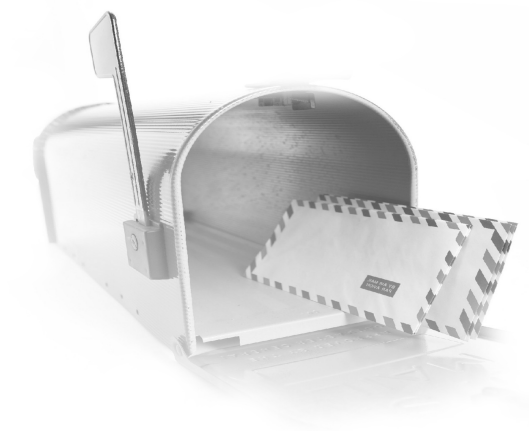

BLOOD RESEARCH
Volume 56 · Number 2 · June 2021

Letters to the Editor

Adult B-lymphoblastic leukemia initially presenting as multiple osteolytic lesions: caution in diagnostic approaches

TO THE EDITOR: Most patients with acute B-lymphoblastic leukemia (ALL) present with cytopenia, lymphadenopathy, and hepatosplenomegaly [1]. Osteolytic bone lesions are common in plasma cell myelomas and metastatic tumors, but they are rare in ALL patients, especially in adults [2]. Thus, the diagnosis is difficult, and an accurate diagnosis may be delayed when osteolytic lesions are the primary presentation in ALL. Here, we report a case of adult B-ALL initially presenting solely as multiple osteolytic bone lesions and discuss its clinical significance through a literature review. To our knowledge, this is the oldest patient case so far with infrequent and rare presentation of adult B-ALL.

A 78-year-old man was admitted for back pain. The magnetic resonance image of the spine, bone scan, and positron emission tomography-computed tomography showed malignant bone infiltration in the skull, whole vertebrae, ribs, pelvic bones, and a concurrent pathologic compression fracture in the thoracic vertebra. Simple radiography of the skull revealed multiple osteolytic lesions, suggesting the involvement of plasma cell myeloma (Fig. 1). A physical examination and computed tomography revealed the absence of hepatosplenomegaly and lymphadenopathy. The complete blood count at admission showed white blood cells, 6.06×10^9/L; hemoglobin, 10.2 g/dL; and platelets, 132×10^9/L. A peripheral blood smear demonstrated no circulating blasts or abnormal cells. The differential counts of leukocytes were as follows: neutrophil, 79%; lymphocytes, 12%; and monocytes, 9%. Serum total protein and albumin levels were 6.9 g/dL (reference range, 5.8–8.1 g/dL) and 4.4 g/dL (reference range, 3.1–5.2 g/dL), respectively. The serum creatinine level was 0.98 mg/dL (reference range, 0.5–1.2 mg/dL); lactate dehydrogenase level, 324 IU/L (reference range, 0-250 IU/L); and, calcium level, 9.98 mg/dL (reference range, 8.0–10.5 mg/dL). Serum and urine protein electrophoreses and immune-fixation electrophoresis showed no monoclonal bands, and the levels of free light chains in serum and urine were normal. Bone marrow aspiration showed 70.4% leukemic blasts with 75% cellularity in the biopsy (Fig. 1). The leukemic blasts expressed CD10, CD13, CD19, CD20, CD22, CD33, CD34, TdT, and cytoplasmic and surface immunoglobulins, consistent with B-cell lymphoblastic leukemia, a common cell type with aberrant expression of CD13 and CD33. A chromosomal analysis revealed 46,XY [20], and there were no detectable genetic abnormalities in the molecular test. He received radiation therapy only to the thoracic and lumbar spines because of his poor general condition. After radiation therapy, he was transferred to another hospital for conservative treatment.

One of the most important factors to be considered while evaluating lytic bone lesions is the age of the patient. In the elderly, differential diagnoses for multiple osteolytic lesions include histiocytosis, enchondroma, fibrous dysplasia, and hyperparathyroidism. In addition, metastatic malignancy and plasma cell myeloma should always be considered in middle-aged and elderly patients [3].

Multiple osteolytic bone lesions are a very rare presentation of adult B-ALL, and there have been only a few sporadic reports [2, 4-8]. Most reported patients showed diffuse and multiple osteolytic lesions, normal white blood cell counts without circulating blasts, mildly decreased hemoglobin and/or platelet count, and no organomegaly and/or lymphadenopathy [2, 4, 6-8]; these reports are consistent with those of our patient. The immunophenotype of leukemic blasts in our patient was a common cell type (CD19 and CD10 positive), a finding similar to those of other studies [2, 4, 8]. Furthermore, some studies have reported hypercalcemia accompanying elevated parathyroid related protein (PTHrP) [4-6]. However, our patient did not show hypercalcemia, which is consistent with a finding of another study [2]. A previous study found an association between t(17;19) translocation and osteolytic lesions in childhood ALL [9]; however, no significant genetic abnormalities have been reported in adult ALL patients with osteolytic lesions.

The mechanisms underlying osteolytic bone lesions in ALL are not well known. Some cases of osteolytic lesions

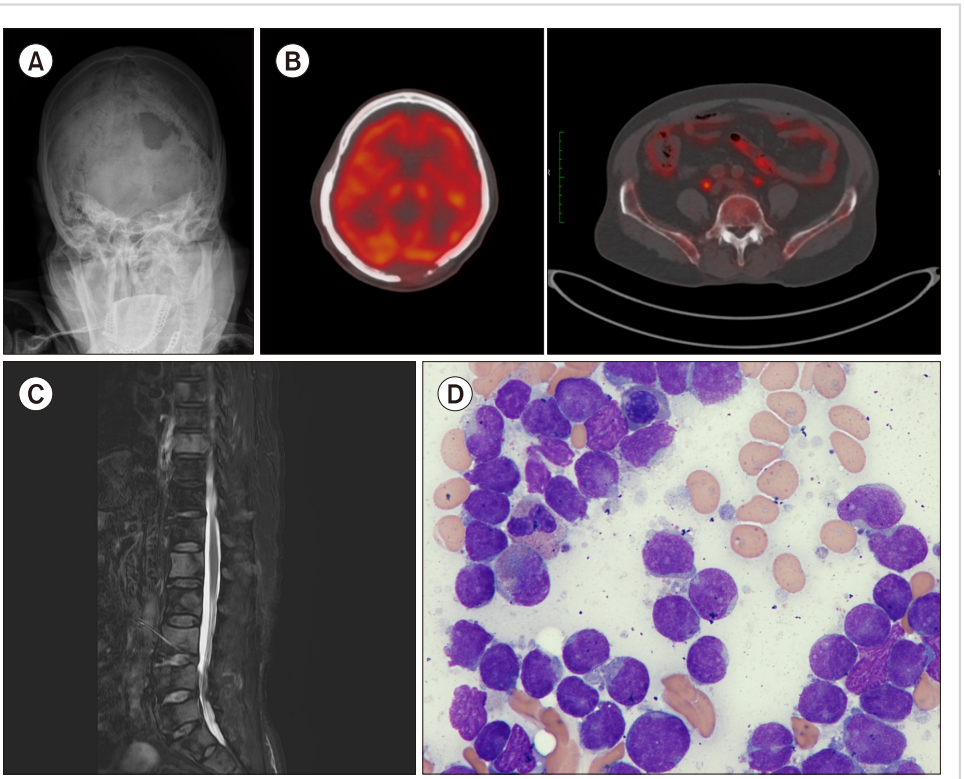

Fig. 1. Simple radiography of the skull **(A)**, positron emission tomography-computed tomography **(B)**, and magnetic resonance imaging showing multiple osteolytic lesions in skull **(C)**, vertebrae, rib, both pelvic bones, and a concurrent pathologic compression fracture in the thoracic vertebra; leukemic blasts observed in the bone marrow aspirate **(D)**.

caused by malignancy showed concurrent hypercalcemia possibly due to local bone destruction by direct invasion of the tumor or by increased osteoclastic activity through tumor-secreting factors such as PTHrP, interleukin (IL)-3, IL-6, and tumor necrosis factors [2, 4]. Among them, PTHrP production by B-ALL blasts has been considered a main cause of osteolytic lesions [2, 7]. In our case, however, we did not check the level of humoral factors; thus, we could not investigate the exact mechanism in our patient.

The prognostic effect of osteolytic lesions in ALL remains unclear. Although a few studies have reported improved survival in pediatric patients with ALL having osteolytic lesions due to better responsiveness to steroids [2, 10], there are no related studies on adults. Early suspicion and diagnosis may be the most crucial factors related to increased survival in adult patients with ALL with osteolytic bone lesions.

In conclusion, we report a very rare case of adult B-ALL that initially presented as multiple osteolytic lesions. Despite these atypical initial presentations, early recognition and treatment are essential for improving outcomes.

Bohyun Kim, Young Ahn Yoon, Young-Jin Choi
Department of Laboratory Medicine, Soonchunhyang University Cheonan Hospital, Soonchunhyang University College of Medicine, Cheonan, Korea

Correspondence to: Bohyun Kim
Department of Laboratory Medicine, Soonchunhyang University Cheonan Hospital, 31, Suncheonhyang 6-gil, Dongnam-gu, Cheonan 31151, Korea
E-mail: bhkim@schmc.ac.kr

Received on Jun. 21, 2020; Revised on Oct. 21, 2020; Accepted on Feb. 26, 2021

https://doi.org/10.5045/br.2021.2020144

Authors' Disclosures of Potential Conflicts of Interest

No potential conflicts of interest relevant to this article were reported.

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Polycythemia vera emerging eighteen years after acute myeloid leukemia diagnosis

TO THE EDITOR: Emergence of a *JAK2* V617F-positive myeloproliferative neoplasm (MPN) while in remission from acute myeloid leukemia (AML) is an exceedingly rare phenomenon with the MPN presenting as polycythemia vera (PV), essential thrombocythemia or MPN unclassifiable [1-3]. Of these infrequently reported cases, retrospective analysis of AML diagnostic material has shown that the *JAK2* V617F is sporadically present at this time demonstrating that this mutation can manifest phenotypically before or after AML presentation. Here we describe the clinical course of a patient in remission from AML in whom PV emerged eighteen years after initial diagnosis following fifteen years of disease free survival. We review those few similarly presenting cases from the *JAK2* V617F era in order to identify any salient features.

A 64-year-old female with a long standing history of systemic lupus erythematosus presented in 2002 with lethargy, tiredness and a cough. Full blood count showed anemia (Hb, 11.6 g/dL), neutropenia (0.2×10^9/L) and a normal plate-

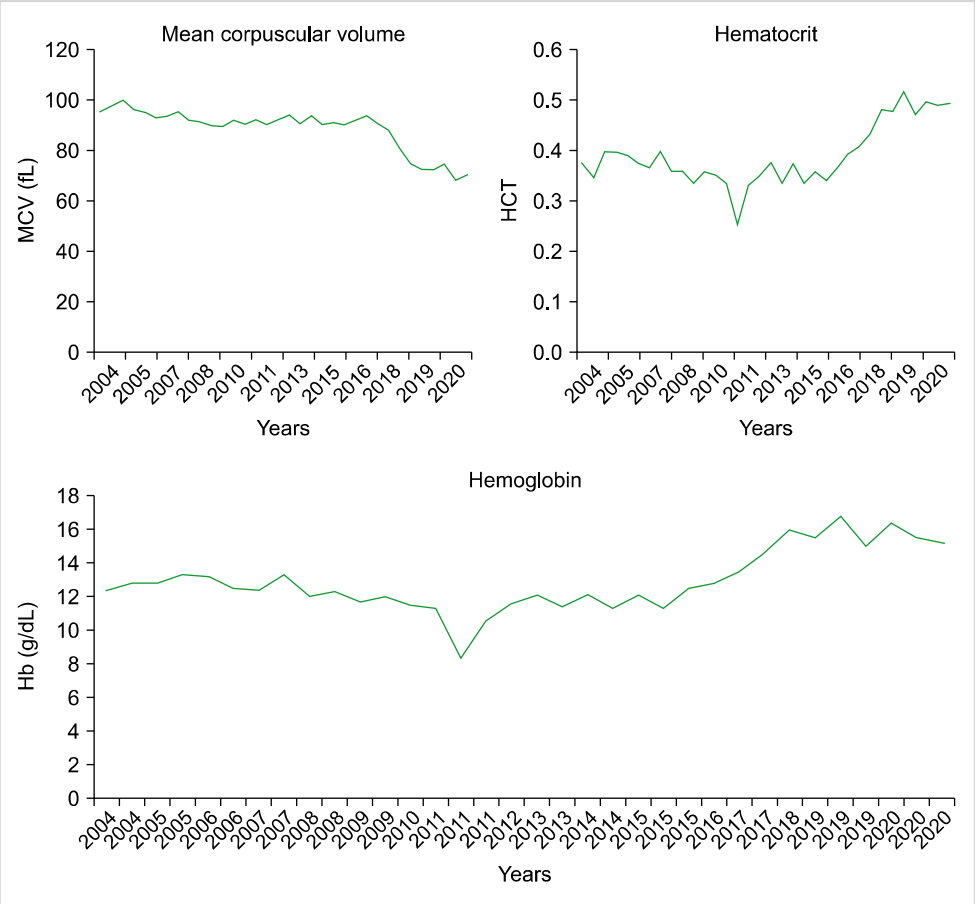

Fig. 1. Red blood cell indices of the patients throughout the clinical course.