Intra-tumor Hemorrhage Associated with Brainstem Metastasis from Lung Cancer

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Among the hemorrhages in the brainstem, hypertensive pontine hemorrhage is the most common, and its mortality rate is reported to be 40-47.5% (1, 2). Most patients with dorsally located small pontine hemorrhages are able to survive. However, patients with centrally located large hemorrhage sometimes show consciousness disturbance, tetraparesis and an irregular breathing pattern requiring intubation and mechanical ventilation (1, 2). Here, we report a patient with intra-tumor hemorrhage in the midbrain adjacent to the cerebral aqueduct associated with metastasis from lung adenocarcinoma.

A 62-year-old man, with a 10-year history of hypertension, was admitted to our hospital for further evaluation of a 3-month history of cough and headache. Physical examination at admission was unremarkable. Chest X-ray and CT scan showed a 6×3 cm nodular lesion in the right lung. Serum level of carcinoembryonic antigen was elevated (27.4 ng/ml). Histopathological examination of the specimen, which was transbronchially obtained from the lesion, was lung adenocarcinoma. Choriocarcinomatous change was not observed in the specimen. Abdominal CT showed no renal lesion. However, brain MRI revealed numerous enhanced nodules up to 18 mm in diameter, consistent with metastatic disease, scattered throughout the brain. One lesion in the right midbrain was adjacent to the cerebral aqueduct. He received whole-brain irradiation with a total dose of 30 Gy. MRI of the brain after completion of the radiotherapy showed no decrease in the size of the preexisting metastatic lesions. His course was uneventful for 3 months, but he suddenly developed left hemiparesis with right oculomotor nerve palsy. Head CT scan revealed intra-tumor hemorrhage in the metastatic lesion of midbrain. He was treated conservatively, but his symptoms gradually improved such that he was able to move between his bed and wheelchair with minimal assistance one month after the episode. Follow-up MRI study revealed disappearance of the hemorrhage and the surrounding edema. He died of lung adenocarcinoma 3 months later.

Kondziolka et al reported that 14.6% cases of intracranial hemorrhage were found within the total series of 905 brain tumors (3). They also showed that metastatic malignant melanoma bled in half of their cases, with 5 of 14 tumors being associated with gross bleeds (3). Among, metastatic brain tumors, malignant melanomas as well as choriocarcinomas and renal cell carcinomas frequently develop significant hemorrhage (3, 4). Wakai et al reported that the incidence of hemorrhage from metastatic brain tumor was 2.9% (4). With regard to the etiology, hypertension and coagulopathy are thought to be risk factors of intratumoral hemorrhage in some cases. But the causes of intratumoral hemorrhage are often considered to be endothelial proliferation with vascular obliteration, vessel compression, and distortion due to rapid tumor growth, vessel necrosis, invasion of vessel walls by the tumor, and increased venous pressure associated with increased intracranial pressure (3, 5). We do not know why the brainstem hemorrhage occurred in this case. Bleeding tendency and severe liver dysfunction were not observed, and no chemotherapeutic drugs were prescribed at the time of development of the hemorrhage. There was no proof of hemorrhage due to the direct influence of whole-brain irradiation, however, we assumed that chronic hypertension and irradiation might play a role in predisposing the lesion to bleed. In addition, we do not know why the hemorrhage was restricted to the brainstem lesion though he was treated conservatively.

In the present case, MRI demonstrated a metastatic midbrain tumor before the development of the hemorrhage, which suggested that the hemorrhage originated from the metastatic lesion. CT findings are usually diagnostic for intracranial hemorrhage, however, brain MRI would be informative to establish a diagnosis of intra-tumor hemorrhage in patients with brainstem metastasis. Although extremely rare, intra-tumor hemorrhage should be included in the differential diagnosis of brain hemorrhage if patients have a history of malignant disease.

References

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