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Case Report

Pituitary Metastasis of Breast Cancer: A Case Report

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SUMMARY

Metastasis to the pituitary gland is an unusual situation in clinical practice and is typically observed only in elderly patients, but its incidence is increasing because of the increased survival of patients with cancer. In most cases, such metastasis is found in patients aged 60–70 years, who usually present with various non-specific symptoms. The most common primary sites are breasts in women and lungs in men. The prognosis of patients with breast cancer metastasis is poor but it depends on the primary neoplastic extension. We report a case of a 63-year-old woman with a history of bilateral breast cancer with surgery 15 years ago on the left side and 8 years ago on the right side. A pituitary macroadenoma was first suspected because of a visual disturbance for months before a magnetic resonance imaging examination. The patient underwent resection of the pituitary tumor by endoscopic transnasal *trans*-sphenoidal surgery. The final histopathological and immunohistochemistry analysis confirmed a pituitary metastasis of breast mucinous carcinoma. Postoperative follow-up continued for 2.5 half years, and the subsequent clinical imaging studies did not show local recurrence of the primary malignancy. She is currently disease free and has a good performance status.

1. Introduction

Pituitary gland adenoma accounts for 5–20% of all central nervous system tumors in the adult population.[1] The percentage of pituitary tumors that are benign and primary carcinoma only account for 0.1–0.2% of all cases.[2] Metastasis to the pituitary gland is unusual. Among all pituitary tumor resections, only approximately 1% are found to be metastatic tumors.[3] Therefore, the pituitary gland is not a common site of metastasis. In previous autopsy series studies, pituitary metastases were found in 1–3.6% of patients with malignant tumors.[4] However, the incidence of pituitary metastases is increasing in recent years owing to the increased survival of patients with cancer.[5] Pituitary metastases occur most commonly in the elderly, especially those aged 60–70 years.[3] In this article, we report a rare case of pituitary metastasis from breast cancer, without clinical evidence of local recurrence of the primary malignancy.

2. Case report

A 63-year-old woman was admitted to The Mackey Memorial Hospital in October 2013, complaining of months of blurred vision and visual field disturbances. Her past personal history included invasive mucinous carcinoma of the left breast diagnosed 15 years ago, treated with left mastectomy, axillary dissection, and adjuvant chemotherapy. She had also been diagnosed with cancer in her right breast 8 years ago and received a similar treatment course.

The visual field examination confirmed bilateral temporal hemianopia. A subsequent cranial magnetic resonance imaging (MRI) scan displayed a lobulated tumor approximately 2.3 × 3.3 × 4.2 cm involving the pituitary fossa with suprasellar extension, compression of the optic chiasma, and inferior extension, destroying the sellar floor to the sphenoid sinus (Fig. 1A and B).

Initial laboratory tests showed a normal blood count, blood glucose level: 108 mg/dL, Na: 143 mmol/L (reference value [RV]: 136–145), K: 4.0 mmol/L (RV: 3.5–5.1), and creatinine: 0.7 mg/dL (RV: 0.4–1.2). Hormonal evaluation revealed hypogonadotropism (Table 1).

The patient underwent endoscopic transnasal *trans*-sphenoidal surgery with resection of the mass. Intraoperative frozen biopsy

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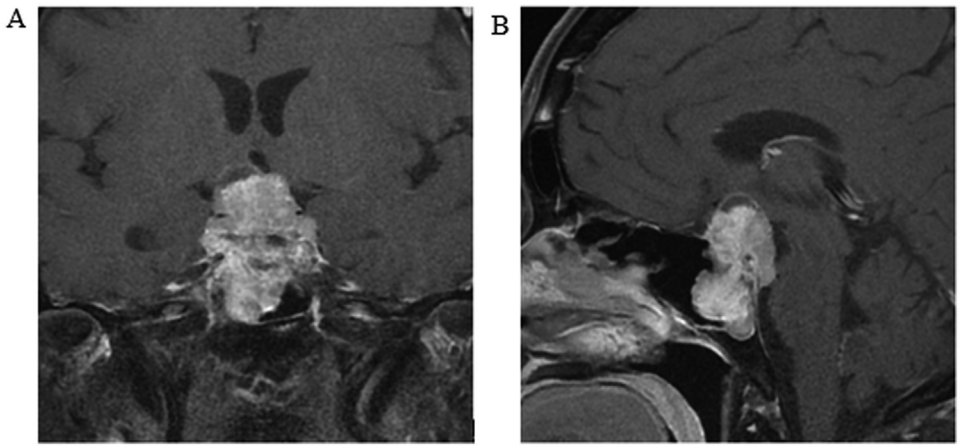

Fig. 1. Magnetic resonance imaging (MRI), T1-weighted with gadolinium enhancement, revealing the pituitary tumor. (A) Coronal section expansive formation in the sellar region, infrasellar and suprasellar with intense enhancement inside (B) Sagittal section: extension and destructing the sellar floor into the sphenoid sinus.

Table 1
Initial hormonal evaluation.

Hormone (unit)	Result	Reference
LH (mUI/mL)	5.48	10.8–61.4
FSH (mUI/mL)	25.47	35–151
PRL (ng/mL)	13.47	2–13
HGH (ng/mL)	0.09	<10.7
ACTH (pg/mL)	24.70	5.00–77.00
CORTISOL (μg/dL)	9.41	4.75–23.27
T4 (μg/dL)	9.75	4.50–12.00
T3 (ng/dL)	125.33	78.00–182.00
TSH (μUI/mL)	0.77	0.25–4.00

LH: luteinizing hormone, FSH: follicle-stimulating hormone, PRL: prolactin, HGH: human growth hormone, ACTH: adrenocorticotropic hormone, T3: triiodothyronine, T4: thyroxine, TSH: thyroid - stimulating hormone.

showed a pituitary gland adenoma. The histopathological analysis was consistent with metastatic mucinous carcinoma and the immunohistochemistry results were positive for cytokeratin-7, cytokeratin 20, estrogen receptor, progesterone receptor, and partially positive for 15 kD gross cystic disease fluid protein. The Ki-67 proliferation index was 16% (Fig. 2).

Routine postoperative care was unremarkable. Transient diabetes insipidus occurred and rapidly recovered after hormone replacement. The patient improved clinically and experienced a gradual restoration of her ophthalmological disturbances. Adjuvant chemotherapy with letrozole 2.5 mg/day was prescribed. Local volumetric modulated arc therapy/intensity modulation radiation therapy was prescribed with a total dose of 54 Gy in 30 fractions. An 18F-fluorodeoxyglucose (18F-FDG) positron emission tomography scan was performed to detect other metastatic lesions but identified no obviously abnormal radiotracer uptake. Postoperative MRI demonstrated a gross total resection (Fig. 3A and B). Currently, at 32 months postsurgery, the patient is without clinical evidence of local recurrence of the primary malignancy.

3. Discussion

Pituitary adenoma is the most common cause of pituitary masses, constituting approximately 10% of all intracranial

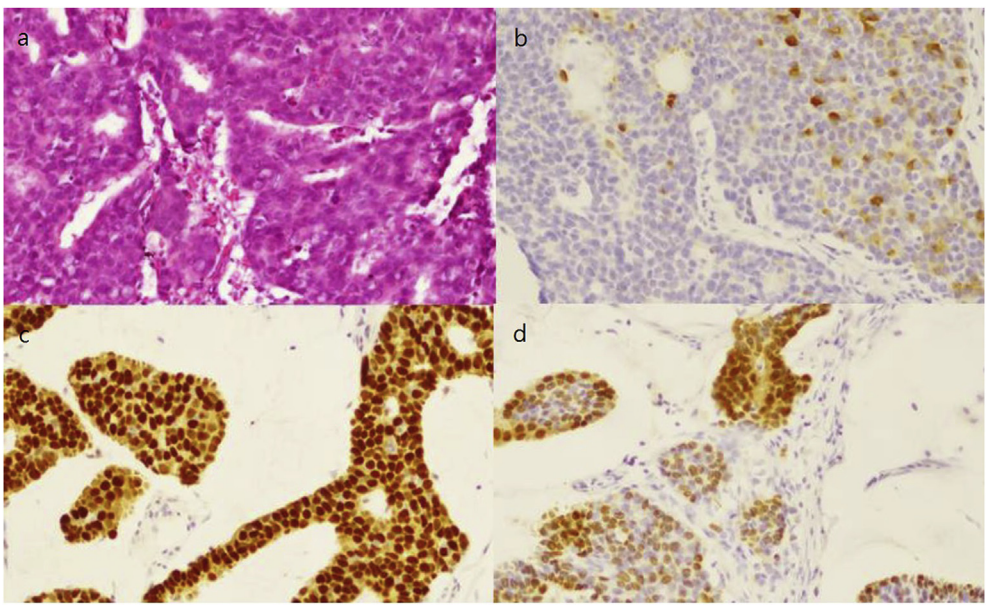

Fig. 2. Histological tumor specimens (magnification×100). (a) Hematoxylin and eosin staining of the pituitary metastatic tumor, clusters of small uniform cells floating in lakes of extracellular mucin. Immunohistochemical expression of (b) GCDFP 15 (focal positive), (c) ER, and (d) PR.

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