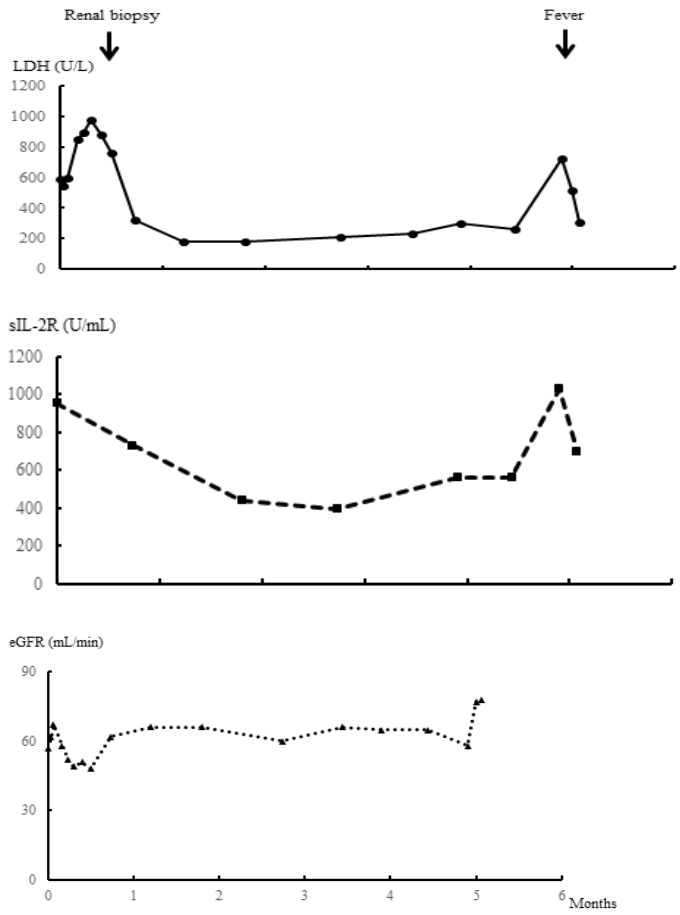

Figure 5: Profiles of the values of LDH, sIL-2R and eGFR. The respective markers showed temporary improvements after the renal biopsy procedure, but deteriorated again at the time of patient's re-hospitalization with fever.

The patient was followed up in the outpatient clinic without giving chemotherapy. The clinic pathological features indicated kidney-limited IVLBCL accompanying spontaneous remission. Four months after the renal biopsy procedure, he re-visited the hospital with complaints of fever (38.0 °C). The values of LDH, sIL-2R and eGFR got elevated again, strongly suggesting the recurrence of IVLBCL. Red cell and thrombocyte counts were stable, and the association of hemophagocytic syndrome was not evident. The patient underwent R-CHOP therapy (rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisolone). Bone marrow biopsy did not show evidence of lymphomatous involvement or hemophagocytosis. Random skin biopsy sampled from the leg skin was negative for the lymphomatous involvement.

Discussion

We experienced a case of kidney-localized IVLBCL, accompanying temporal spontaneous regression after the kidney biopsy procedure. Japanese cases of IVLBCL predominantly belong to hemophagocytic syndrome-related type expressing CD5 [7]. In the present case, the large-sized B-lymphoma cells expressed CD5, the lesion was limited to the kidneys and retroperitoneum. Features suggesting the association of hemophagocytic syndrome, such as multiorgan failure, hepatosplenomegaly and cytopenia, were not seen. The lesion should be categorized in a relatively indolent form of CD5-positive IVLBCL.

The renal lesion of IVLBCL is rare: a total of 39 cases of IVLBCL with renal involvement have been reported [10]. Proteinuria and renal failure were observed in 92% and 66%, respectively. In the present case, mild renal dysfunction was noted temporarily, and proteinuria was negative. It has been reported that FDG PET-CT is useful in demonstrating IVLBCL: in four cases of IVLBCL, FDG accumulation was demonstrated in the renal cortex [11]. The present case, however, did not show FDG accumulation in the kidney. Random skin biopsy is known to be effective in making a diagnosis of IVLBCL: Matsue, et al. reported that 10 (88%) of 12 IVLBVL patients showed positive results in random biopsy from the normal-looking skin [12]. In the present case, skin biopsy from the chest, back and forearm failed to show skin involvement. These findings were consistent with kidney-localized involvement of IVLBCL.

Spontaneous remission of malignant neoplasms is defined as complete or partial disappearance of the malignant tumor without any treatment or with therapy that is considered inadequate to exert a significant influence on the neoplastic disease [13]. Spontaneous remission has been recorded in 10% to 23% of patients with low-grade malignant lymphoma [14-16]. Spontaneous remission has also infrequently been reported in cases of IVLBCL. In cases of IVLBCL accompanying spontaneous remission, the lung, bone marrow, cavernous sinus and kidney were involved [5-9]. The mechanisms of spontaneous remission of malignant tumors is supposedly related to apoptosis of the lymphoma cells, defensive activity by the immune system and change in the tumor microenvironment [17]. The traumatic intervention such as needle biopsy may modulate the host immune system and can trigger spontaneous remission [18]. In the present case, in fact, the improvement of the serum markers began one week after the renal biopsy procedure.

Malignant lymphoma frequently recurs after the spontaneous remission [5, 7-9]. The period between the remission and the recurrence ranges from one to 27 months. In most cases showing the lymphoma recurrence, chemotherapy such as R-CHOP was given, and some cases achieved complete remission [5, 7]. Reportedly, rituximab-containing chemotherapy is effective against IVLBCL, and thus it is expected that R-CHOP chemotherapy may improve the prognosis of the present case [19].

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