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CONTINUING MEDICAL EDUCATION
ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Hematology Quiz – Case 69

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ΑΡΧΕΙΑ ΕΛΛΗΝΙΚΗΣ ΙΑΤΡΙΚΗΣ 2025, 42(2):285–288

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An 82-year-old woman was referred by her family physician for evaluation of macrocytic anemia. She had had a series of investigations including computed tomography (CT) scans of the chest, abdomen and pelvis, as well as gastroscopy and colonoscopy which revealed no abnormal findings. A complete blood count showed a hemoglobin level of 10.5 g/dL, with mean corpuscular volume (MCV) 105 fL, mean corpuscular hemoglobin (MCH) 32 pg, mean corpuscular hemoglobin concentration (MCHC) 30 g/dL, and red blood cell distribution width (RDW) 14%. The white-blood-cell and platelet counts were normal. The reticulocyte count was 1.7% (0.5–2). Laboratory examinations showed normal serum creatinine (1.0 mg/dL), total bilirubin 1.1 mg/dL (0.2–1.2), lactate dehydrogenase (LDH) 200 U/L (134–279), alanine aminotransferase (ALT) 32 U/L (0–55), aspartate aminotransferase (AST) 46 (5–34), alkaline phosphatase (ALP) 99 U/L (40–150), fibrinogen 212 mg/dL (200–400), and international normalized ratio (INR) 1.1 (0.8–1.2). Serum ferritin concentration was 36 ng/mL (reference range: 17–204), with a vitamin B12 level of 900 pg/mL (reference range: 170–590) and a folic acid level of 4.12 ng/mL (1.5–5.5). The results of serum protein electrophoresis and thyroid function tests were normal. The direct and indirect antiglobulin tests were negative. Images of the peripheral blood (figures 1–5) and the bone-marrow aspirate (figures 6–15) are shown.

Comment

In the peripheral blood film, many stomatocytes, occasional uniform round macrocytes, and hypersegmented neutrophils were found (figures 1–5). The bone marrow aspirate smears show megaloblastic change with giant metamyelocytes (fig. 7) and striking cytoplasmic vacuolization of proerythroblasts (figures 8–13). Iron stores were decreased (fig. 14), but coarse intracellular siderotic granules were

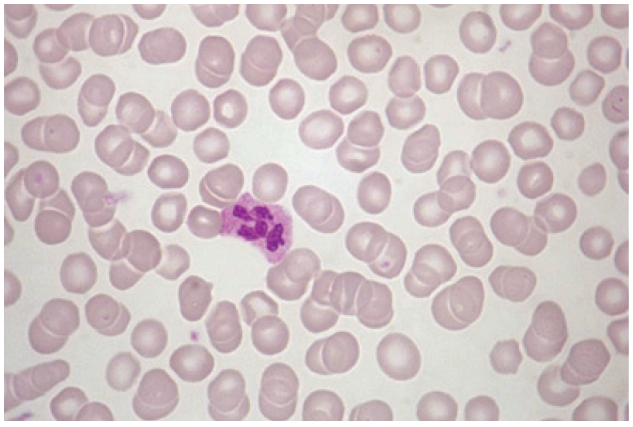

Figure 1.

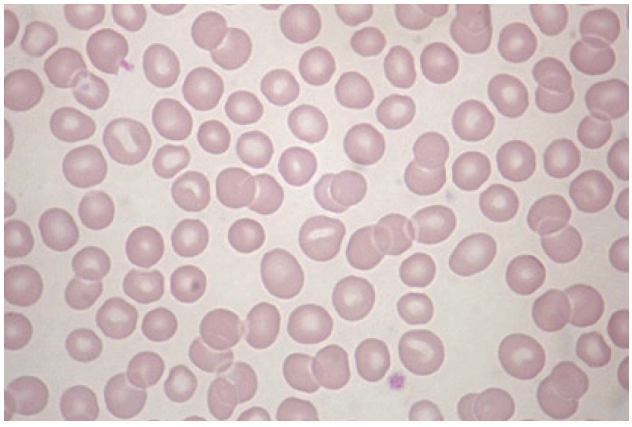

Figure 2.

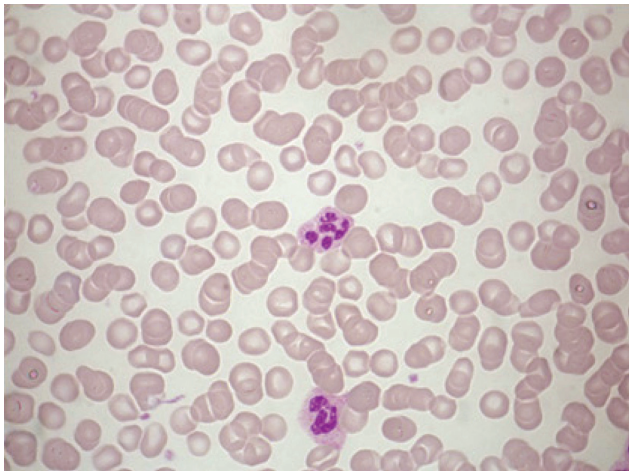

Figure 3

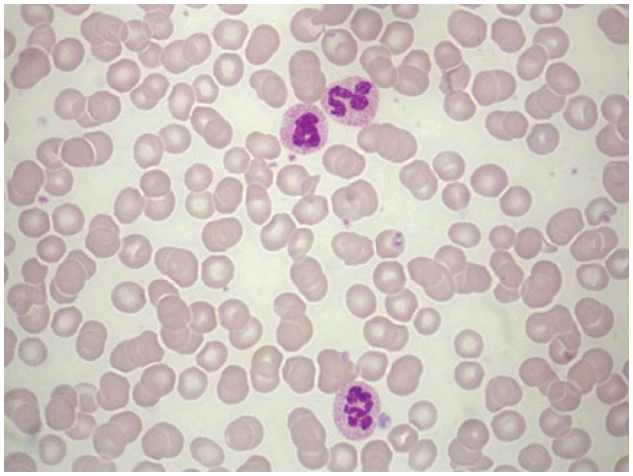

Figure 4

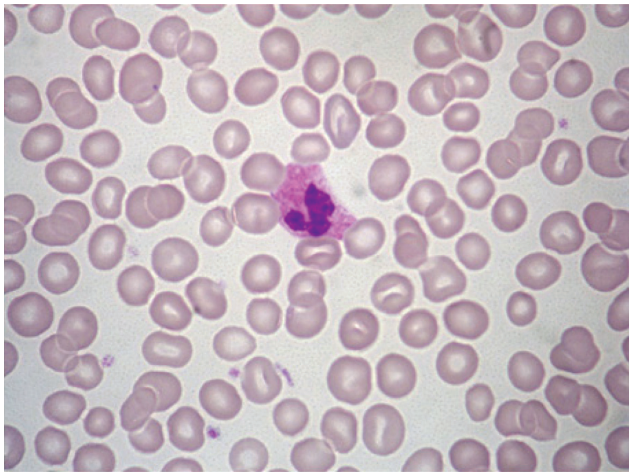

Figure 5

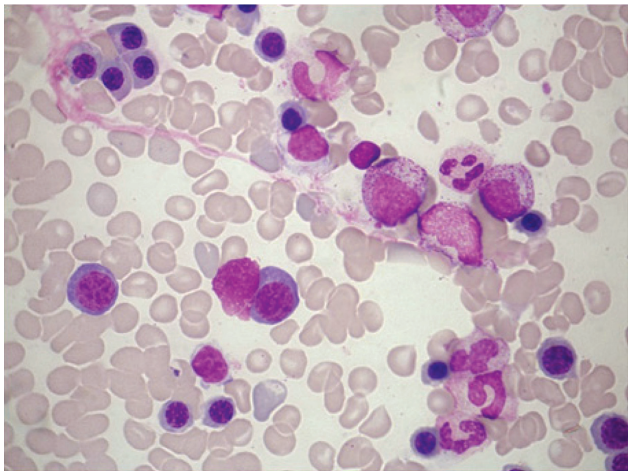

Figure 6

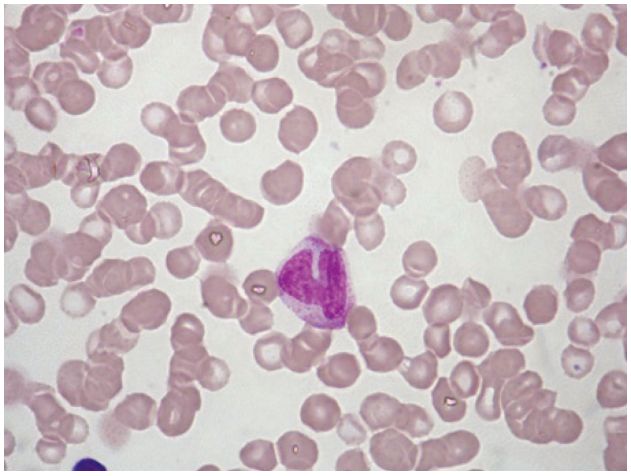

Figure 7

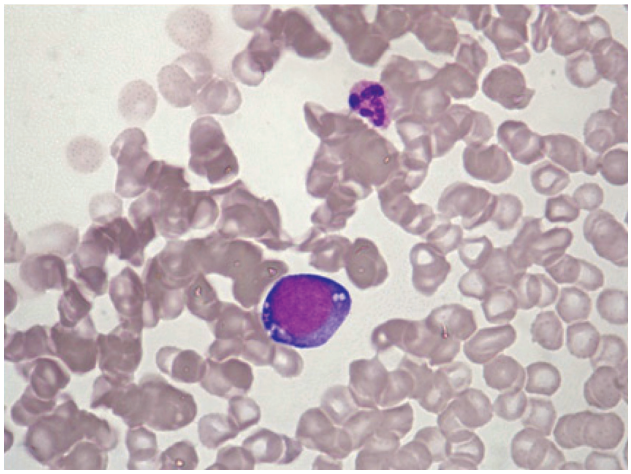

Figure 8

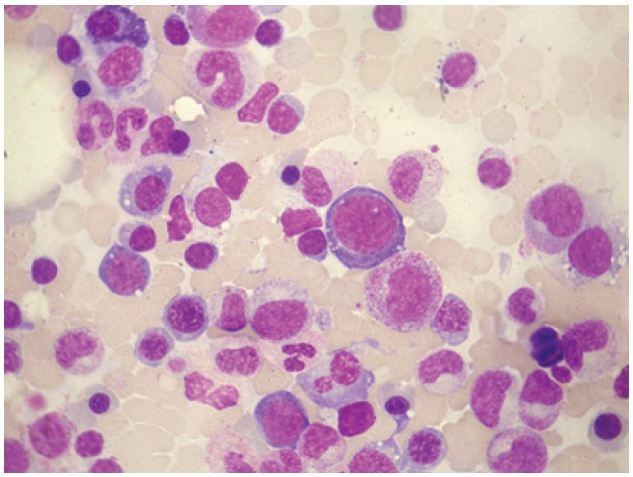

Figure 9

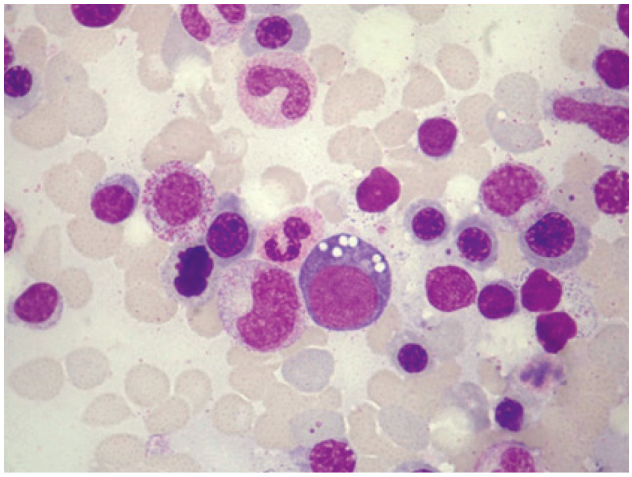

Figure 12

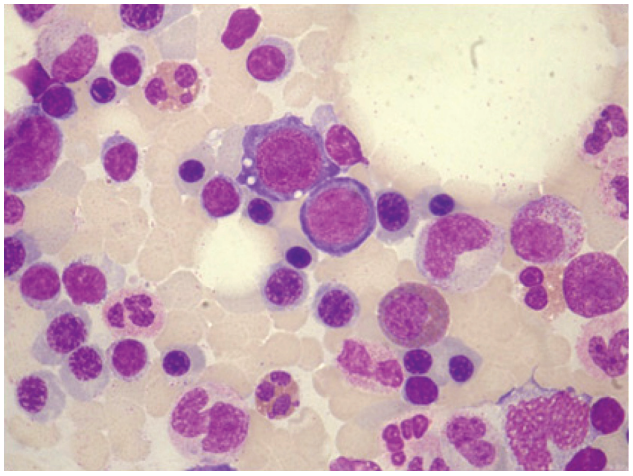

Figure 10

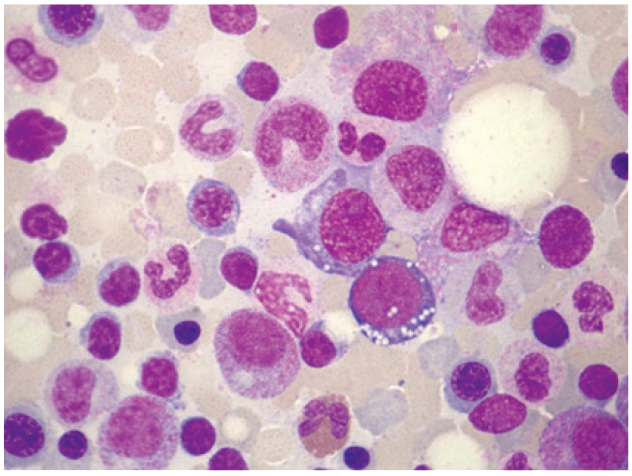

Figure 13

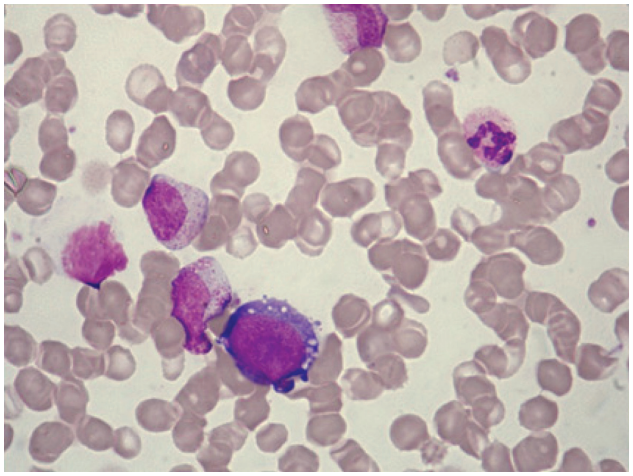

Figure 11

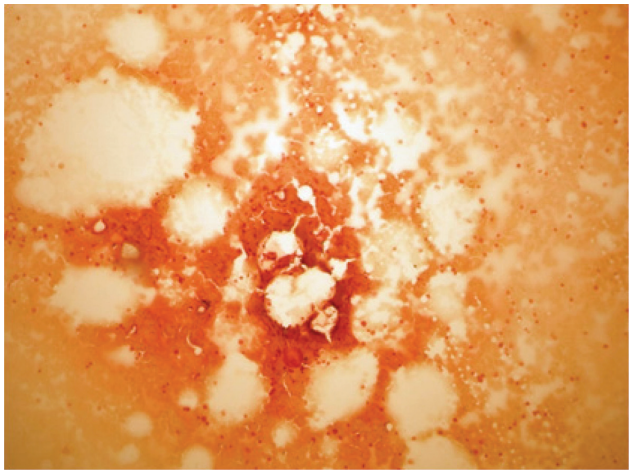

Figure 14

noted inside the developing erythroblasts (fig. 15). The combination of macrocyticanemia with a normal RDW, stomatocytosis, megaloblastosis, and vacuolization of proerythroblasts is highly suggestive of alcohol toxicity. Additional details of the history were obtained, and the patient reported drinking 100 g of ethanol a day.

Excessive alcohol consumption is often associated with anemia. Iron deficiency anemia is the commonest cause, and its etiology is multifactorial. Occult or overt blood loss is a common cause of anemia in persons with a history of excessive consumption of alcohol and occurs primarily in the gastrointestinal tract. Another common cause is folic acid (and other vitamin) deficiency attributed to associated malnutrition. Moreover, alcohol can directly impact red blood cell production and cause anemia by inducing sideroblastic change or by affecting early erythroid precursors causing characteristic cytoplasmic vacuolization and reducing their number, as in our patient. Hemolysis may be another cause in cases of spurcellanemia or Zieve's syndrome. Hypersplenism associated with alcoholic liver disease (particularly alcoholic cirrhosis) can increase premature erythrocyte destruction.

From a morphology point of view, it should be noted that the commonest cause of stomatocytosis is excess alcohol consumption and alcoholic liver disease; in these cases, there is often associated macrocytosis. Vacuolization of early erythroblasts has been described in the following conditions: Acute alcoholism, chloramphenicol toxicity, prolonged linezolid use, riboflavine deficiency, copper deficiency, pure erythroid leukemia, myelodysplastic syndrome (Di Guglielmo's syndrome), Vexas syndrome, Pearson's syndrome, phenylalanine deficient states, marasmus and kwashiorkor. The mechanism of vacuole formation in this patient might be due to mitochondrial injury induced by acetaldehyde, an alcohol metabolite. Vacuolation of promyelocytes has been seen less consistently, and only with large doses in acute alcoholism.

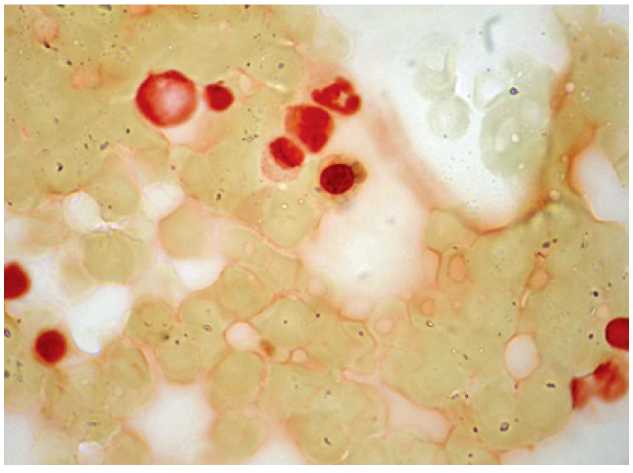

Figure 15

As is often noted, if the diagnosis is not suspected on the basis of the history, it will probably not be made. Obtaining a thorough history from most patients requires time and patience. But by doing so, the clinician is more likely to make the correct diagnosis. It is well recognized that, in the majority of cases, the diagnosis can be made after history taking alone. A classic study performed in 1975 to determine the relative value of the history, physical examination, and laboratory testing in making diagnoses found that the correct diagnosis was determined after the completion of solely the history in 82% of patients. A similar study performed in 1992 yielded almost identical results, with the history leading to the correct diagnosis in 76% of the cases.

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