

Parotid gland metastasis from carcinoma of the breast detected by PET/CT

Case report and review

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Abstract

Rationale: The parotid gland is an unusual site for metastatic disease from breast cancer, and it usually has a poor prognosis.

Patient concerns: A 36-year-old woman presented to our department with a swelling in her left parotid gland. The patient did not receive any other treatment after breast conserving surgery.

Diagnoses: Multifocal metastases in the bones, lymph nodes, left parotid and contralateral mammary gland were proved by PET/CT.

Interventions: Eight cycles of first-line rescue chemotherapy, combining with zoledronic acid in treatment of bone metastasis, followed by the combination of endocrine therapy and ovarian function suppression after chemotherapy.

Outcomes: The patient obtained clinical complete response in the metastasis tumor of parotid gland, lymph nodes, and bones.

Lessons: It is necessary for patient to receive comprehensive treatment after receiving surgery. Through this case, we present the appropriate management of advanced breast cancer accompanying with the parotid gland metastasis. PET/CT is a useful method to diagnose and evaluate the metastasis lesions.

Abbreviations: ER = estrogen receptor, HER-2 = human epidermal growth factor receptor-2, IHC = immunohistochemistry, PET/CT = positron emission tomography/computed tomography, PR = progesterone receptor, SUV = standardized uptake value.

Keywords: breast cancer, diagnosis, parotid gland metastasis, PET/CT, treatment

1. Introduction

Bone, liver, lung, and brain are the most common places of metastases in the breast cancer.^[1] Metastasis to the parotid gland from breast cancer is extremely rare and has a poor prognosis,^[1–3] and only 21 cases have been reported from 1982 to 2017. We report a case of a 36-year-old woman with metastases to unilateral parotid glands detected by positron emission tomography/computed tomography (PET/CT) for primary carcinoma of the breast.

2. Case report

A 36-year-old woman presented to our department with a swelling in her left parotid gland, not able to close her left eye completely, and the corner of the mouth turned to the right when smiling like peripheral facial paralysis (Fig. 1) in May 2017, which appeared

two months ago. Meanwhile, the patient presented with right upper limb and right shoulder pain. The study has been approved by the Shandong Cancer Hospital Affiliated to Shandong University Ethics Committee (No. SDTHEC20171004). Written, informed consent was obtained from the patient.

The patient was diagnosed with carcinoma in left breast in January, 2015, and received breast conservative surgery and axillary lymph node dissection in another hospital. Invasive ductal carcinoma of 1.2 cm × 1.0 cm and grade II with lymph vessel invasive were confirmed by routine pathology examination, and all margins were negative, whereas 2 of 22 lymph nodes were metastases. Positive by immunohistochemistry (IHC) for estrogen receptor (ER) (70% of nuclei stained) and progesterone receptor (PR) (about 50% of nuclei stained), and negative for human epidermal growth factor receptor-2 (HER-2) by IHC. The average Ki-67 labeling index was 40%, which belonged to luminal B subtype. Adjuvant chemotherapy, radiotherapy, and endocrine therapy were recommended according to the clinical practice guideline of breast cancer, but all strategies for postoperation treatment were declined by the patient.

Because patient did not receive any treatments after breast cancer surgery, distant metastases were suspected when admitted first time to our department. So, PET/CT was recommended to the patient. The results of PET/CT revealed accumulation of standardized uptake value (SUV) 6.5 in the parotid gland (Fig. 2) and identified a hypermetabolic mass in the contralateral side of the primary lesion (right breast) with a SUV 5.3. Additionally, PET/CT scan found multiple lymph nodes metastases (including left rotter lymph node, left supraclavicular lymph node, right hilar region lymph node, and mediastinal lymph node), multiple bone metastases, and bilateral interlobular pleural metastasis.

Lumpectomy of the mass in the right breast was performed, and invasive carcinoma was confirmed by routine pathology

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Figure 1. Patient accompanying with mouth disorder and the symptom of peripheral facial paralysis.

examination. The results of IHC were as follows: ER (+50%), PR (–), Her-2 (–). The average Ki-67 labeling index was 2%. The molecular subtype was also luminal B. According to the conclusion of multidisciplinary team, the patient decided and received 8 cycles of first-line rescue chemotherapy (4 cycles of bi-weekly epirubicin [100 mg/m²] plus cyclophosphamide [600 mg/m²], followed by 4 cycles of 3-weekly docetaxel [100 mg/m²]), combining with 4 mg zoledronic acid in treatment of bone metastasis every 4 weeks, followed by the combination of endocrine therapy (Tamoxifen 10 mg, twice daily) and ovarian function suppression (Goserelin 10.8 mg, every 3 months) after chemotherapy. No serious side effects were found. The size of the tumor in the parotid gland was clinical complete response revealed by PET/CT examination after 8 cycles of chemotherapy (Fig. 3). Follow-up 6 months after chemotherapy, the patient is in stable condition and undergoing endocrine therapy.

3. Discussion

With the deepening understanding of the biological characteristics of breast cancer, it is a systemic disease which could not be cured by surgical treatment in most cases.^[4] Comprehensive treatment is particularly important for this disease. The administration of systemic therapy after surgery has been shown to significantly improve both disease-free and overall survival,^[5]

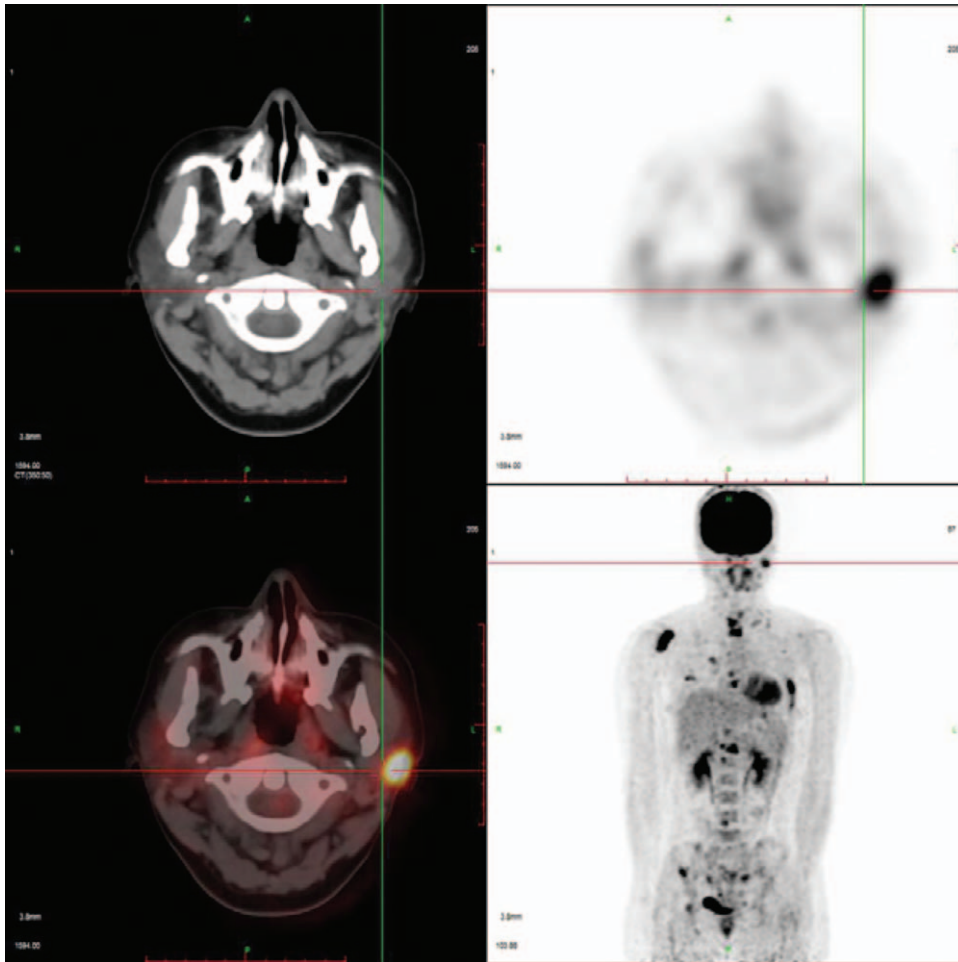


Figure 2. Positron emission tomography/computed tomography (PET/CT) scanning revealed accumulation of SUV 6.5 in the left parotid gland before combination therapy. SUV = standardized uptake value.

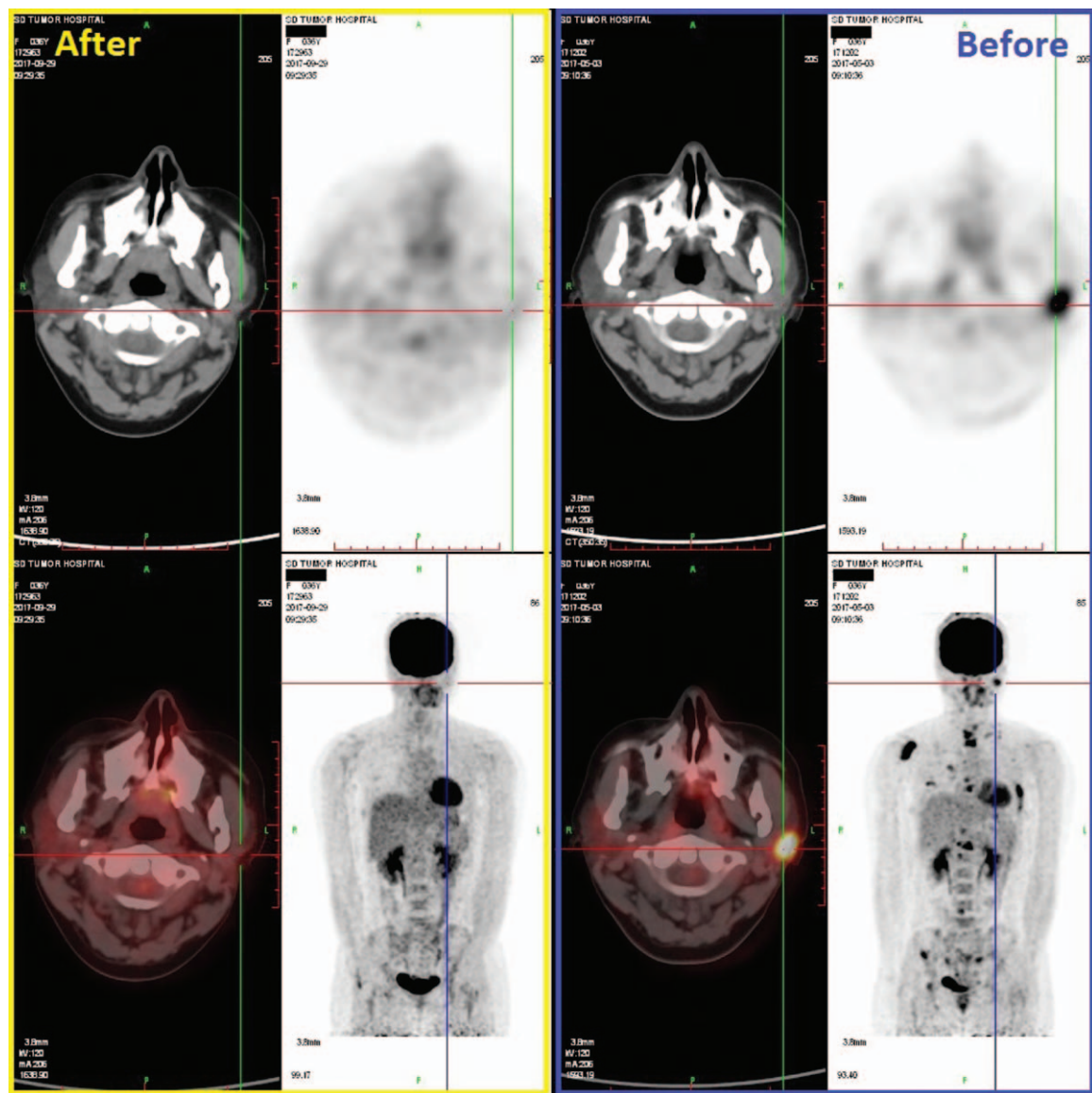


Figure 3. Positron emission tomography/computed tomography (PET/CT) scanning imaging compared after combination therapy with before therapy.

and the proportional reductions in rates of recurrence and mortality were independent of the administration of systemic therapy.^[6] The role of doctor in the clinical management includes informing patients about the importance of systemic treatment if the patient needs to receive. In this case, if the patient receives adjuvant chemotherapy, radiotherapy, and endocrine therapy, she might have a good prognosis and would not have had such distant metastases so soon.

The parotid glands are the largest major salivary glands. The tumor of salivary duct carcinoma occurs in the parotid glands in about 80% of cases.^[3] Malignant parotid gland accounts for approximately 9% to 14% of all parotid tumors.^[1] The majority of metastases in the parotid gland usually arise from primary tumors of the head and neck, and more common in older men.^[7-9] The metastases from infraclavicular malignancies are rare (0.16%–0.4%), and most often use the hematogenous route.^[10] Up to 30% to 40% of the patients with malignant tumor in parotid gland have symptoms similar to a peripheral facial

paralysis.^[11] In this case, the patient presented with a palpable mass and mouth disorder. Based on the symptom of peripheral facial paralysis, brain metastasis was first suspected before the full body detection with imaging technique. Thus, PET/CT scan is recommended to evaluate loco-regional and look for distant disease.^[2,12]

Fine needle aspiration cytology is an important management of diagnose of parotid metastases which has an 85% accuracy in distinguishing between malignant and benign lesions of the parotid and can differentiate primary neoplasms of the parotid from metastatic disease.^[2,13] Generally, treatment of parotid metastatic disease is a combination of surgical removal of solitary tumors, chemotherapy, radiation therapy, and endocrine therapy. The management of a sole parotid metastasis from breast is still controversial. An appropriate parotidectomy with negative margins and with preservation of the facial nerve followed by postoperative radiotherapy would be the protocol for most tumors restricted to the parotid.^[2,14] Because the parotid was not

the only lesion metastasis in this patient, parotidectomy and radiotherapy were not recommended. Therefore, we first recommend the combination strategy of chemotherapy and endocrine to this patient.

The prognosis of such patients with parotid metastasis is usually poor, with a 5-year survival rate of only 10%.^[2,3] Although solitary parotid metastasis with longer disease-free survival are considered as good prognostic factors, many authors consider that parotid surgery does not improve life expectancy.^[2] However, palliative management should be recommended to all patients with parotid metastasis.

In conclusion, operable breast cancer is a systemic disease, and patients should receive systematic treatment to improve survival. Metastasis to the parotid gland from breast cancer is rare and usually with poor prognosis, and PET/CT detection could help to find and diagnose it. A total parotidectomy and adjuvant radiotherapy could offer to patients for solitary metastasis of the parotid. Otherwise, palliative treatment should be recommended.

Author contributions

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