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SHORT REPORT

Letrozole for brain and scalp metastases from breast cancer—a case report

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Summary Brain metastases from breast cancer have a poor prognosis. There have been reports of patients with breast cancer and brain metastases responding well to tamoxifen therapy. We report a very unusual case of intact breast carcinoma with brain as well as scalp metastasis responding well to letrozole (aromatase inhibitor) therapy for a prolonged period of time.

Introduction

Brain metastasis is one of the most critical metastatic lesions in the treatment of breast cancer. Usually, patients with brain metastasis from breast cancer survive less than 2 months if left untreated. Neurological symptoms from brain metastases may be palliated by whole brain irradiation or by adrenocorticoid therapy, but after such treatment, median survival has been only slightly extended by 2–8 months. There have been reports of patients with breast cancer and brain metastasis responding well to tamoxifen therapy.[1–4] But in all these reports patients must have received adequate treatment for the primary tumor in the form of surgery, chemotherapy and/or radiotherapy. We report a very unusual case of intact breast carcinoma with brain as well as scalp metastases responding well to letrozole (aromatase inhibitor) therapy for a prolonged period of time.

Case report

A 48-year-old woman with metastatic breast carcinoma was referred to our department in March 2005 with secondary of the dorsolumbar spine for palliative radiotherapy. She was given 30 Gy radiation over the spine in ten fractions by Theratron 780 E over a period of 2 weeks. Her past history of the disease and examination revealed some interesting facts. She had a right breast lump, detected in September 2000 at the age of 43 years. Due to the progressive nature of the lump, she consulted a surgeon and a biopsy was performed. Histology

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revealed an infiltrating ductal carcinoma of the breast, T4N1bM0 (Stage IIIB). Receptor analysis was not done. She was advised to undergo anthracycline-based chemotherapy followed by surgery. She received three courses of anthracycline-based chemotherapy with a good response at the local site. Due to personal reasons she did not undergo surgery and continued on oral tamoxifen therapy of 20 mg, once daily. Later, in August 2003, she developed episodes of unconsciousness with a right scalp swelling. Her contrast-enhanced computed tomography (CECT) revealed a large heterogeneous lesion showing post-contrast enhancement in the right parietal lobe along with a destructive expansile parietal bone lesion with a soft tissue component of the right scalp suggestive of brain and scalp metastasis (Fig. 1). She was hospitalized and managed conservatively with mannitol and corticosteroids. Subsequently, she was switched over to 5-mg letrozole tablets, once daily. She did not undergo irradiation, surgery and/or chemotherapy following this treatment, but continued on oral letrozole therapy. In March 2005, repeat CECT of the brain surprisingly revealed complete resolution of scalp swelling and a gross reduction in the brain metastasis (Fig. 2). At present she has a retracted right breast (Fig. 3) with no neurological deficit and a *KPS* of 100. The only medication she is currently taking is 5-mg letrozole tablets daily. Due to bony secondary, parenteral bisphosphonate has also been started.

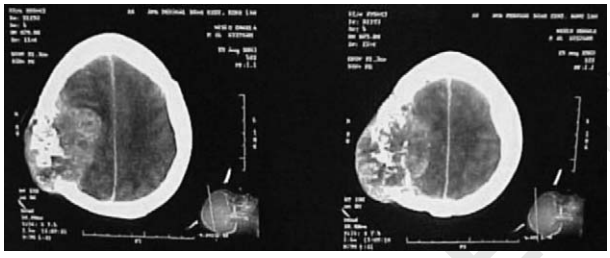

Figure 1 A contrast-enhanced computed tomography (CECT) film showing a large heterogeneous lesion with post-contrast enhancement in the right parietal lobe along with a destructive expansile parietal bone lesion with a soft tissue component of the right scalp suggestive of brain and scalp metastases.

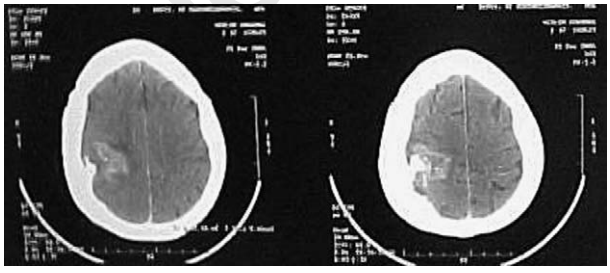

Figure 2 A repeat CECT film of the same patient showing complete resolution of the scalp lesion and gross reduction/calcified metastatic lesion of the brain.

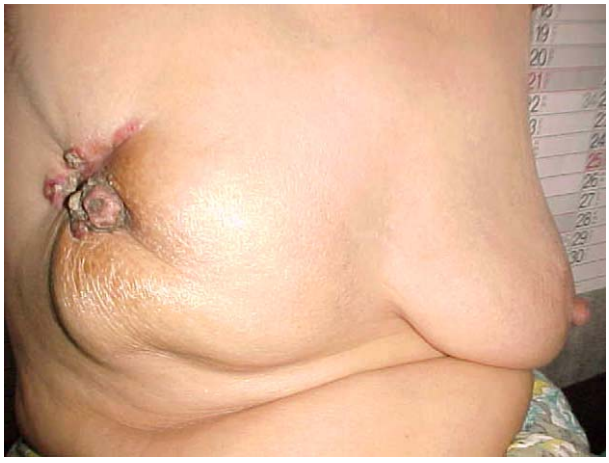

Figure 3 Film of the patient showing retracted intact diseased breast.

Discussion

Breast cancer is, after lung cancer, one of the most frequent sources of metastases to the central nervous system. Two to sixteen percent of breast cancer patients develop brain metastases despite all the treatment off the primary tumor such as surgery followed by radiotherapy and combination chemotherapy.[5] In general, brain metastases are treated with corticosteroids and/or radiotherapy and sometimes by surgery in cases of solitary metastases. But after such treatment, median survival has been only slightly extended by 2–8 months. The response of cerebral metastases from breast cancer to endocrine drugs including tamoxifen has been reported in a few patients.[1–4] Lien gave the first report on the distribution of tamoxifen and metabolites in brain tissue and brain metastases in breast cancer patients.[6] They found that the concentration of tamoxifen and its metabolites was up to 46-fold higher in brain tissue and brain metastases compared with the concentration in serum. He has explained that the high levels of the drug and its metabolites in the metastatic tumor may suggest the association of these agents with tumor constituents. The binding capacity of estrogen receptors, which have been demonstrated in metastases from breast cancer, is too low to account for the tamoxifen uptake in the

tumor tissue. The presence of other acceptors of antiestrogens has been reported. These include the so-called antiestrogen binding sites cytochrome P-450, protein kinase C, calmodulin, histamine-like receptors, muscarinic receptors, and dopamine receptors. Tamoxifen and its metabolites may bind to these acceptors, but may also partition into the myelin layer of the brain.[6] However, no such data are available for aromatase inhibitors so far. We did not come across any reports in which a patient with brain along with scalp metastasis survived for more than 2 years. This report is unique due to the fact that patient did not undergo any integrated treatment for the primary breast cancer or for the metastatic brain lesion other than letrozole (an aromatase inhibitor).

Conclusion

We are reporting this case to highlight some interesting observations such as the encouraging response of brain as well as scalp metastases just by means of oral letrozole therapy. This report highlights the potentials of endocrine therapy. No such case has been reported in the literature in which brain and scalp metastases were present simultaneously and a dramatic response was achieved with oral letrozole therapy.

Such cases as the present one point to only one fact: that even the most advanced and metastatic breast cancer patients should be kept on hormone therapy, although few may respond dramatically. The effect of hormone therapy should be studied further in patients with brain metastases from hormone-sensitive breast cancer or estrogen receptor-positive tumors. Receptor status, which is now widely available, should be evaluated in all patients.

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