Case Report

A Case Report of Long-term Survival after Radiotherapy for a Solitary Brain Metastasis from Breast Cancer

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This is the report of a patient with a solitary brain metastasis from breast cancer who survived more than 8 years after the first brain metastasis. The brain metastasis was treated with partial removal followed by 30 Gy/15 fractions of whole brain irradiation plus 20 Gy/10 fractions of local boost irradiation for 5 weeks. Brain metastases from breast cancer are usually a sign of rapid systemic tumor progression and long-term survivors are extremely rare. However, this case demonstrated the possibility of long-term survival in rare cases of brain metastases from breast cancer. This suggests a need for aggressive therapy in patients with a solitary brain metastasis.


Key words: Breast cancer, Brain metastasis, Radiotherapy

Brain metastases develop in 10-15% of breast cancer patients1,2. The incidence rate may increase as the patients' lives are prolonged by the use of chemotherapy because almost none of the chemotherapeutic agents cross the blood-brain barrier in the normal brain tissue, thus making the brain a sanctuary for tumor cells3-5. Usually brain metastases indicate rapid systemic tumor progression and patients with brain metastases who live long are extremely rare6. We present a case of a patient who survived more than 8 years after radiotherapy for a solitary brain metastasis caused by breast cancer.

Case Report

The patient was a 40-year-old woman with a tumor in her right breast. Standard radical mastectomy was performed on September 21st, 1983. The pathological stage was T2N0M0, Stage II. The histopathological findings were consistent with a papillotubular adenocarcinoma (Fig 1). Tests for estrogen and progesterone receptors were positive. Post-operative chemoendocrine therapy had continued for almost two years and the therapy consisted of Mitomycin-C for 2 days and Tamoxifen citrate and Tegafur daily. In June 1986, the patient presented with headaches and vertigo. CT examination showed a marked contrast-enhanced mass in the right cerebellar hemisphere and 4th ventricle deviation (Fig 2, a). Partial removal of the brain tumor was performed on August 28th, 1986. The CT findings after surgery showed a large residual tumor (Fig 2, b). The histopathological findings of the brain tumor indicated papillotubular adenocarcinoma the same as the primary breast tumor (Fig 3). Radiotherapy which consisted of 30 Gy/15 fractions of whole brain irradiation plus 20 Gy/10 fractions of local boost irradiation was performed on the residual tumor for 5 weeks. After the completion of radiotherapy, she had no neurological deficits and worked as an accountant for more than 5 years. She was followed at monthly intervals. She had no symptom of illness and was medicated with prophylactic anti-convulsant and no anti-cancer drugs. Brain CT 5 years after the completion of irradiation showed a well-circumscribed cystic
lesion with no evidence of recurrence (Fig 4). After presenting with back pain in September, 1991, bone scintigram showed multiple bone metastases. Chemoendocrine therapy which consisted of Epirubicin hydrochloride, Cyclophosphamide, Fluorouracil (5-Fu) and Medroxy-progesterone acetate (MPA) was performed in 10 courses. Bone scintigram showed partial response to therapy in August, 1992. She was medicated with 5-Fu and MPA thereafter. However, she reported back pain caused by progressive bone metastases in September, 1993. Systemic chemotherapy which consisted of Pirarubicin hydrochloride was performed in 10 courses. When she had vertigo again in January, 1995, brain MRI showed multiple contrast-enhanced lesions in the cerebellum (Fig 5). Irradiation of the cerebellar metastases was started. Paraplegia of the lower extremities from thoracic spinal metastases developed. Despite irradiation of the cerebellum and of the thoracic spine, subsequent bone marrow involvement occurred and marked pancytopenia developed. She died due to a subarachnoid hemorrhage caused by thrombocytopenia on April 3rd, 1995. The total course of the disease was from 11 years and 6 months after surgery of the primary breast cancer, and from 8 years and 7 months after irradiation of the first solitary brain metastasis.

Discussion

Radiotherapy is an established, effective treatment for brain metastases and can be prevent progressive neurological deficits, restore function and control other symptoms such as headaches and confusion\(^7\). Despite initial improvement, many patients soon relapse and the