who presented with MAHA, thrombocytopenia, and renal failure who had negative testing for thrombotic thrombocytopenia (TTP) and ST-hemolytic-uremic syndrome and was subsequently found to have cobalamin C deficiency due to an MMACHC mutation. Treatment with high-dose Vitamin B12, betaine, and folic acid resulted in a dramatic recovery. His brother had died from complications of a similar syndrome at the same age.\[4,5\]

Acquired severe Vitamin B12 deficiency can cause thrombocytopenia and ineffective erythropoiesis, which may be accompanied by hemolysis and red blood cell morphology resembling MAHA. Homocysteine and methionine level are recommended by some authors in the workup of MAHA and TTP cases.\[3-5\]

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**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Chhabra N, Lee S, Sakalis EG. Cobalamin deficiency causing severe hemolytic anemia: A pernicious presentation. Am J Med 2015;128:e5-6.
2. Dimond A, George JN, Hastings C. Severe Vitamin B-12 deficiency in a child mimicking thrombotic thrombocytopenic purpura. Pediatr Blood Cancer 2009;52:420-2.
3. Tadakamalla AK, Talluri SK, Besur S. Pseudo-thrombotic thrombocytopenic purpura: A rare presentation of pernicious anemia. N Am J Med Sci 2011;3:472-4.
4. CorneL Le Gall E, Delmas Y, De Parscau L, Doucet L, Ogier H, Benoist JF, et al. Adult-onset eculizumab-resistant hemolytic uremic syndrome associated with cobalamin C deficiency. Am J Kidney Dis 2014;63:119-23.
5. Grangé S, Bekri S, Artaud-Macari E, Francois A, Girault C, Poitou AL, et al. Adult-onset renal thrombotic microangiopathy and pulmonary arterial hypertension in cobalamin C deficiency. Lancet 2015;386:1011-2.
Hematology clinicopathological exercise

Case Presentation

A 15-year-old male admitted to the Haematology Department of Baghdad Teaching Hospital with a history of severe anemia and splenomegaly since early childhood that required multiple packed cell transfusions. He was previously diagnosed as hereditary spherocytosis because of splenomegaly and the positive family history of the disease in his family. He visited the Thalassemia Centre of Ibn Al-Baladi Hospital in Baghdad, and hemoglobin electrophoresis and hemoglobin H preparations were repeatedly normal. Complete blood picture showed anemia with normal reticulocyte count and normal mean cell volume, mean cell hemoglobin, and mean corpuscular hemoglobin concentration with many nucleated red blood cells but no spherocytosis. Bone marrow aspiration [Figure 1a and b] and its iron stain [Figure 2] were illustrated.

Questions

1. Describe the bone marrow findings
2. What is the most likely diagnosis?

Answers

1. Figure 1a shows bone marrow aspirate with two erythroblasts having binuclearity, one with trinuclearity and one with multinuclearity. Figure 1b shows erythroblasts with intercytoplasmic bridging. Figure 2 shows iron stain of the bone marrow aspirate fragment with increased iron in store (iron overload)
2. These bone marrow findings together with the patient’s history of transfusion-dependent anemia with positive family history and the presence of splenomegaly and bone marrow findings of dyserythropoiesis and iron overload pointed to the diagnosis of congenital dyserythropoietic anemia (CDA). The presence in the bone marrow of bi-, tri-, and multi-nuclearity and intercytoplasmic bridging [Figure 1] referred to the diagnosis of type II CDA.

The CDAs are autosomal recessive bone marrow failure syndromes marked by morphological abnormalities in erythroblasts (dyserythropoiesis).

Many patients who have CDA have spent years with an incorrect diagnosis of hemolytic anemia, myelodysplasia, iron deficiency anemia, thalassemia, erythrocyte membrane abnormality, or hemochromatosis. This has exposed the patients to potentially harmful iron supplements, aggressive transfusion or steroids, and cocktails of vitamins. CDAs also present varied management challenges because the ineffective erythropoiesis can be associated with severe iron overload (with secondary organ dysfunction), cholelithiasis, and hepatosplenomegaly.[3]

The key to correct diagnosis is congenital anemia associated with suboptimal reticulocyte response and abnormal bone marrow red cell precursors.

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Reference

1. Renella R, Wood WG. The congenital dyserythropoietic anemias. Hematol Oncol Clin North Am 2009;23:283-306.
Erratum: Comparative behavior of red blood cells indices in iron deficiency anemia and β thalassemia trait

In the article titled “Comparative behavior of red blood cells indices in iron deficiency anemia and β thalassemia trait” published in pages 183-186, issue 2, vol. 5 of Iraqi Journal of Hematology[1], the sentence in the fourth paragraph under the heading “Discussion” is written incorrectly as “Most patients with β-TT have mild anemia (Hb level is rarely >9.3 g/dl).”. The sentence should be read correctly as “Most patients with β-TT have mild anemia (Hb level is rarely <9.3 g/dl).”

Reference

1. Jassim AN. Comparative behavior of red blood cells indices in iron deficiency anemia and β-thalassemia trait. Iraqi J Hematol 2016;5:183-6.

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We look forward to see you at Baghdad.

Organizing Committee

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