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Renal Involvement of Chronic Myelogenous Leukemia Presenting as a Kidney Tumor

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Renal involvement by leukemic cells is rare in chronic myelogenous leukemia (CML). Herein, this study reports a case of CML associated with renal involvement of leukemic cells, which occurred 1 and 1/2 years after the initial diagnosis. Abdomino-pelvic computed tomography revealed a 4.4 × 4.2 cm-sized, low-density solid mass having a thick wall from the mid to lower pole of the left kidney. A peripheral blood analysis revealed blastic transformation of CML. The biopsied renal parenchyme was diffusely infiltrated by sheets of immature myeloid cells, polymorphonuclear leukocytes, and occasional eosinophils. Most of the infiltrating cells were positive for anti-neutrophil elastase, but negative for lymphoid markers. Therefore, differential diagnosis of a kidney tumor during the course of CML, especially in the time of blastic transformation, should be performed.

Key Words: Chronic myelogenous leukemia, kidney tumor, leukemic infiltration

INTRODUCTION

Chronic myelogenous leukemia (CML) is a myeloproliferative disease that originates in an abnormal pluripotent bone marrow stem cell and it is consistently associated with the Philadelphia chromosome and/or BCR/ABL fusion gene.[1] The extramedullary features associated with CML mainly involve the lymph nodes, skin, soft tissue, and central nervous system, all of which show leukemic infiltration.[1] Renal involvement by leukemic cells occurs infrequently in CML, and only a few cases have been reported in world literature[2,3] This report presents a case of CML associated with renal involvement of leukemic cells, which subsequently formed a kidney mass.

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CASE REPORT

Clinical summary

A 72-year-old female patient presented with abdominal pain, which she had experienced for 2 weeks. She also complained of fever and a chilling sensation. She had a history of having undergone a right nephrectomy due to renal cell carcinoma 6 years earlier. A diagnosis of CML, in which major BCR/ABL genes were rearranged, had been made 1 and 1/2 years prior to admittance. From this point, the patient had been taking hydroxyurea.

At the time of admission, a peripheral blood analysis revealed blastic transformation of CML. Abdomino-pelvic computed tomography revealed a 4.4 × 4.2 cm-sized, low-density solid mass having a thick wall from the mid to lower pole of the left kidney (Fig. 1). Multiple lymph node enlargements were noted in the paraaortic and hilar regions. Splenomegaly was also found. Under the assumption that the patient had a possible renal abscess or metastatic tumor, an untrasono-guided biopsy was performed on the left renal mass.

Pathologic findings

The patient's renal parenchyme was diffusely infiltrated by sheets of dyshesive cells that had ovoid to irregularly shaped vesicular nuclei with

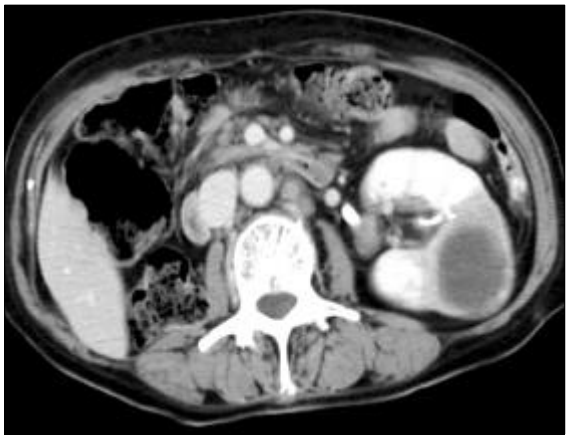

Fig. 1. Abdomino-pelvic CT revealed a 4.4 × 4.2 cm-sized, low-density solid mass having a thick wall from the mid to lower pole of the left kidney.

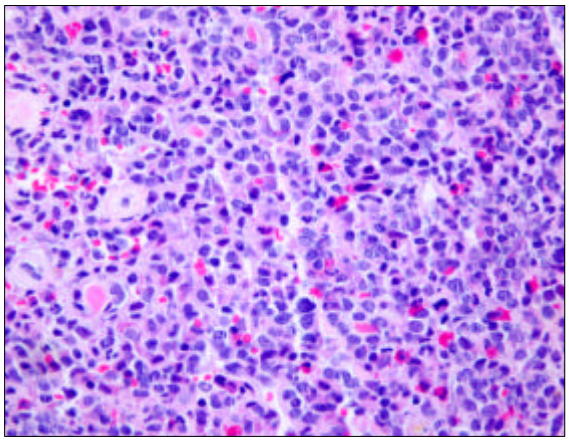

Fig. 2. Biopsied renal parenchyme showed diffuse infiltration of the sheets of immature myeloid cells admixed with neutrophils and eosinophils.

no distinct nucleoli, and a modest amount of pale eosinophilic granular cytoplasm. These cells were thought to be immature myeloid cells (myelocytes). Blastic cells were rarely found. Polymorphonuclear leukocytes and eosinophils were also admixed. A few eosinophilic myelocytes with eosinophilic granules were noted (Fig. 2). These histologic findings were consistent with well-differentiated (mature) myeloid sarcoma.[4,5] Most of the infiltrating cells were positive for anti-neutrophil elastase (1 : 100, NP57, DAKO), which stained neutrophils and their precursors (Fig. 3), but negative for CD20, CD79a and CD3. Less than 10% of the cells were positive for CD99, and a few cells showed weak nuclear positivity for TdT. A

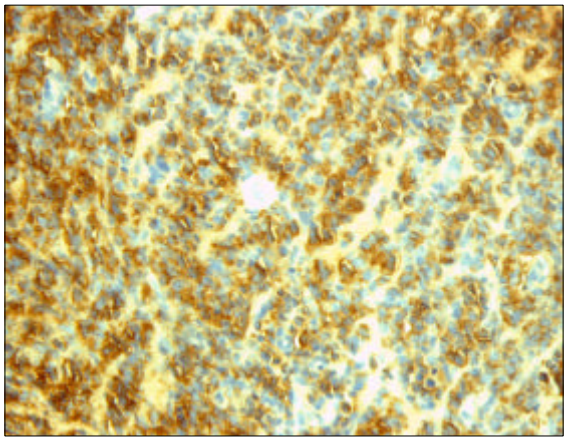

Fig. 3. Most of the infiltrating cells were positive for anti-neutrophil elastase.

diagnosis of renal involvement of CML was made. No specific treatment was given.

DISCUSSION

In the CML-chronic phase, leukemic cells are minimally invasive and their proliferation is largely confined to hematopoietic tissues: primarily the blood, bone marrow, spleen, and liver. During the blastic phase, not only these sites, but also a number of extramedullary tissues including the lymph nodes, skin, soft tissue and central nervous system, may show leukemic infiltration.[1]

Renal manifestation or renal involvement is rare in CML.[2,3] Renal dysfunction is usually found in blastic crisis of CML. Renal infiltration of leukemic cells has been recognized in patients who had renal dysfunction, as well as acute tubular insufficiency or necrosis, and hypercalcemic nephropathy in autopsy cases.[3] Furthermore, a case of CML complicated with minimal change nephrotic syndrome and a case with proliferative glomerulonephritis have also been reported.[6,7]

Renal involvement is also rare in chronic myelomonocytic leukemia (CMML), which might be grouped with CML, although it also can be considered as a myelodysplastic syndrome. It was found that 4 out of 825 cases of CMML had glomerulopathy showing amyloidosis or extracapillary proliferation with no infiltration of leukemic cells in the kidney.[8] Only a few cases of CMML showing leukemic cell infiltration in the

kidney have been reported in the world literature.[9-12] Among them, only one case formed a kidney mass,[9] which is similar to the present case.

The present case is the first case of rare clinical presentation of CML associated with renal involvement of leukemic cells, which forms a kidney mass and is associated with blastic transformation. Therefore, the differential diagnosis of a kidney tumor during the course of CML, especially in the time of blastic transformation, should take into account the possibility of an extramedullary localization of leukemic cells, although it is a very rare event.

Renal cell carcinoma rarely occurs in CML patients, but a few cases of renal cell carcinoma have been reported as a therapeutic complication after a busulfan treatment for CML.[13,14] The patient of the present case had renal cell carcinoma, but it had developed before the diagnosis of CML and was not associated with any treatment.

In the case of CMML involvement forming a kidney mass, a nephrectomy is not necessary, and chemotherapy remains the best therapeutic option, because most patients are in poor clinical condition.[9] This might be true in cases of CML, such as the present case. The patient of this case was well and without specific treatment 3 months after diagnosis of the renal tumor.

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