

Gelatinous bone marrow with vivid fatty cells

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Abstract

We treated a 78-year-old Japanese man with gastric diffuse large B cell lymphoma. The patient received three courses of chemotherapy and involved-field local radiation therapy to the stomach. Three years after chemotherapy, the patient became sick with anorexia and pancytopenia. He was cachexic, however, levels of vitamin B12, folate, zinc, and copper were normal. His bone marrow revealed focal eosinophilic deposit characterized by mixture of vivid atrophic fatty cells, which was pathologically diagnosed as gelatinous bone marrow. The patient's gelatinous marrow was characterized by CD68-stained vivid atrophic fatty tissue. We found that this finding is a possible alternative marker for gelatinous marrow.

Keywords: gelatinous bone marrow, pancytopenia, anemia, thrombocytopenia

We treated a 78-year-old Japanese man after chemotherapy for gastric diffuse large B cell lymphoma, stage IE. Treatment comprised three courses of R-CHOP (375 mg/m² rituximab, 750 mg/m² cyclophosphamide, 50 mg/m² doxorubicin, and 1.3 mg/m² vincristine, all given on a single day, and 100 mg/body prednisolone for 5 days) and involved-field local radiation therapy to the stomach. A complete response was achieved. Three years after the completion of chemotherapy, the patient was admitted to our hospital because of anorexia. Although his malignant lymphoma was in remission, his body weight had decreased from 46.5 to 33.9 kg for 3 years after chemotherapy. Laboratory data revealed pancytopenia (white blood cells, 2.5 × 10³/μl; hemoglobin, 8.2 g/dl; platelets, 68 × 10³/μl; and mean corpuscular volume, 100.8 fl). Hematopoietic nutritional deficiency screening revealed normal levels of vitamin B12 (1450 pg/ml), folate (3.8 ng/ml), zinc (101 μg/dl), and copper (53 mg/dl). However, the vitamin B1 level was low (14 ng/ml). The fatty acid fraction was almost within the normal range. Infectious disease screening was negative, including hepatitis B and C viruses, tuberculosis, and HIV. Laboratory testing showed the following: C-reactive protein, 1.82 mg/dl; albumin, 2.7 mg/dl; total protein, 6.1 g/dl; calcium, 7.8 mg/dl; creatinine, 0.65 mg/dl; blood urea nitrogen, 25 mg/dl; and bilirubin, 0.5 mg/dl. The T3 level was low. The anti-nuclear antibody level was less than ×40, and serum complements (C3, C4, and C5) were within the normal range.

We administered vitamin B12 in a nutritional drink containing 750 μg/day cyanocobalamin. However, the cytopenia did not resolve. Computed tomography showed no hepatosplenomegaly (liver depth, 65 mm; spleen size, 62 × 35 mm). Bone marrow examination showed hypercellularity with gelatinous changes (Fig. 1a) and no evidence of malignancy [1]. The gelatinous marrow was characterized by CD68-stained vivid atrophic fatty tissue

(Fig. 1b and c). We consider that this finding may serve as an alternative marker for gelatinous marrow because CD68 is activation marker on adipose tissue-infiltrating macrophages, which might contribute to remodeling of atrophic adipose tissue. Fatty cell atrophy is part of the spectrum of adipose tissue atrophy caused by lack of lipid intake, as seen in conditions such as cachexia [2]. Although the pathogenesis of gelatinous marrow transformation remains unclear, its etiology and risk factors are associated with anorexia and cachexia [3]. Diagnosing gelatinous marrow transformation via bone marrow aspiration can be challenging because the lesions contributing to cytopenia are focal. Gelatinous marrow transformation is reversible, and a sensitive diagnosis is required to restore hematopoiesis. Our patient's cytopenia improved with nutritional support, including nourishing foods such as whole milk and soybeans.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to disclose. The authors declare that they have no competing interests.

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ETHICAL APPROVAL STATEMENT

We obtained approval from the Kagawa University Hospital Institutional Review Board. The case report was approved by the institute's committee on human research.

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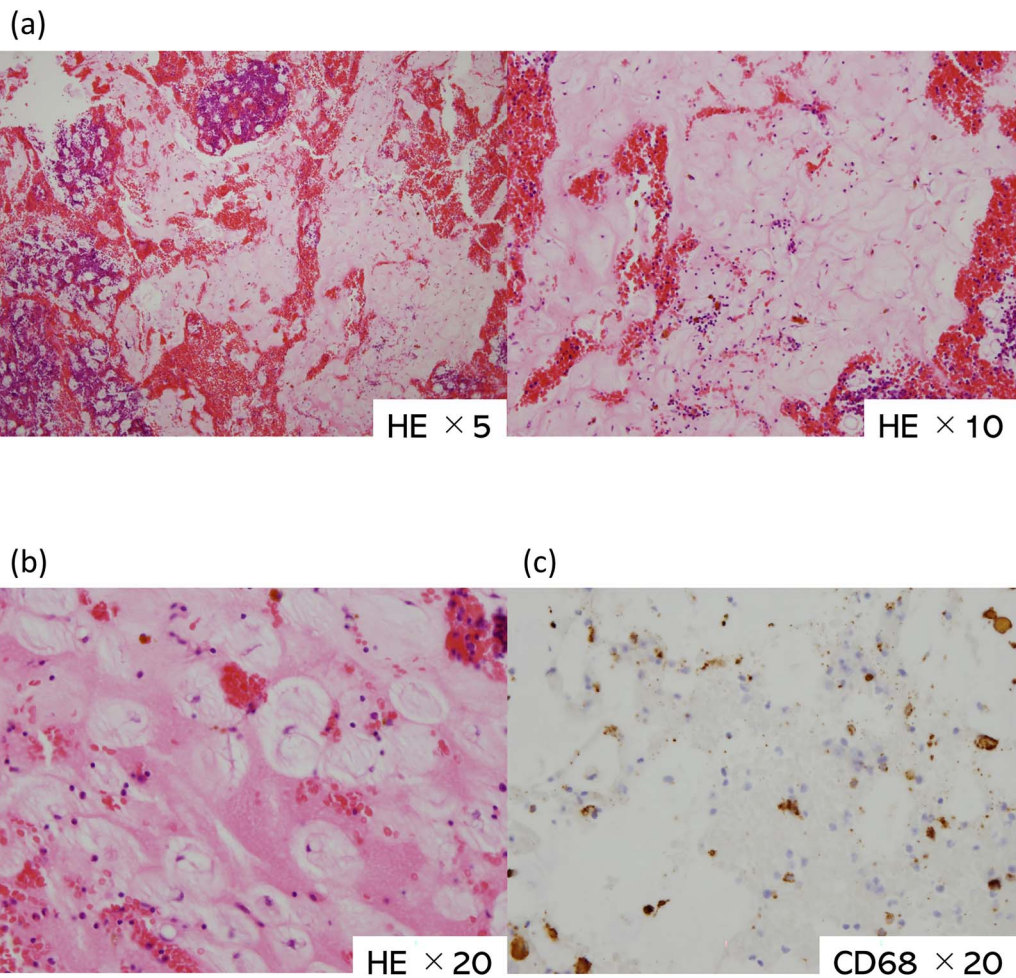


Figure 1. Pathology of bone marrow trephine biopsy. (a) Bone marrow findings showed hypercellular marrow, but focal hypoplasia was replaced with eosinophilic deposition with atrophic fatty cells. Gelatinous changes were observed without evidence of malignancy. (b) Atrophic fatty cells were scattered vividly in an unstructured gelatinous area. (c) The fatty cells were stained with CD68.

PATIENT CONSENT STATEMENT

The patient have given their written informed consent to publish their case (including publication of images).

DATA AVAILABILITY

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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