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Case Report

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Is Bone Marrow Metastasis in Gastric Cancer Adequate for Best Supportive Care Decisions? Or is There Still a Chance?

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ABSTRACT

Gastric carcinoma is one of the most common types of cancer worldwide. Although intra-abdominal metastasis is common, bone marrow metastasis (BMM) is quite rare, and patients with this condition may present with cytopenia. We present the case of a patient with gastric carcinoma and BMM who experienced bone marrow suppression and bicytopenia (anemia and thrombocytopenia) regressing after two cycles of chemotherapy. A 58-year-old male patient with advanced-stage gastric adenocarcinoma presented with bicytopenia. BMM was confirmed by bone marrow aspiration biopsy. Bone marrow suppression regressed after initiation of chemotherapy. BMMs are rare in gastric carcinoma, and there is no standard treatment for these malignancies. Our case report is remarkable as it demonstrates a rare case of bone marrow suppression following chemotherapy in a patient and suggests the potential efficacy of 5-FU and platinum-based chemotherapy.

Keywords: Gastric cancer, bone marrow, metastasis, chemotherapy

Introduction

Gastric carcinoma is the 5th most common type of cancer worldwide and is generally more prevalent in Asian countries than in others [1]. Patients are typically symptomatic upon diagnosis, with the most common symptoms being dysphagia, weight loss, and persistent abdominal pain. Most patients are diagnosed at an advanced stage, which often precludes curative treatment. In advanced-stage disease, the liver, peritoneum, and intra-abdominal lymph nodes are the most common sites of distant metastasis. Ovarian and central nervous system metastases are less frequent, whereas bone and bone marrow metastases (BMMs) occur in less than 10% of patients [2]. Concurrent occurrence of BMM and disseminated intravascular coagulation (DIC) in gastric carcinoma is extremely rare, and treatment response is generally limited [3]. In this case report, we describe an advanced-stage gastric carcinoma patient who developed bicytopenia and DIC secondary to BMM. The patient's bone marrow suppression, bicytopenia, and DIC improved significantly after two cycles of chemotherapy.

Case Report

A 58-year-old male patient with diabetes mellitus and coronary artery disease presented with a weight loss of 20 kg in 6 months. Esophagogastroduodenoscopy revealed multiple ulcerated lesions at the lesser curvature of the stomach, and a biopsy confirmed gastric adenocarcinoma with a signet ring cell component (c-erbB2 negative). Thoracoabdominal computed tomography (CT) imaging showed multiple intra-abdominal and mediastinal lymph nodes. Positron emission tomography (PET)/CT examination detected widespread metastatic foci in the bones, multiple metastatic lymph nodes in the mediastinum, and a malignant mass at the lesser curvature along with multiple intra-abdominal metastatic lymph nodes. Blood tests revealed bicytopenia with normal anemia markers and no atypia on peripheral blood smear examination. Bone marrow aspiration biopsy confirmed gastric adenocarcinoma metastasis. Due to increased D-dimer and decreased fibrinogen levels, the patient was evaluated at the hematology clinic. Oxygen therapy was not

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required, and pulmonary thromboembolism was ruled out on imaging. Platelet, fresh frozen plasma, and erythrocyte suspensions were administered based on a preliminary diagnosis of DIC. The patient's condition was attributed to BMM of gastric adenocarcinoma, and chemotherapy was initiated with a 50% reduction in the mFOLFOX6 dose. The following chemotherapy, the patient's bicytopenia and DIC improved, with blood test results showing recovery and resolution of bone marrow suppression. The patient's general condition improved after chemotherapy, and he is currently monitored during the third month of treatment. Blood values before chemotherapy, on the 15th day after each chemotherapy cycle, and two months after starting chemotherapy are summarized in Table 1.

Discussion

Although BMM is common in solid organ tumors, it is rarely detected in metastatic gastric carcinoma. It is mostly observed in poorly differentiated subtypes in relatively young patients, and there is no standard treatment method [4]. Similar to this information, our patient was a young 58-year-old, and in the pathological examination, it was reported that the tumor had a signet ring cell component. Signet ring cell subtype shows poor differentiation. In a series examining the frequency of BMM in patients with gastric carcinoma, the incidence of BMM was found to be 1% [5]. In a study examining 2150 patients with metastatic gastric carcinoma, the frequency of BMM was reported to be only 0.9% [6]. The most useful imaging modality for detecting BMMs is PET/CT, and in our patient, widespread increased metabolic activity was detected in bone using PET/CT [7]. Although cytopenia alone may be seen in patients with BMMs, patients may present with cytopenia and DIC, as in our case [3]. The causes of anemia and bicytopenia in patients with gastric carcinoma who have undergone surgery or whose gastric mucosal integrity is impaired may be iron and vitamin B12 deficiency. In our patient, anemia markers were observed and were within the normal range. Gastric carcinoma presenting with DIC generally has a poor prognosis and is known to be resistant to chemotherapy; however, it has been reported in some case series that they benefit from 5-FU-based chemotherapy [8-10]. In a study, it was reported that the response rate to 5-FU, platinum, and taxane-based chemotherapy in patients with gastric cancer and BMMs was approximately 30%, and the average survival was approximately 1 year [11]. Our patient was treated with the mFOLFOX6 protocol, which contains 5-FU and a platinum-based chemotherapy agent, and it was observed that the suppression of bone marrow regressed with treatment from the first cycle. In parallel with the response we received with chemotherapy, a study reported that the prognosis was better in gastric carcinoma patients with BMMs in those who received palliative chemotherapy than in those who did not receive chemotherapy, and overall survival was found to be longer in the group receiving chemotherapy [12]. In another study, the average survival in patients with bone marrow metastatic gastric carcinoma receiving chemotherapy was reported to be 3 months, whereas it was reported to be two months in patients monitored with best supportive care [8]. This information in the literature supports the limited response to treatment in bone marrow metastatic gastric carcinoma, and although benefit is extremely rare in these patients, more courageous use of chemotherapy may be required.

Conclusion

BMMs are rare in gastric carcinoma, and no standard treatment method has been established for these patients. Treatments that have shown limited benefits may be withheld due to cytopenia resulting from bone marrow involvement. Our case report is noteworthy because it represents a rare case of bone marrow suppression and DIC responding positively to chemotherapy in a patient with bone marrow metastatic gastric carcinoma. This highlights the potential for the more robust use of 5-FU and platinum-based chemotherapy regimens in such cases.

Table 1. The patient's blood values before chemotherapy, on the 15th day after the first and second cycles of chemotherapy, and two months after initiation of chemotherapy

Test	Before chemotherapy	15th day after the first cycle of chemotherapy	15th day after the second cycle of chemotherapy	Two months after initiating chemotherapy
Hemoglobin (gr/dL)	6.1	7.9	8.5	8.4
Total bilirubin level (mg/dL)	2.43	1.9	1.09	0.99
Direct bilirubin administration (mg/dL)	0.7	0.6	0.37	0.25
Platelet (x10^3 cell)	26	79	106	140
INR	2	1.6	1.54	1.35
LDH (U/L)	934	693	383	266
D-dimer (µg/L)	35,200	22,650	10,800	
Fibrinogen (mg/dL)	99.4	99.7	116	116

LDH: Lactate dehydrogenase, INR: International normalization ratio

Ethics

Informed Consent: It was not necessary.

Footnotes

Authorship Contributions

Surgical and Medical Practices: B.K., Concept: F.Y., Design: N.A., Data Collection or Processing: B.K., Analysis or Interpretation: F.Y., Literature Search: E.A., Writing: B.K.

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