A 20-year-old woman was admitted for severe asthenia. Physical examination was normal except for pallor. Laboratory findings were as follows: Hb 6.2 g/dL, MCV 119 fL, leukocytes 9.2x10^9/L, neutrophils 4.75x10^9/L, lymphocytes 2.21x10^9/L, eosinophils 0.17x10^9/L, platelets 159x10^9/L, reticulocytes 66x10^9/L, nucleated red blood cells: 28%, lactic dehydrogenase level 13,300 U/L (normal value < 350). The peripheral blood film showed numerous dacryocytes (Figure 1). What is your differential diagnosis?

The presence of tear-drop shaped erythrocytes suggested a diagnosis of myelofibrosis; in fact, there was no splenomegaly and the MCV was very high and neutrophils were hypersegmented (Figure 2). Cytological study disclosed hypercellular bone marrow which was erythroid and megaloblastic with giant metamyelocytes, in keeping with a vitamin B₁₂ deficiency (Figure 3). A diagnosis of pernicious anemia was confirmed in our patient by the following results: vitamin B₁₂ deficiency (27 ng/mL, normal value >200), gastric atrophy, abnormal Schilling test and positive intrinsic factor antibody.

Figure 1. Peripheral blood: numerous dacryocytes.

Figure 2. Peripheral blood: hypersegmented neutrophils and nucleated red blood cells (RBC).

Figure 3. Bone marrow: megaloblastic erythroid series.