

Rapid-Fire: Acute Blast Crisis/Hyperviscosity Syndrome

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KEYWORDS

- Blast • Leukostasis • Leukapheresis • Petechiae • Hyperviscosity
- Chronic myeloid leukemia • Acute myeloid leukemia • Hydroxyurea

KEY POINTS

- Blast crisis is usually seen in patients with acute and chronic myeloid leukemia.
- Clinical manifestations of blast crisis involve bone marrow infiltration (eg, anemia, thrombocytopenia, bleeding, bone pain, and immunosuppression) and hyperleukocytosis.
- Leukostasis is defined by symptomatic hyperleukocytosis with neurologic and/or pulmonary manifestations.
- DIC, tumor lysis syndrome, and leukostasis can happen in patients with hyperleukocytosis.
- Most cases of leukocytosis will have white blood cell counts greater than 100,000 with greater than 20% blast cells.

CASE: SHORTNESS OF BREATH

Pertinent History: The patient is a 45 year-old man presenting with several days of shortness of breath, cough, and low-grade fevers (up to 100.5°F). It is associated with a generalized headache that was gradual in onset, as well as generalized fatigue and malaise. He denies any associated chest pain, confusion, lethargy, nausea, vomiting, or diarrhea. He reports a gradual overall decline in his function over the last several weeks; he is currently able to complete only a few blocks of his usual daily 5-mile runs. He presents to the emergency department for evaluation of a possible cardiac cause of his symptoms. He denies tobacco or illicit drug use. He has no known past medical history and is currently on no medications (**Fig. 1**).

Pertinent Physical Examination: Blood pressure is 145/95. Pulse is 95; RR is 30, and SpO₂ is 87%. Temperature is 100.5°F.

General: The patient appears in mild distress.

Head, eyes, ears, nose, and throat: Gingival petechiae.

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Fig. 1. Petechiae. (Courtesy of C. Kaide, MD, Wexner Medical Center at The Ohio State University, Columbus, Ohio, USA.)

Neck: Supple. No meningismus.

Cardiovascular: Regular rate and rhythm. No murmurs, rubs or gallops.

Pulmonary/Chest: Crackles in all fields.

Abdominal: Non-tender, non-distended.

Neuro: Alert and oriented x3. Delayed reciprocity in speech. No focal weakness.

Skin: Scattered petechiae.

Extremities: No deformities.

Diagnostic testing: laboratory testing results were

WBC: 450K (99% Blasts)

HbB: 8.5

Plt: 23K

Na: 135

K: 5.8

HCO₃: 22

BUN: 35

Cr: 3.2

Ca: 6.4

PO₄: 5.5

LDH: 600

Uric Acid: 6.2

Chest radiograph showed bilateral interstitial infiltrates.

Computed tomography of the chest showed bilateral parenchymal infiltrates and ground glass opacities. There were no pulmonary emboli.

Diagnosis is acute blast crisis with leukostasis.

The plan is volume expansion with intravenous fluids, STAT hematology consultation for leukaphoresis, admission, and chemotherapy.

LEARNING POINTS: BLAST CRISIS AND HYPERVISCOSITY (LEUKOSTASIS)

Introduction/Background

1. Blast crisis is (variably) defined by the presence of greater than 20% of peripheral or bone marrow blast cells. Blast cells refer to early hematopoietic cells from the lymphoid (lymphocytes) or myeloid (erythrocytes, thrombocytes, monocytes, neutrophils, basophils, eosinophils) cell lines. Healthy bone marrow should contain no more than 5% blast cells. Normal peripheral blood should contain no blasts (**Fig. 2**)

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