Non-Megaloblastic Pernicious Anemia with Normoblasts Possessing Cytoplasmic Bridge

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An 84-year-old man was found to have macrocytic anemia with a hemoglobin concentration of 85 g/L and mean corpuscular volume of 127.0 fl. The white blood cell count was 3.6×10^9/L and the platelet count 134×10^9/L. The peripheral blood smear showed macroovalocytes and hypersegmented neutrophils. The bone marrow aspiration revealed normoblastic erythroid hyperplasia, Howell-Jolly bodies in normoblasts and giant metamyelocytes. In those normoblasts at each maturation stage, cytoplasmic bridges were noted at a high frequency (Picture 1A: normoblasts with Howell-Jolly body and cytoplasmic bridge. 1B: giant metamyelocyte. 1C and 1D: normoblasts with cytoplasmic bridge). Megaloblasts were rarely observed. The plasma vitamin B12 level was 62 pmol/L (reference range, 172-676) and folate 43 nmol/L (8-29). The anti-intrinsic factor and gastric parietal cell antibodies were both positive. Vitamin B 12 injection was started with a brisk increase in the reticulocyte count.

Megaloblastosis resulting from “nuclear-cytoplasmic asynchrony” is the morphologic hallmark of pernicious anemia (PA) and a sign of ineffective erythropoiesis. In the present...
patient megaloblasts were only rarely observed while normoblasts with cytoplasmic bridge were frequently observed. In the literature, non-megaloblastic PA has been reported. Normoblasts with cytoplasmic bridge have been also reported in patients with myelodysplastic syndromes and paroxysmal nocturnal hemoglobinuria. However, to our knowledge, non-megaloblastic PA with normoblasts with cytoplasmic bridges has not been reported except for the one we previously reported (1). Although speculative, the presence of cytoplasmic bridges may indicate dysfunctional DNA synthesis, similar to megaloblastic changes, leading to defective cell division and eventual apoptosis of normoblasts, namely ineffective erythropoiesis.

Reference