

Leukemoid Reaction in a young woman following a TAH-BSO with severe hemorrhage: A case report

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Leukemoid Reaction in a young woman following a TAH-BSO with severe hemorrhage: A case report

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Key Clinical Message

Leukemoid reaction may result from acute stressors such as a major surgery but other etiologies such as lymphoproliferative disorders, infections and neoplasia must be ruled out. Individualized intensive care prevents multi organ damage and lowers the counts.

Abstract

We reported a case of a 26 years female admitted to ICU with severe anemia, leukocytosis with left shift and thrombocytosis- likely leukemoid reaction. No evidence of any infectious etiology or solid tumors was found. The priority of management was prevention of multi-organ damage with intensive and individualized care.

Keywords

Hemorrhage, leukocytosis, leukemoid reaction, thrombocytosis.

Introduction

A reactive leukocytosis, with a significant increase in early neutrophil precursors, exceeding 50,000/mm³ is referred to as a leukemoid reaction[1]. The major causes of a leukemoid reaction include paraneoplastic

manifestation of several cancers such as lung, gastrointestinal, genitourinary, ovarian, head and neck cancers and hepatocellular carcinoma[2,3], severe infections, intoxications, corticosteroid administration, severe haemorrhage and acute haemolysis[4,5]. The differential diagnosis of a leukemoid reaction in patients is often a true challenge. Diagnostic work-up must be able to differentiate underlying causes from acute and chronic leukaemia[6]. These reactions have been attributed to increased cytokine production[7]. The cytokines implicated in this process include granulocyte-macrophage colony-stimulating factor (CSF), granulocyte-CSF (G-CSF), interleukin-3 (IL-3) and IL-6[8,9]. Most leukemoid reactions are seen in senior patients and are associated with a poor prognosis[10]. Here, the case of a young woman who had severe clinical symptoms, a leukemoid reaction after major surgery, and who progressed to a good outcome in the end, is presented.

Case Presentation

A twenty-six years P5L5 lactating female, status post total abdominal hysterectomy (TAH) with bilateral salpingo-oophorectomy (BSO) on her 4th post-operative day presented to emergency with complaints of paleness, documented fever of 103F without chills and rigors for 2 days and bleeding from the surgical drainage site since 3rd postoperative day. She was referred from another setting in the wake of an abrupt fall in hemoglobin percentage likely due to massive bleeding from the drainage site due to slippage of ligature and self-pullout of the drain. No other significant history was noted at the time of admission. On examination, she appeared ill but was conscious with well orientation to time, place and person and 15/15 on the Glasgow Coma scale (GCS). Findings included pallor in the conjunctiva and pale-looking skin, tachycardia with 128 bpm, regular, tachypnea with 28 breaths/min, and a temperature of 100 F. Her abdominal examination revealed a non-distended abdomen with a midline vertical incision on the lower abdomen, clean without pus or inflammation, with a drain site that was soggy and tender, and without any significant CNS, CVS or respiratory system findings. [Fig.1]. She had undergone elective TAH with BSO for a single hypoechoic lesion of 32.88mm at the left adnexa [Fig.2,3]. At ER, she was managed with IV antibiotics, antipyretics, PPI and one pint of whole blood transfusion, the blood and urine samples were sent for further investigations. The detailed compared laboratory findings of the patient at the time of admission to that before the surgery is tabulated in

Table 1.

The lab findings showed a drastic increase in the number of WBCs (97,610 cells /cumm) along with derangements in PCV, MCV, ESR/CRP, RBC count, platelet count and abnormal iron studies. Electrolytes measurement showed hypokalemia with typical ECG features [Fig. 3]. Ultrasonography showed splenomegaly of size 15cm. The patient was then admitted to the medicine ICU where the serial CBC and electrolytes monitoring was done the results of which are tabulated in Table 2. The peripheral smear performed on the day of admission showed 97,600 cell counts with 36% hyper-segmented neutrophils, 14% band cells, 10% promyelocytes, 20% myelocytes, 8% metamyelomyelocytes, 8% lymphocytes, 4% basophil with microcytic hypochromic anemia and anisocytosis with giant platelets likely thrombocytosis and left shift suggestive of leukemoid reaction [Fig.4]. The patient had total 3 spikes fever for 2 days post admission, with max documented temperature of 102.2 F. No source of infection was clinically identified. Tests for infective etiology like Scrub typhus, dengue fever, and malaria tests reported negative. Blood culture, high vaginal swab and urine culture did not show growth of any organisms after 48 hours. At ICU, she received 2 pints whole blood transfusion and was managed with injectible antibiotics for covering post-operative sepsis.

Since 4th day of admission, she started complaining of a burning sensation in her hands and feet and headache, following which Inj Clexane was prescribed. Other signs of hyperviscosity syndromes were absent. The patient was under constant monitoring for signs of hyperviscosity and was mobilized. On the 5thDOA, the lab parameters showed hemoglobin of 7.6 gm/dl, WBC count - of 1,66,690 cells/cumm and platelet count of 1,111,000 cells/cumm, thus in order to rule out leukaemia, bone marrow aspiration was planned. Fluid intake was increased. The patient was under further management but due to some financial problems, the patient's caregivers requested discharge against medical advice. She was advised to follow-up.

Discussion

Leukemoid reaction is an inflammatory stimulus originating outside bone marrow, that occurs due to causes like clostridium infection, disseminated tuberculosis, drugs (corticosteroids, lithium, colony-stimulating factors), neoplasm (carcinoma, sarcoma), and hemorrhage. It shows a close resemblance with CML, thus the patient requires tests like PBS, Bone marrow biopsy for exclusion of the alternate diagnosis. The course of her stay revealed the likely etiology of leukemoid reaction was due to severe hemorrhagic shock due to drain slippage with status TAH-BSO. The increasing trend of the cell counts demanded bone marrow aspiration finding that could not be performed because the patient left against medical advice. Failure to obtain BM and complete the management of the patient at the hospital is the limitation of the report. The detailed report of this rare case in our setting will help us deal with similar cases with a more evidence-based and systematic approach in future and hence the novelty lies within the detailed note of the case.

Similar to our findings, a case reported by Samaha G et. al, showed increasing titres of total count peaking to 78,000 with the finding of leukemoid reaction with thrombocytosis in a patient with severe hypovolemic shock with stage IV pancreatic cancer^[11]. A prospective study done in 2019, showed that leukemoid reactions were mostly due to infections, severe bleeding, malignancy and medications.^[12]

A cohort study conducted on Leukemoid reaction showed a majority of true leukemoid reactions were due to infection, neoplasms, and paraneoplastic reaction.^[13] Case reports on severe covid 19 patients showed rare findings of leukemoid reaction irrespective of age, and were associated with high mortality.^[14,15]

Conclusion

This case represents hemorrhagic shock with severe leukemoid reaction. Besides the demargination of neutrophils, hypoxia and stress hormones might have stimulated the bone marrow to produce substances with colony-stimulating activity, leading to a multifactorial leukemoid reaction. Recognition of this hematological condition in the context of hemorrhagic shock might help decrease unnecessary testing and expose patients to antibiotic therapy.

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Conflict of Interest

The authors declared no conflict of interest.

Consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy

Authorship details

1. **Leeza Shah** : Corresponding author, involved in patient care, involved in the literature review, manuscript writing and proofreading
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Abbreviations

TAH - Total Abdominal Hysterectomy

BSO - Bilateral Salpingo-oophorectomy

CML - Chronic Myeloid Leukemia

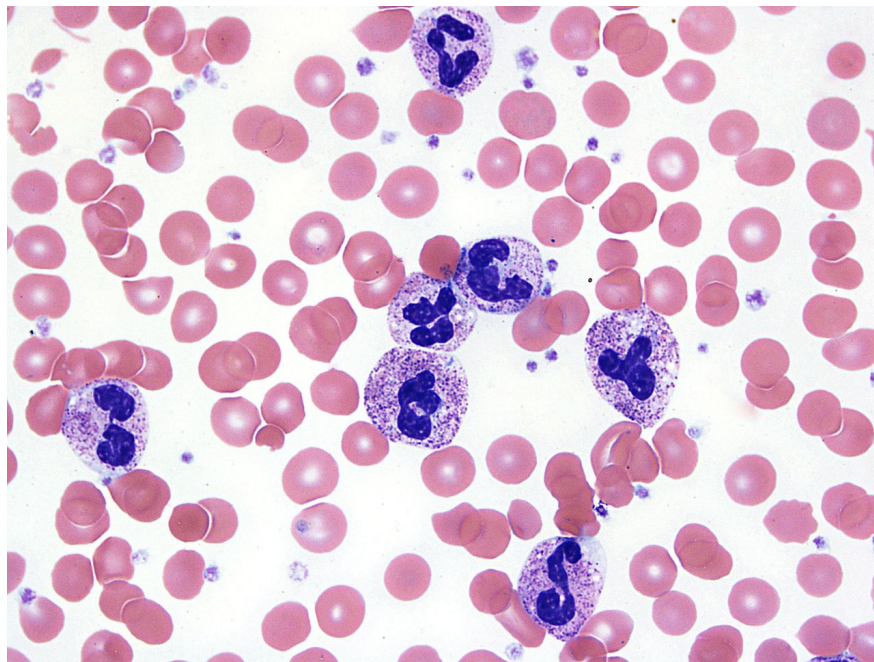
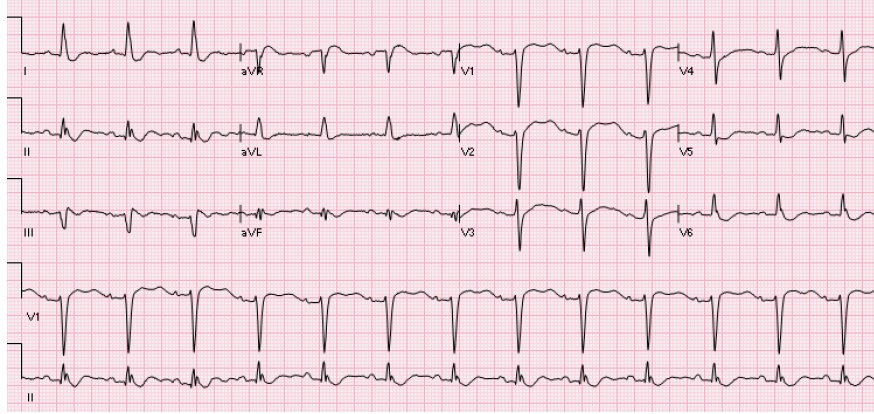
CRP - C Reactive Protein
DOA - Day of Admission
ECG - Electrocardiograph
ESR - Erythrocyte Sedimentation Rate
GCS - Glasgow Coma Scale
HBsAg - Hepatitis B surface Antigen
HDU - High Dependency Unit
HIV - Human Immunodeficiency Virus
HPF - High Power Field
ICU - Intensive Care Unit
L - Living
MCV - Mean Corpuscular Volume
OPD - Outpatient Department
P - Para
PCV - Packed Cell Volume
RBC - Red Blood Cell
TIBC - Total Iron Binding Capacity
VDRL - Venereal Disease Research Laboratory
WBC - White Blood Cell

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