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Case Report

Nasal cavity metastasis of breast cancer: a case report and review of the literature

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Abstract: Objective: The nasal cavity is an uncommon site for metastasis to develop and thus metastases arising from breast cancer are rarely observed. We report a case of a 61-year-old female with two-year history of breast cancer who presented with a nasal cavity that was diagnosed as metastatic breast carcinoma by histopathological analysis of the nasal cavity specimen. Methods: We reviewed the clinical records of the patient and the appropriate world literature.Results: The patient had been diagnosed with breast cancer two years before. Her present complain was oculus dexter visual acuity decreased. CT and MRI scan revealed a palpable mass on the right nasal cavity. PET/CT demonstrated no additional uptake at the level of other organ. ER and PR demonstrated a similar expression pattern in primary breast carcinoma and nasal cavity lesions. As further treatment she received systemic palliative chemotherapy in addition to intravenous treatment with bisphosphonates, and a total dose of 36 Gy of X-ray (3 Gy per day, 12 fractions) was given to the local site of the right nasal cavity. Conclusion: In patient with a previous history of breast cancer who complains even of ophthalmologic symptoms such as visual acuity decreased, it is important to consider nasal cavity metastatic disease. 18FDG-PET/CT is useful to rule out the presence of other organ metastasis. Histopathological analysis may aid the diagnosis. The establishment of treatment strategies based on a comprehensive understanding of both etiology and pathophysiology is needed for rare cases such as this.

Keywords: Nasal cavity, metastasis, breast cancer, surgery

Introduction

Despite important progress in adjuvant and neoadjuvant therapies, metastatic disease often develops in breast cancer patients and remains the leading cause of their deaths. The most common site of breast cancer metastasis is the bone. Other common metastatic sites include the lungs, pleura, liver and brain [1]. The majority of metastatic lesions occur shortly after the detection of the primary tumor [2]. Metastases of breast cancer account for the majority of ocular and orbital metastases [3-6]. The nasal cavity is an uncommon site for metastasis to develop and thus metastases arising from breast cancer are rarely observed. However, since treatment strategies used to control primary and metastatic malignancies are different, accurate diagnosis appears important and may influence the prognosis and likelihood of a cure for lesions of the nasal cavity. Therefore, when encountering a patient with nasal cavity tumor, and with a long history of breast cancer, clinicians should be aware of the possibility of metastatic disease, until such a diagnosis can be ruled out. Then, besides collecting full clinical information, further histological analysis should be performed. Here, we report a case of nasal cavity metastasis arising from breast cancer. The nasal cavity metastasis appeared two years after the initial diagnosis of breast carcinoma and was confirmed by histopathological analysis.

Case report

The patient, a 61-year-old female, was diagnosed with an invasive ductal carcinoma in the left breast corresponding to T2 N1 M0 (cT2N1M0) by fine needle aspiration biopsy in March 2011. The patient subsequently received six cycles of neoadjuvant chemotherapy. A follow-up a left modified radical mastectomy was performed in June 2011. The patient remained

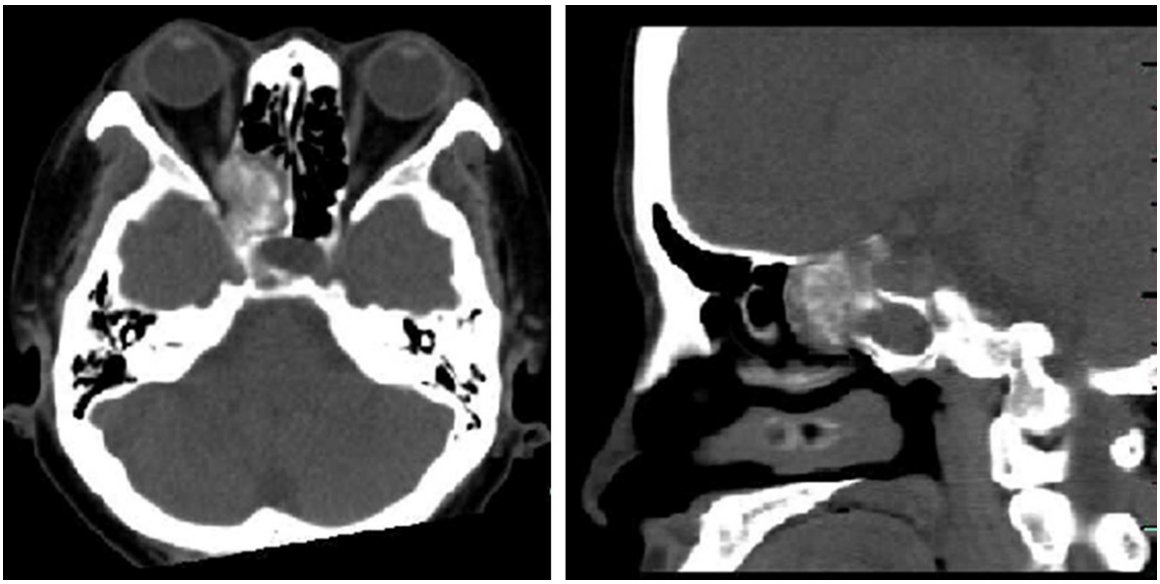

Figure 1. Computed tomography (CT) of the paranasal sinuses scan reveals large tumor mass of the right cavity, and the optic nerve was compressed.

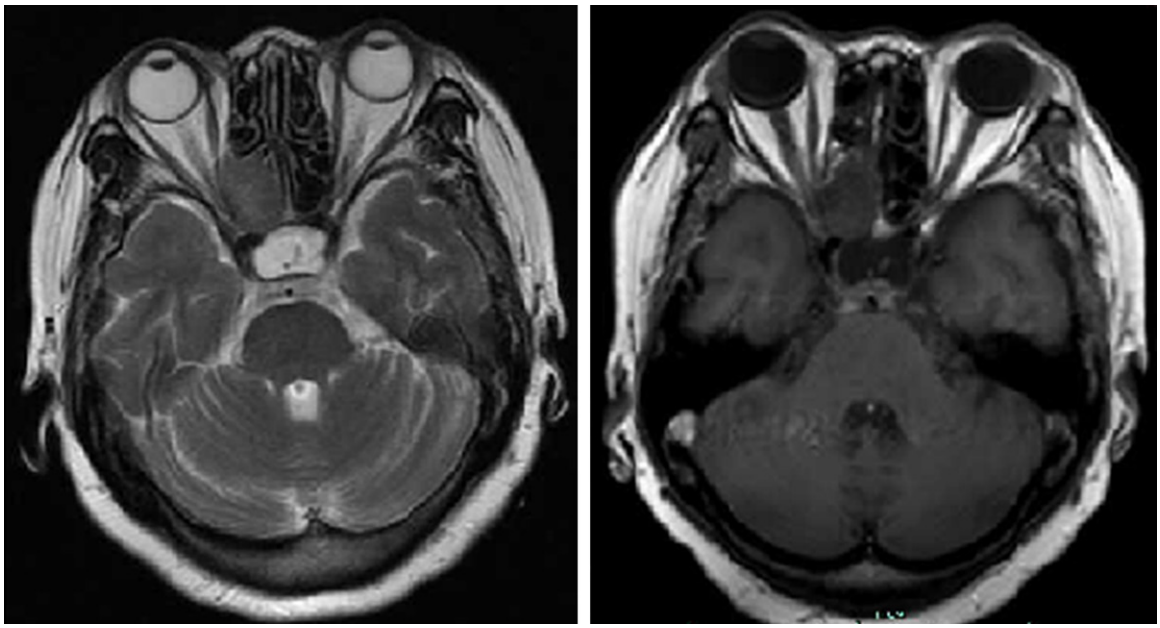

Figure 2. Magnetic resonance imaging (MRI) sections revealing a mass in the ethmoid sinus area of the right nasal cavity compressing the optic nerve.

free of disease until the current presentation. In June 2013, the patient complained with a two-week history of oculus dexter visual acuity decreased, CT (**Figure 1**) and MRI (**Figure 2**) presented with palpable masses on the right nasal cavity. 18FDG PET/CT (**Figure 3**) was performed for further evaluation. The maximum projection image of the PET revealed increased uptake in the right nasal cavity. In the region of the right nasal cavity, the intense FDG activity on PET corresponded well to a significantly thickened right nasal cavity on the CT and the fusion images. PET/CT demonstrated no additional uptake at the level of other organ.

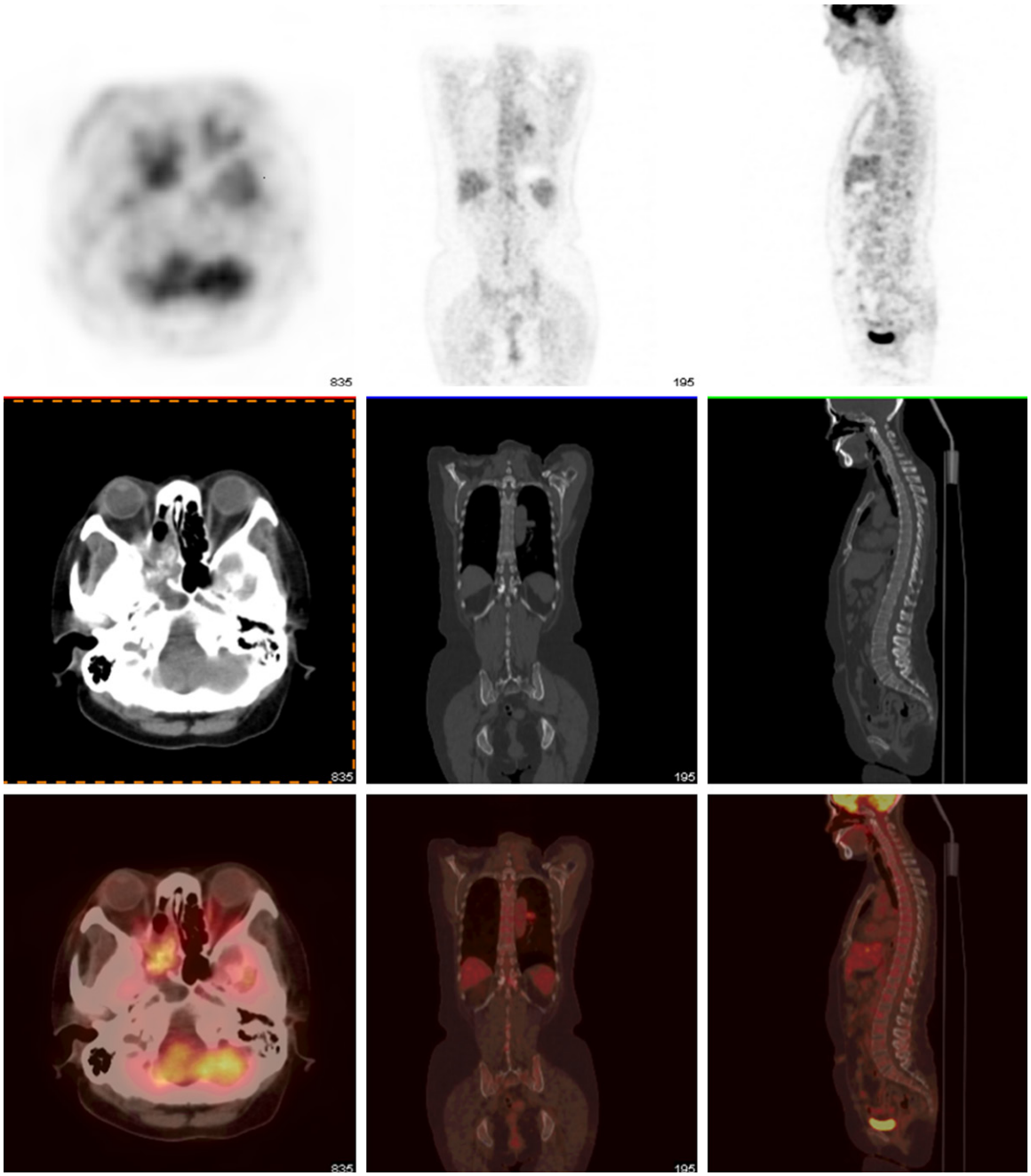

Figure 3. 18FDG PET/CT revealed increased uptake in the right nasal cavity, the intense FDG activity on PET corresponded well to a significantly thickened right nasal cavity on the CT and the fusion images. PET/CT demonstrated no additional uptake at the level of other organ.

Subsequently, the patient underwent nasal neoplasm resection through nasal endoscope. Histological assessment of the surgical nasal cavity specimens revealed multiple carcinoma foci. The microscopic and immunohistochemical findings confirmed that the nasal cavity masses were breast cancer metastases. The primary lesion excised from the left breast was a 32×24×30-mm invasive ductal carcinoma. The metastases excised from nasal cavity two years later were 12×18×24-mm in size.

The diagnosis of metastatic carcinoma was made based on immunostaining data for the estrogen receptor (ER) and progesterone receptor (PR) in neoplastic cells.

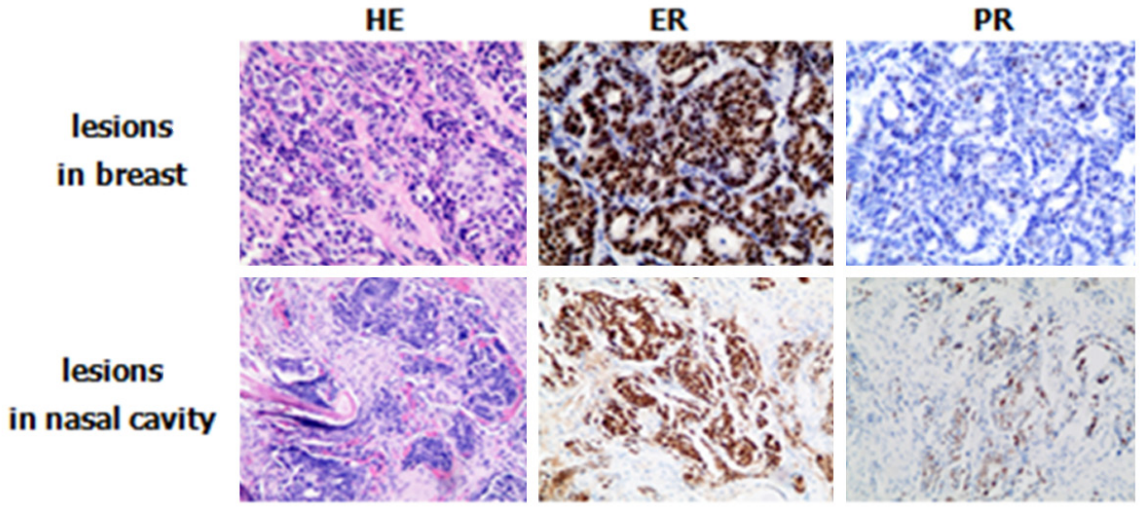

Figure 4. Hematoxylin and eosin (HE) staining and immunostaining (ER and PR) of malignant lesions from the breast and nasal cavity lesions. The malignant lesions from the breast and nasal cavity exhibited identical expression patterns for ER and PR (positive). Magnification, ×100. ER, estrogen receptor; PR, progesterone receptor.

Histologically, pleomorphic tumor cells from the breast carcinoma metastasis were intermingled with the nasal sinusitis mucosa (**Figure 4**, hematoxylin and eosin staining of the adenocarcinoma tissue in the breast and nasal cavity). In the nasal cavity, clusters of metastatic breast carcinoma cells were surrounded by a nomal nasal cavity mucosa component. Tumor cells in metastatic foci exhibited positive staining for the ER and PR, similar to the staining pattern of the primary breast lesion. As further treatment she received systemic palliative chemotherapy in addition to intravenous treatment with bisphosphonates, and a total dose of 36 Gy of X-ray (3 Gy per day, 12 fractions) was given to the local site of the right nasal cavity.

Discussion

In women about 23% of all diagnosed cases of cancer are of breast cancer, which is the highest amongst all the cancers accounting for about 7.6 million deaths worldwide each year [7]. One of the major causes of reduced survival in breast cancer patients is early tumor metastasis to different organs [8-10]. It has been rep-orted that, 10-16% of breast cancer patients present the problem of brain metastasis [11]. This study reports the observation of an uncommon metastatic site (nasal cavity) of breast carcinoma in a patient with a two-year history of breast cancer. Clinically evident metastases of non-nasal cavity malignancies to the nasal cavity are uncommon and usually, patients with metastatic nasal cavity lesions present with similar symptoms to primary lesions. Particularly in breast cancer, metastasis to the nasal cavity is rarely observed. 18FDG-PET/CT was useful to rule out the presence of other organ metastasis. In addition, given the long interval between the primary cancer and subsequent nasal cavity metastases, diagnosis of nasal cavity metastasis from breast carcinoma may be difficult. However, importantly, the diagnosis influences the prognosis and likelihood of a cure for lesions of the nasal cavity, and the treatment strategy used to control metastatic breast carcinoma is different from that used to treat primary nasal cavity malignancies. Therefore, a diagnosis of metastatic disease should be considered when new aggregates are identified in the nasal cavity of patients with a long-term history of breast cancer, until such a diagnosis can be ruled out.

To ascertain metastatic breast carcinoma in the nasal cavity, immunohistochemistry should be performed for the detection of specific markers. There are at least two types of marker that are required to be evaluated; the markers which possess a similar expression status in original and metastatic lesions and those that are capable of differentiating between metastatic lesions and the surrounding nasal cavity muco-

sa components. Clinically, ER and PR statuses are known to be correlated with breast cancer. As they provide important therapeutic and prognostic markers in the management of breast carcinoma [12], they are routinely evaluated. In this study, immunohistochemical staining of the ER and PR in postoperative nasal cavity specimens of patients were performed and they all demonstrated a similar expression pattern with primary breast carcinoma; positive for ER and PR (**Figure 4**).

Generally, patients with nasal cavity metastasis are not good candidates for nasal cavity surgery to remove the tumoral mass, since this will not cure the disease [13, 14]. Nevertheless, in certain cases where the tumor grows slowly, removing the metastasis together with the primary tumor may improve the patient's prognosis [13]. Whenever the nasal cavity tumor leads to pain or loss of vision, palliative treatments may be undertaken in the form of radiotherapy, chemotherapy or even surgery. Radiotherapy treatment in these cases ranges from 3,000 to 4,000 rad (20 to 40 Gy) distributed in several doses throughout one or two weeks, so that remittal improves the symptoms, including in some instances recovery of vision [15]. Hormonal therapy has also been used as palliative treatment in metastases associated to hormone-sensitive cancers, such as prostate and breast cancer. In present study, the patient received systemic palliative chemotherapy in addition to intravenous treatment with bisphosphonates, and a total dose of 36 Gy of X-ray (3 Gy per day, 12 fractions) was given to the local site of the right nasal cavity. However, the prognosis of metastases from distant organs, to the nasal cavity and paranasal sinuses is miserable, the patient in the follow-up.

In general, based on the present study, we conclude that although knowledge of a patient's complete clinical history is extremely useful, 18FDG-PET/CT was useful to rule out the presence of other organ metastasis, immunohistochemical analysis should be performed to confirm the diagnosis of metastatic breast cancer. Similar staining results for ER and PR in breast and nasal cavity may aid the diagnosis of nasal cavity carcinoma derived from metastatic breast cancer. The establishment of treatment strategies based on a comprehensive understanding of both etiology and pathophysiology is needed for rare cases such as this.

Disclosure of conflict of interest

None.

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References

[1] Irvin W Jr, Muss HB and Mayer DK. Symptom management in metastatic breast cancer. Oncologist 2011; 16: 1203-1214.
[2] Lam KY and Lo CY. Metastatic tumors of the thyroid gland: a study of 79 cases in Chinese patients. Arch Pathol Lab Med 1998; 122: 37-41.
[3] Merrill CF, Kaufman DI, Dimitrov NV. Breast cancer metastatic to the eye is a common entity. Cancer 1991; 68: 623-627.
[4] Fenton S, Kemp EG, Harnett AN. Screening for ophthalmic involvement in asymptomatic patients with metastatic breast carcinoma. Eye (Lond) 2004; 18: 38-40.
[5] Eckardt AM, Rana M, Essig H and Gellrich NC. Orbital metastases as first sign of metastatic spread in breast cancer: case report and review of the literature. Head Neck Oncol 2011; 3: 37.
[6] Reeves D, Levine MR, Lash R. Nonpalpable breast carcinoma presenting as orbital infiltration: case presentation and literature review. Ophthal Plast Reconstr Surg 2002; 18: 84-88.
[7] Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. CA Cancer J Clin 2011; 61: 69-90.
[8] O'Shaughnessy J. Extending survival with chemotherapy in metastatic breast cancer. Oncologist 2005; 10 Suppl 3: 20-29.
[9] Chang EL, Lo S. Diagnosis and management of central nervous system metastases from breast cancer. Oncologist 2003; 8: 398-410.
[10] Lassman AB, DeAngelis LM. Brain metastases. Neurol Clin 2003; 21: 1-23.
[11] Lin NU, Bellon JR, Winer EP. CNS metastases in breast cancer. J Clin Oncol 2004; 22: 3608-3617.
[12] Frisk G, Svensson T, Backlund LM, Lidbrink E, Blomqvist P, Smedby KE. Incidence and time trends of brain metastases admissions among breast cancer patients in Sweden. Br J Cancer 2012; 106: 1850-1853.
[13] Kamiński B, Kobiorska-Nowak J, Bień S. [Distant metastases to nasal cavities and paranasal sinuses, from the organs outside the head and neck]. Otolaryngol Pol 2008; 62: 422-5.

[14] Azarpira N, Ashraf MJ, Khademi B, Asadi N. Distant metastases to nasal cavities and paranasal sinuses case series. Indian J Otolaryngol Head Neck Surg 2011; 63: 349-52.

[15] Rootman J. Diseases of the orbit. 2nd edition. Baltimore: Lippincot Williams & Wilkins; 2003. pp. 330-343.