Received: 20 February 2020 | Revised: 27 April 2020 | Accepted: 15 May 2020

DOI: 10.1002/ccr3.3011

CLINICAL IMAGE

Clinical Case Reports Open Access WILEY

Erythrocyte hemighosts in a patient with tumor lysis syndrome: One train may hide another

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Abstract

Rasburicase was introduced to treat hyperuricemia secondary to tumor lysis syndrome. Because of severe hemolytic anemia, a blood smear was requested and showed hemighosts, revealing G6PD deficiency. Erythrocyte morphology is a key tool in laboratory hematology.

KEYWORDS

G6PD deficiency, hematology, hemolytic anemia, methemoglobin, venetoclax

A 50-year-old man was diagnosed with chronic lymphoid leukemia with trisomy 12 and deletion 17p. A rapid increase of the lymphocyte count led to the decision to treat, and venetoclax was introduced. The patient rapidly developed tumor lysis syndrome with hypocalcemia, hyperphosphoremia, and hyperuricemia (493 µmol/L) and was treated by rasburicase and hyperhydration. Oxygen desaturation at 70% was found together with methemoglobinemia of 9.4%, thrombocytopenia of 112 × 10^9/L and severe hemolytic anemia (hemoglobin 5.6 g/dL, reticulocytes 78 × 10^9/L, low haptoglobin, LDH 2905 U/L). A blood smear was requested by laboratory hematologist and revealed red cells with irregular hemoglobin repartition and damaged membrane, also known as hemighosts (Figure 1, Panel A-C), a hallmark of severe oxidative injury frequently found in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency. Diagnosis was confirmed by enzymatic dosage, and treatment was switched to allopurinol. Detailed patient interview revealed Caribbean-born ascendants, and molecular analysis showed G6PD A- mutant.

Erythrocyte morphology was essential to evoke G6PD deficiency in emergency. Rasburicase is an oxidative drug

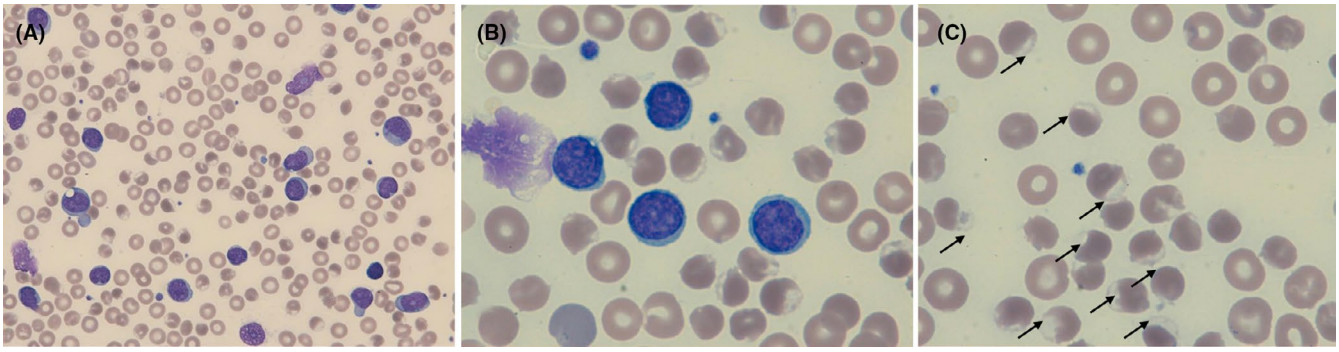

FIGURE 1 Blood smear of the patient. The blood smear shows numerous lymphocytes and lysed cells in accordance with the CLL diagnosis, as well as red blood cells with damaged membrane and a clear peripheral zone called hemighosts (arrows in panel C). May-Grünwald-Giemsa staining. A, total magnification ×500. B-C, total magnification ×1000

contraindicated in G6PD deficiency that induced intravascular hyperhemolysis and promoted methemoglobin formation[1] through oxidation of heme iron to the ferric state. G6PD enzymatic dosage should be considered before rasburicase introduction.[2]

CONFLICT OF INTEREST

None.

AUTHOR CONTRIBUTIONS

PC: performed research and analyzed data. SD: performed research and analyzed date. VB: coordinated the study, wrote the paper, and supervised analysis.

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How to cite this article: Cabantous P, Daliphard S, Bobée V. Erythrocyte hemighosts in a patient with tumor lysis syndrome: One train may hide another. *Clin Case Rep*. 2020;8:2069–2070. https://doi.org/10.1002/ccr3.3011