Renal Involvement in Chronic Lymphocytic Leukemia: A Case Report

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Abstract

Chronic lymphocytic leukemia (CLL) is a neoplastic condition of B cells that frequently affects the lymph nodes, liver, spleen and bone marrow. The extranodal involvement of CLL is most commonly observed in the skin, whereas gastrointestinal and genitourinary involvement is rare. Renal involvement may not always present with renal failure. In this study, we aimed to present a patient with CLL infiltration in the kidney without renal failure and proteinuria. 

Keywords: Chronic lymphocytic leukemia, extranodal, kidney, involvement

Introduction

Chronic lymphocytic leukemia (CLL)/small lymphocytic lymphoma (SLL) is a mature B-cell neoplasm characterized by the progressive accumulation of monoclonal B lymphocytes. Malignant cells in CLL and SLL have the same pathological and immunophenotypic properties. CLL/SLL accounts for approximately 25%-30% of all leukemias (1) and is more common in men than in women (male: female ratio is between 1.3:1 and 1.7:1) (1,2). It is considered to occur commonly in older adults, and the median age of incidence is 70 years (3). In most cases, diagnosis is made by the investigation of lymphocytosis identified during routine examination. Symptomatic cases may present with complaints related to lymphadenomegaly or organomegaly (splenomegaly or hepatomegaly) and/or general symptoms, such as fatigue, weight loss, anorexia and fever (4). CLL/SLL cells can infiltrate into any organ, but because of its ease of examination, the most frequently involved non-lymphoid tissue at the time of diagnosis is the skin. Skin lesions (leukemia cutis) on the face and the other lymphomas, clinically significant gastrointestinal mucosal involvement is rare in CLL/SLL. Similarly, meningeal leukemia is not expected at the time of diagnosis (6).

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A 63-year-old male patient was being followed up with a diagnosis of Stage 2 CLL since 2016. The patient complained of night sweats and 1.7:1 ratio. It is considered to occur commonly in older adults, and the median age of incidence is 70 years (3). In most cases, diagnosis is made by the investigation of lymphocytosis identified during routine examination. Symptomatic cases may present with complaints related to lymphadenomegaly or organomegaly (splenomegaly or hepatomegaly) and/or general symptoms, such as fatigue, weight loss, anorexia and fever (4). CLL/SLL cells can infiltrate into any organ, but because of its ease of examination, the most frequently involved non-lymphoid tissue at the time of diagnosis is the skin. Skin lesions (leukemia cutis) on the face and the other lymphomas, clinically significant gastrointestinal mucosal involvement is rare in CLL/SLL. Similarly, meningeal leukemia is not expected at the time of diagnosis (6).

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left kidney upper pole. Abdominal computed tomography (CT) revealed a hypodense lesion of approximately 22×18 mm, with a mean density of 69 Hounsfield units in the left kidney upper pole posterior (Figure 1). Needle biopsy was performed on this lesion, and the following results were reported: CD20 (+), CD5 (+), CD23 (+), Bcl2 (+), CD3 (−), CD10 (−), Bcl6 (−), cyclin D1 (−), Tdt (−) and Ki67 proliferation index was 5%. A diagnosis of CLL/SLL was made (Figure 2). The overall condition of the patient was good, with an Eastern Cooperative Oncology Group performance score of 1. Thus, rituximab-bendamustine chemotherapy was started. Informed consent was obtained from the patient.

Discussion

Renal insufficiency is common in patients with CLL, with a prevalence of 7.5% at the time of diagnosis and 16.2% over the course of the disease (7). The mechanism of renal insufficiency in these patients is variable. CLL infiltration can cause compression on renal tubules and microvasculature, resulting in renal obstruction and ischemia. Other potential causes of renal insufficiency in patients with CLL include contrast-induced nephropathy, treatment-induced tumor lysis, chemotherapy-induced toxicity and ureteral obstruction with lymphadenopathy (8). CLL can also result in various glomerular pathologies, including acute glomerulonephritis, nephrotic syndrome and chronic glomerulonephritis (8).

In a previous study, among the 4024 patients diagnosed with CLL and monoclonal B-cell lymphocytosis at Mayo Clinic, renal biopsy was performed in 49 patients (1.2%) due to renal insufficiency and nephrotic syndrome. Biopsy results revealed membranoproliferative glomerulonephritis (20%), CLL interstitial infiltration as primary etiology (12%), thrombotic microangiopathy (12%) and minimal change disease (10%) (9). In another study, renal biopsy was performed in 15 patients diagnosed with CLL, and CLL infiltration was detected in 10 of these patients (10). In a study on 700 patients with non-Hodgkin's lymphoma and CLL, renal infiltration was detected only in five patients (11). The retrospective evaluation of 52 patients with malignant B-cell infiltration in the kidney revealed that patients were diagnosed with Waldenström's macroglobulinemia (n=21), CLL (n=11), diffuse large B-cell lymphoma (n=8), other lymphomas (n=11) and multiple myeloma (n=1) (12). Contrary to these data, autopsy studies have indicated that 60%-90% of the patients have leukemic cell infiltration in the kidneys, but renal function remains intact even in late stages (13).

Renal insufficiency at diagnosis was found to be associated with male sex, advanced age, more advanced disease and CD49d positivity. Acute kidney injury developed in 16% of the patients during follow-up. The development of renal insufficiency during follow-up was shown to be associated with advanced age, male sex and certain CLL characteristics (Immunoglobulin heavy chain variable region genes unmutated, CD49d+, CD38+, ZAP-70+, del17p− and del11q−) (7). It has been reported that renal function improves with CLL treatment in several patients with infiltrative disease on biopsy (10).

In a study, the presence of renal disease was found to be independently associated with adverse patient outcomes in CLL. It was shown that overall survival is significantly lower in patients with renal disease at the time of CLL diagnosis or during follow-ups than in patients without renal disease (9).

The most common imaging finding of renal involvement in leukemia is nephromegaly, which can affect one or both kidneys and is caused by widespread or nodular parenchymal infiltration of leukemic cells (14). However, the sensitivity and specificity of this finding remain unknown. For example, nephromegaly was detected only in 1 of the 10 patients with proven renal infiltration on biopsy (10). Obstructive uropathy can also be observed in CLL. Diagnosis can be made using imaging methods, such as USG, CT and magnetic resonance imaging (15).

In conclusion, renal involvement is rarely observed in CLL. Each case of renal insufficiency observed in CLL may not be related to infiltration. Post-renal renal insufficiency due to paraneoplastic syndromes, tumor lysis syndrome, chemotherapy-related toxicity and lymphadenopathies should not be overlooked.

Ethics

Informed Consent: Informed consent was obtained from the patient.
Referanslar