Leptomeningeal metastasis from ovarian carcinoma successfully treated by the intraventricular administration of methotrexate

Abstract  A 60-year-old woman with a history of ovarian carcinoma and complaining of gait instability, dizziness, nausea, and a right temporal headache visited a neurologist. A diagnosis of leptomeningeal metastasis was made, based on the results of a cerebrospinal fluid examination. After the administration of intrathecal methotrexate, her neurological complaints disappeared. An Ommaya intraventricular reservoir was inserted, and methotrexate administration was continued for 11 months, until another recurrence was found in her pelvis. Although uncommon, the possibility of leptomeningeal metastasis from ovarian carcinoma should be considered; in such cases, treatment with intraventricular methotrexate may be effective and feasible and should be considered as a treatment strategy.

Key words  Leptomeningeal metastasis · Ovarian carcinoma · Intrathecal chemotherapy · Methotrexate

Introduction

Metastasis to the central nervous system (CNS) from ovarian carcinoma is uncommon, and leptomeningeal metastasis is even more uncommon. The reported incidence of CNS metastasis from ovarian carcinoma ranges between 0.29% and 4.5%, and the number of reported cases of leptomeningeal metastasis is less than 30.

In this report, we describe the case of a 60-year-old woman with a leptomeningeal metastasis from an ovarian carcinoma; this patient was successfully treated by the intraventricular administration of methotrexate.
chemotherapy), a wide-based gait, and difficulty standing with her feet placed together — regardless of whether her eyes were open or closed. She was afebrile with no visible signs of malaise, and she did not have a stiff neck.

Further diagnosis workup was done by the neurologist. Magnetic resonance imaging (MRI) of the brain revealed no evidence of metastasis. MRI of the spine revealed an enhancement along the nerve roots of the cauda equina (Fig. 2). An examination of her cerebrospinal fluid was done on the same day, and revealed malignant cells (15 cells per μl) with the same characteristics as the serous adenocarcinoma cells in the peritoneal lavage derived from the ovarian cancer (Fig. 1B). Thus, a diagnosis of leptomeningeal metastasis was confirmed. She was then referred to our hospital for further management.

The patient’s clinical screening results, complete blood count, urinalysis results, chest X-ray, and bone scan were normal. A computed tomography (CT) examination of her abdomen disclosed no evidence of recurrent malignancy. Her serum CA125 level was elevated (90 U/ml).

The patient was given intrathecal methotrexate at the dose of 10 mg/kg of body weight per day for one day. She developed nausea as an adverse event, but her symptoms were alleviated after the intrathecal administration of 20 mg prednisolone. The intrathecal methotrexate treatment was repeated three times, at intervals of 5 days. Her neurological complaints disappeared, and so an Ommaya intraventricular reservoir was inserted, without any complications. The dosing interval was gradually extended, but when it was tapered off to a dosing interval of once in 2 months, lumbago and weakness of the lower limbs appeared. Therefore, we reverted to once-monthly administration and continued this treatment for a total of 19 times (190 mg/kg of body weight). The cerebrospinal fluid cytology results remained positive, but the number of cells decreased during the treatment. Her serum CA125 level returned to within the normal limit after the third administration, but gradually increased once again after June 2005, when the sixteenth administration was performed.

In October 2005, a CT examination showed a new tumor in her left pelvic region, and her serum CA125 level was elevated to 119 U/ml. Based on this evidence, we diagnosed a recurrence of the disease and started systemic treatment with six cycles of docetaxel and carboplatin, producing a good clinical response. However, in May 2006, a meningeal metastasis became apparent on a head MRI examination. One week later, she developed rapidly progressive consciousness disturbance and died.

**Discussion**

Herein, we have reported a rare case of leptomeningeal metastasis from an ovarian carcinoma that was successfully treated by the intrathecal administration of methotrexate. Although metastases to the CNS from ovarian carcinomas are uncommon, the incidence of such metastases might increase with the prolongation of survival associated with improved primary treatment. This phenomenon has also been reported in some other types of tumors, such as breast cancer.