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Breast Cancer and Meningioma : A Case Report

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Abstract **A 44 year-old female was diagnosed to have breast cancer 4 years prior to this admission. She was treated with modified radical mastectomy and a complete course of chemotherapy and radiotherapy.**

This admission, she presented with chronic progressive headache and dizziness for 2 months. Physical examination failed to find any significant neurological deficit. Computerized tomography of the brain showed an abnormal homogenous enhancement mass at the inner table of left frontal bone with compression on the cerebral cortex. Craniotomy revealed a 1×2×3 cm mass adjacent to the dural base with compressed cerebral cortex. Total gross tumor removal and dural excision were performed. Pathological study confirmed the tumor to be meningioma.

In 1975 Schoenberg reported the association of meningioma and breast cancer. Thus, a patient with established diagnosis of breast cancer who presents with central nervous system symptoms cannot simply be assumed to have cerebral metastases. A thorough workup to rule out the possibility of a meningioma is necessary.

Index words : **Breast cancer, meningioma, cerebral metastasis**

Breast cancer is a common neoplasm in women, accounting for 28% of cancers (or affecting 1 of every 13 women). Likewise, meningiomas are common benign tumor encountered twice as often in women as in men. In 1975, an association between breast cancer and meningioma was suggested by Schoenberg et al. Rubenstein et al summarized numerous articles suggesting that coexistence of these two neoplasm is more common than expected. Salvati et al suggest that an association of these tumors is possible. Some authors have noted hormonal sensitivity and the presence of hormonal receptors in some meningioma. This report a case of meningioma subsequently developed in a patient with breast carcinoma, which was originally through to be single brain metastases. The aim of this study was to describe the nature and management of these patients in review of literature. The knowledge of this association is important in the differential diagnosis of patients with breast cancer who developed central nervous system manifestations. It is necessary to pay attention to neurological symptoms and signs during follow-up of breast cancer patients.

Case Report

A 44-year-old Thai woman patient was described with a hard mass in the left breast in 4 years ago. Pathologic biopsy showed that invasive intraductal carcinoma. A modified radical mastectomy was done and received the complete course of adjuvant therapy (chemotherapy and radiation). She did well in a long time and follow-up for 4 years. About four years after

mastectomy, she had symptoms of progressive chronic headache and occasionally mild to moderate degree type of dizziness for 2 months before this admission. Sometime symptoms relieved by medications.

Physical examination was found neurologically grossly intact without localizing sign. The computerized topography (CT) scan of the brain has showed that abnormal mass at left frontal pole region about 3 centimeter (cm.) in diameter adhered dura and homogeneous enhancement with contrast media, compression effect on cerebral cortex, no perilesional edema as seen (Figure 1). Chest x-rays show no abnormal mass as seen.

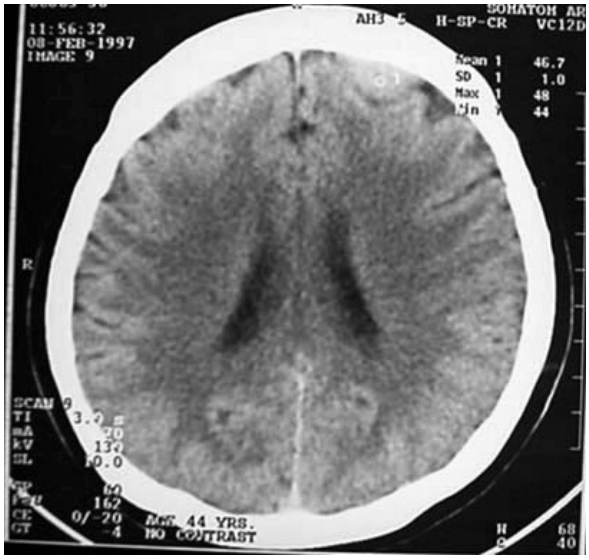

Fig. 1 Left frontal mass with dural base and enhancement about 2-3 cm. Compression on left cerebral cortex, no perilesional edema.

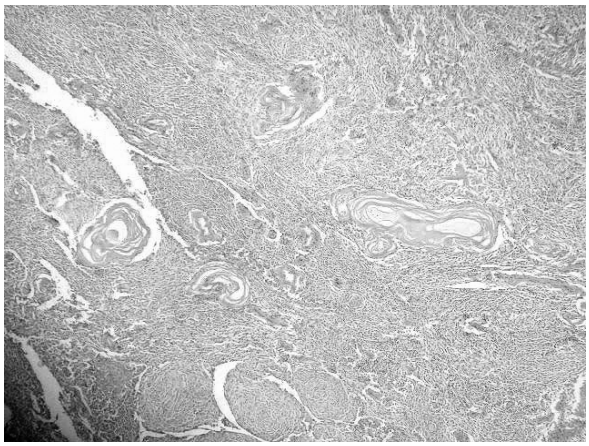

Fig. 2 Picture of H and E stain showing characteristic psamoma bodies formation.

The left frontal craniotomy via bicoronal scalp flap was performed; gross total tumor removal with dural attachment tumor bed was excision and pericranial dural graft was done. The operative findings was left frontal convexity globular mass adhered dura about 1 cm from midline, pink-gray in color and firm to hard in consistency with gritty sensation on cut surface, about 3x2x3 cm. in size, and compressed on cerebral cortex. Pathological section reported to meningioma confirmed the diagnosis (Figure 2). The removal of the meningioma resulted in return of normal neurological function.

Discussion

Breast cancer is the most common malignancy in woman, affecting 1 in every 13 women. Similarly, meningioma occurs in a fairy large percentage of the population, or about 20% of all CNS tumors, with 2:1 predilection for women and usually manifests symptoms in the fifth and sixth decades. Schoenberg et al suggest that the two neoplasm occur together in a higher than expected frequency. The reported association of meningioma with breast carcinoma may be a fortuitous one. Certain characteristics of meningioma, however, raise the intriguing question of hormonal dependence of these benign tumors and hence a possible relationship with breast carcinoma. Estrogen-receptor proteins present in carcinoma of the breast, about 60% of breast cancer estrogen-receptor positive. Donnell et al report the presence of fraction of estrogen-receptor protein in their patient. Posner, founded meningioma in end stage breast cancer, and incidence of 1.2%, which is significantly higher than in the general population. Furthermore, the abrupt appearance and enlargement of meningioma during pregnancy is well described.

Meningiomas on CT scans (Figure 3) appear as homogeneous high-density areas with well-defined borders. These tumors occur in typical locations and are enhanced by intravenous contrast material and perilesional edema is usually not very prominent look like in this patient.

Metastasis breast carcinoma is more likely to show as a strictly intraparenchymal lesion with less distinct borders and often massive perilesional edema. En plaque dural metastasis is an uncommon manifestation of breast cancer. The direct involvement of the

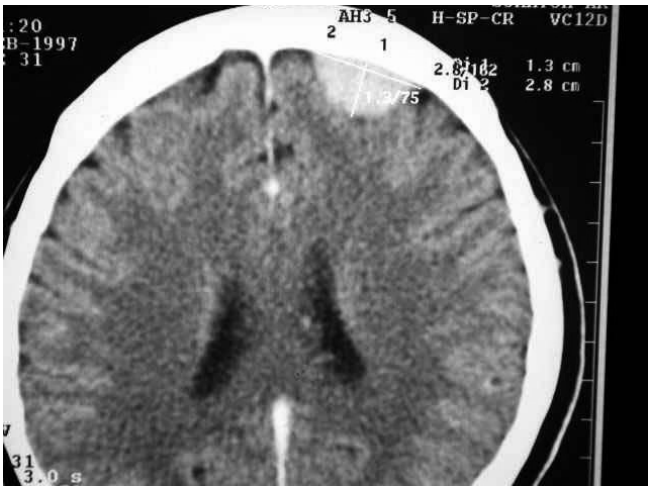

Fig. 3 Meningioma at left frontal, dural based and homogeneous enhancement lesion.

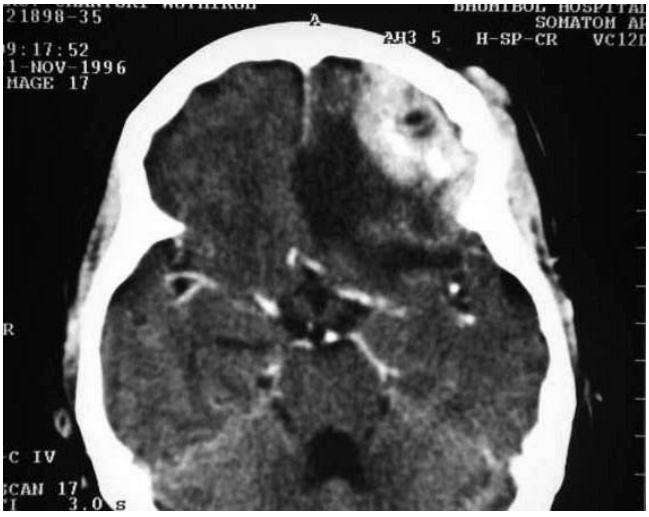

Fig. 4 Dural metastasis in CA breast patient, at left frontal with peri-tumoral brain edema, homogeneous enhancement.

leptomeningeal space with tumor is a less common manifestation of metastasis breast cancer (Figure 4), but it is one that requires specific diagnostic and therapeutic acumen.

Approximately 6% of all breast cancer patients will have meningeal involvement, and of those patients, only 50% will ever be symptomatic. The diagnosis can often be difficult, and patients can present with vague signs of miningeal irritation and with neuropathy caused by nerve root or parenchymal compression. Cranial nerves are involved in 78% of patients at presentation and in as many as 98% of patients throughout the course of the disease. In general about 80% of the CNS metastasis lesions included cerebrum, cerebellum, spinal cord and meninges. Multidisciplinary treatments including surgery, radiotherapy and systemic or intrathecal chemotherapy were given.

Cerebral angiography is the most specific test to help separate meningioma from metastases in the uncertain preoperative diagnosis. Meningeal arteries without early draining veins feed meningioma, and if a typical meningioma stains is produced. In contrast, metastatic lesions occur randomly throughout the brain, are usually fed by cortical arteries, and may show tumor vessels and early draining veins. The tumor stain in metastatic lesions is likely to be less distinct and shorter duration (Table 1). MRI can detect meningeal involvement directly with gadolinium enhancement in two thirds of cases. If studies confirm the suspicion of meningioma, craniotomy for curative excision may be indicated.

The treatment of cerebral meningioma requires craniotomy, while breast cancer metastases would probably be best treated with radiation therapy,

Table 1 Differential Diagnosis of Meningioma from Metastasis Lesions

	Meningioma	**Metastasis**
X-ray skull	Hyperostosis	Usually lytic lesion
Bone scan	Well-defined lesion increase uptake	Irregular lesion
CT scan	Well-defined mass with high density enhancement dural based	Irregular mass with high density and may be subependymal enhancement
Angiogram	Usually midline meningeal arteries prolonged staining	Random distributed cortical arteries early vein drainage
MRI	Isointensity in T1WI and inward displacement of cortical grey matter (cortical bulking), broad base against the dural surface	Non-enhancement in noncontrast MRI and enhancement in gadolinium contrast MRI may look like reactive meningeal enhancement

radiosurgery, steroids, chemotherapy, and possible hormonal suppression. The survival for patients with untreated meningeal metastases is approximately 6 weeks. With proper irradiation and intrathecal chemotherapy, 65% of patients will demonstrate response, boosting survival for those patients to 4 to 7 months. The clinician cannot assume that nervous system symptoms and signs in a patient previously treated for breast cancer represent cerebral metastases.

Therefore, a patient with established breast cancer who presents with central nervous system symptoms cannot be assumed to have cerebral metastases. A through workup to rule out meningioma is necessary (MRI, angiogram), the above-described investigation should aid in making a diagnosis. If uncertain diagnosis or clinical deterioration by herniation from mass affects the surgery is mainstay of treatment. It is necessary to pay attention to neurological symptoms and signs during follow-up of breast cancer patients.

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