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CASE REPORT

T-Acute Lymphoblastic Leukemia/Lymphoma Manifesting as Acute Renal Failure

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SUMMARY

Background: **T-acute lymphoblastic leukemia/lymphoma (T-ALL/LBL) is a type of cancer that originates from immature blood cells committed to developing into T-cells. These cancerous cells multiply uncontrollably and can lead to the development of leukemia or lymphoma.**
Methods: **We describe a rare case of a 13-year-old male patient who presented with acute renal failure as the first manifestation of acute lymphoblastic leukemia/lymphoma.**
Results: **The patient was ultimately diagnosed with T-ALL/LBL based on a comprehensive diagnosis of bone marrow examination and biopsies of lymph nodes and kidneys.**
Conclusions: **It is uncommon for acute renal failure to be an initial indication of T-ALL/LBL, and a comprehensive diagnosis involving bone marrow and histopathology examinations is crucial for its accurate diagnosis.**
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KEYWORDS

acute lymphoblastic leukemia/lymphoma, acute renal failure, lymph nodes, bone marrow

INTRODUCTION

T-ALL/LBL is a form of cancer that begins in immature blood cells with a commitment to becoming T-cells. These malignant cells proliferate without control and may result in the onset of leukemia or lymphoma. Conventionally, the term "T-lymphoblastic leukemia" (T-ALL) is used when the cancer primarily affects the peripheral blood and bone marrow, while "T-lymphoblastic lymphoma" (T-LBL) is used when the cancer primarily affects the lymph nodes, thymus, or other non-marrow sites. When both the bone marrow and non-marrow sites are involved, the distinction between T-ALL and T-LBL becomes less clear, although many treatment protocols use a threshold of greater than 25% marrow blasts to define leukemia. T-ALL usually presents with a high number of white blood cells and often includes a large mass in the mediastinum or other tissues. Enlarged lymph nodes and an enlarged liver and

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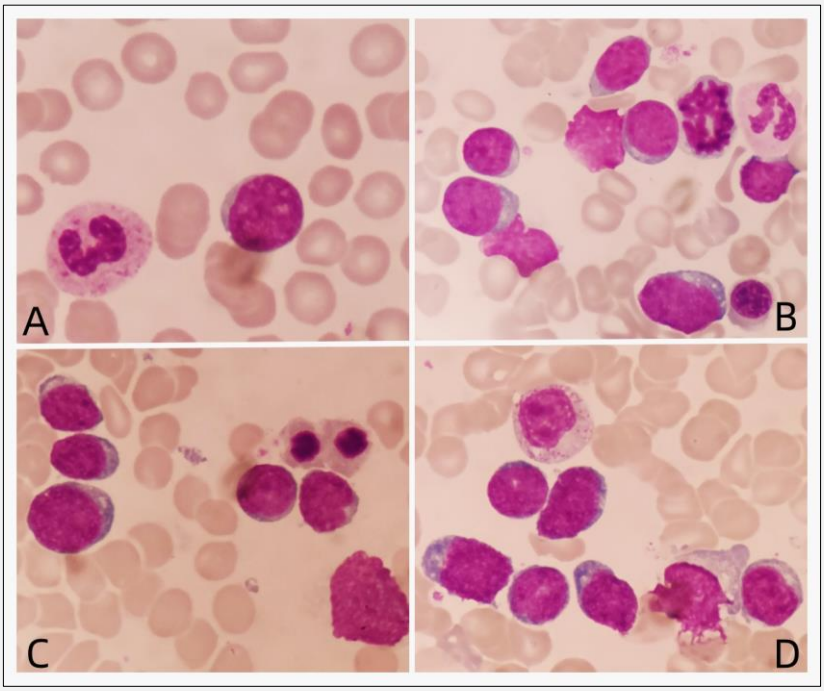

Figure 1. A - Primitive lymphocytes were identified in peripheral blood smears. B, C, D - Bone marrow aspirate smears revealed 42% primitive lymphocytes with finely detailed nuclear chromatin.

Wright-Giemsa stain, 100 x objective.

U-spleen are common. Compared to B-ALL, T-ALL often affects the bone marrow's ability to produce blood cells less severely for a given white blood cell count and tumor burden. T-LBL often appears as a mass in the front of the mediastinum, and it may grow rapidly, occasionally causing a respiratory emergency. The condition may also lead to the accumulation of fluid in the chest or around the heart. T-ALL represents around 15% of all childhood cases of acute lymphoblastic leukemia (ALL) and is more prevalent in adolescents than in younger children, with a higher incidence in males. In adult ALL cases, T-ALL accounts for about 25%. T-LBL makes up approximately 85 - 90% of all lymphoblastic lymphomas, with a higher frequency in adolescent boys, but it can occur in individuals of any age [1,2], Herein, we report an uncommon instance of a 13-year-old boy who initially presented with acute kidney failure as the primary indication of T-ALL/LBL.

CASE REPORT

A 13-year-old male patient was admitted to the hospital due to dizziness and difficulty standing or walking. Physical examination revealed high blood pressure (165/110 mmHg) and enlarged lymph nodes in the neck and behind the ears. Ultrasound showed diffuse renal lesions in both kidneys and multiple enlarged lymph nodes around the bilateral renal hilum and adjacent to the abdominal aorta. Hematological analysis revealed a hemoglobin level of 144 g/L, a white blood cell count of 10.3 x 10^9/L, and a platelet count of 243 x 10^9/L. Additionally, the patient's serum urea nitrogen, creatinine, uric acid, cystatin C, and lactate dehydrogenase levels were 11.26 mmol/L, 192 µmol/L, 594 µmol/L, 2.27 mg/L, and 603 U/L, respectively. Primitive lymphocytes were identified in peripheral blood smears (Figure 1A). Bone marrow aspirate smears revealed 42% primitive lymphocytes with finely detailed nuclear chromatin (Figure 1B, C, D). Flow cytometry results indicated that approximately 28.82% of the nuclear cells were occupied by the primitive cells. The cell group expressed CD99, CD1a, CD8, TdT, CD7, CD2, CD5, CD4, and cCD3, while also showing CD10 in a section expression and small expressions of CD3 and CD34. Notably, they did not express CD117, CD56, CD33, CD13, CD11b, CD15, CD19, CD20, or MPO. The flow results were consistent with the immunophenotype of T-ALL. The results of the bone marrow biopsy also suggested T-ALL. Following this, both the cervical lymph node and

renal biopsies indicated the possible presence of T-cell lymphoma. Therefore, the patient was ultimately diagnosed with T-ALL/LBL based on comprehensive diagnosis. The patient's family members chose to transfer him to a higher-level hospital for treatment.

DISCUSSION

T-cell acute lymphoblastic leukemia (T-ALL) makes up around 15% of childhood acute lymphoblastic leukemia (ALL) cases. It is more common in adolescents than in younger children and is more prevalent in males. In adults, T-ALL accounts for approximately 25% of ALL cases. T-cell lymphoblastic lymphoma (T-LBL) represents about 85 - 90% of all lymphoblastic lymphomas. Similar to T-ALL, it is most commonly seen in adolescent boys but can occur in any age group. T-cell acute lymphoblastic leukemia/lymphoma (T-ALL/LBL) often presents with a large mediastinal or other tissue mass. Lymph node enlargement and enlargement of the liver and spleen are common. Compared to B-cell ALL, T-ALL often has less impact on normal bone marrow function for a given level of cancerous cells. T-LBL typically presents with a mass in the front part of the chest, with rapid growth and occasionally leading to a respiratory crisis. Additionally, the condition may result in pleural and/or pericardial effusions [1,2].

To the best of our knowledge, a rare case of T-cell acute lymphoblastic leukemia/lymphoma (T-ALL/LBL) was reported with the initial presentation of acute renal failure [3]. A rare case of T-cell lymphoblastic lymphoma with exclusive renal involvement was described by Aydin Koker S, et al. [4]. Additionally, Rose A et al. documented a case where acute lymphoblastic leukemia relapse led to acute renal failure [5]. Furthermore, Kwakernaak AJ, et al. reported a case of precursor T-lymphoblastic lymphoma presenting as primary renal lymphoma with acute renal failure [6]. The case presentation featured acute renal failure as the main symptom, with T/ALL and T/LBL being diagnosed almost concurrently. We are unable to accurately determine the sequence of these two diseases. The proliferation and infiltration of leukemia or lymphoma cells in T-ALL/LBL are the main cause of acute renal failure. This case was quickly diagnosed through comprehensive diagnostics. Regrettably, the case was lost to follow-up. Further studies are needed to investigate the best treatment options, especially for patients with T/ALL and T/LBL simultaneously.

CONCLUSION

This case emphasizes the significance of employing a range of detection methods for a comprehensive diagnosis, including morphology, flow cytometry, and biopsy of bone marrow and histopathology examination.

Informed Consent:
Informed consent was obtained from the patient.

Declaration of Interest:
The authors declare there are no competing interests.

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