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Clinical Image

CLINICAL IMAGE

Bone marrow metastasis of glioblastoma multiforme mimicking acute myeloid leukemia

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Abstract

A 46-year-old female patient with glioblastoma multiforme (GBM), IDH wild type developed severe pancytopenia 5 months after postoperative chemoradiotherapy. Bone marrow aspirate showed normocellular marrow with 70.0% abnormal cells, which suggested the possibility of acute myeloid leukemia. Immunophenotypic analysis did not show any hematological lineage markers, except for cluster of differentiation 56. The results of immunohistochemical staining of glial fibrillary acidic protein and oligodendrocyte transcription Factor 2 were positive. Based on these findings, the patient was diagnosed with bone marrow metastasis from GBM. Bone marrow metastasis from GBM is rare and little is known about the morphological characteristics of bone marrow aspiration smear findings. We experienced a rare case with marrow metastasis from GBM mimicking acute myeloid leukemia.

A 46-year-old female patient with glioblastoma multiforme (GBM), IDH wild type was admitted to our hospital for postoperative chemoradiotherapy 3 weeks after craniotomy. Laboratory tests at admission did not show any significant abnormalities and the patient received concurrent radiotherapy with temozolomide as scheduled. However, severe pancytopenia was found to have rapidly progressed 5 months later (white blood count cell count of 1.9×10^9/L [neutrophils 66.5%, lymphocyte 16.5%, monocytes 8.5%, eosinophils 2.5%, basophils 0.5% and abnormal cells 0.5%], hemoglobin concentration of 10.7 g/dl and platelet count of 60×10^9/L). Moreover, serum lactate dehydrogenase level had increased to 3271 U/L. Computed tomography revealed no abnormal findings suggesting thoracic and abdominal organ metastasis.

Bone marrow aspirate showed normocellular marrow with 70.0% abnormal cells (Fig. 1a). The abnormal cells were similar to bone marrow blasts in terms of cell size and nuclear morphology, which suggested the possibility of acute myeloid leukemia. However, the basophilic cytoplasm and cell cluster formation was distinctive. Immunophenotypic analysis did not show any

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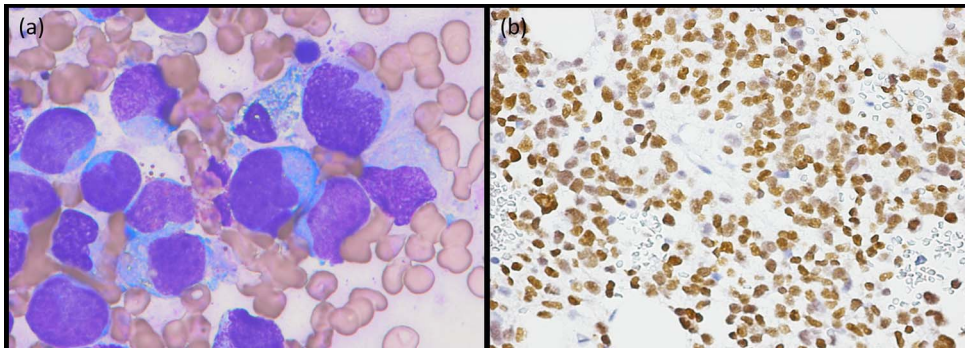

Figure 1: Bone marrow aspiration smear (**a**) and biopsy with immunohistochemical staining of oligodendrocyte transcription Factor 2 (**b**).

hematological lineage markers, except for cluster of differentiation 56. However, the results of immunohistochemical staining of glial fibrillary acidic protein and oligodendrocyte transcription Factor 2 (Fig. 1b) were positive. Based on these findings, the patient was diagnosed with bone marrow metastasis from GBM. She received the best supportive care and died 1 month after diagnosis.

The incidence rate of extracranial metastasis of GBM has been reported to be 0.4–0.5% [1]. Although radiotherapy and surgery may facilitate tumor dissemination and lead to extracranial metastasis, exact mechanism remains unclear [2]. Only 16 cases of bone marrow metastasis from GBM have been reported in the literature and little is known about the morphological characteristics of bone marrow aspiration smear findings [3]. Although bone marrow metastasis of GBM is extremely rare, physicians should consider the possibility when progressive cytopenia exists.

CONFLICT OF INTEREST

None.

FUNDING

There were no sources of funding.

ETHICAL APPROVAL

The protocol for this study was approved by the Institutional Ethics Review Board of our hospital.

CONSENT

Written informed consent for publication was obtained from the patient's family.

GUARANTOR

Yusuke Kanemasa.

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