

Clinical note

Primary epithelioid trophoblastic tumor with a synchronous breast carcinoma detected only with FDG-PET/CT Scan

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ABSTRACT

Epithelioid trophoblastic tumor is a recently described, rare and distinctive type of gestational trophoblastic tumor. We report the case of a 31-year old patient who had a full-term pregnancy 18 months before presentation. She had a right axillary lymph node metastasis and was referred for FDG-PET/CT scan for evaluation of distant metastasis and to detect primary malignancy. The axillary lymph node biopsy revealed metastatic breast carcinoma. FDG-PET/CT revealed increased uptake of right axillary lymph node, soft tissue density lesion with a diameter of 24 mm on left cervical region with increased FDG uptake, increased uptake on cervical region and left inguinal lymph node with increased uptake. Pelvic MRI imaging and ultrasonography were negative for malignancy in cervical region. Biopsy of the lesion was consistent with epithelioid trophoblastic tumor in cervical region. Gestational trophoblastic tumor was not suspected because she had no signs such as abnormal vaginal bleeding. FDG-PET/CT demonstrated the primary lesion in cervical region. We report a rare case of primary epithelioid trophoblastic tumor detected only with FDG-PET/CT scan which synchronized with breast carcinoma.

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Tumor primario trofoblástico epitelioides y carcinoma sincrónico de mama detectado sólo con FDG-PET/CT

RESUMEN

El tumor trofoblástico epitelioides es un raro tumor gestacional recientemente descrito. Una paciente de 31 años, que tuvo un embarazo a término hace 18 meses, presentó una adenopatía axilar derecha. Se realizó una gammagrafía PET/TAC con FDG (FDG PET/TAC) para evaluar metástasis a distancia y para detectar el tumor primario. La biopsia de la adenopatía axilar demostró metástasis por carcinoma de mama. La FDG PET/TAC identificó aumento de captación en la adenopatía axilar derecha, una lesión de densidad de partes blandas con diámetro de 24 mm en la región cervical izquierda con captación de FDG aumentada, captación cervical aumentada y en una adenopatía inguinal izquierda. La RNM y la ecografía pélvicas fueron negativas para malignidad. La biopsia de la lesión en cérvix se informó de tumor trofoblástico epitelioides. Clínicamente, el tumor no se sospechó por la ausencia de signos como el sangrado vaginal anómalo. La FDG PET/TAC descubrió la lesión primaria en el cérvix. En este caso clínico, presentamos un raro tumor trofoblástico epitelioides detectado por FDG PET/TAC sincrónico con un cáncer de mama.

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Palabras clave:

Tumor trofoblástico epitelioides

FDG PET/TAC

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Introduction

The incidence of multiple primary cancers is reported to be between 0.3% and 4.3%.¹ The second primary lesion is identified either simultaneously with the primary lesion (synchronous) or after a period of time (metachronous). Epithelioid trophoblastic tumor is a rare type of gestational trophoblastic tumor which is seen among reproductive age group. It can be associated with any gestational event in women.

We report a rare case of primary epithelioid trophoblastic tumor detected only with Fluorine-18 Fluorodeoxyglucose (¹⁸F-FDG)

positron emission tomography/computed tomography (PET/CT) scan which synchronized with primary breast carcinoma. To best of our knowledge synchronous presentation of breast cancer and epithelioid trophoblastic tumor has not been reported previously in the literature.

Case report

A 31 year-old female diagnosed of axillary metastases from breast carcinoma 18 months after a pregnancy was referred for FDG-PET/CT scan for evaluating distant metastases and detecting primary malignancy. The patient's pregnancy was full-term at 40 week, with caesarean section. She had delivered her forth child. Biopsy of the axillary lymph node was diagnosed as metastatic breast carcinoma (fig. 1A) Immunohistochemically axillary node

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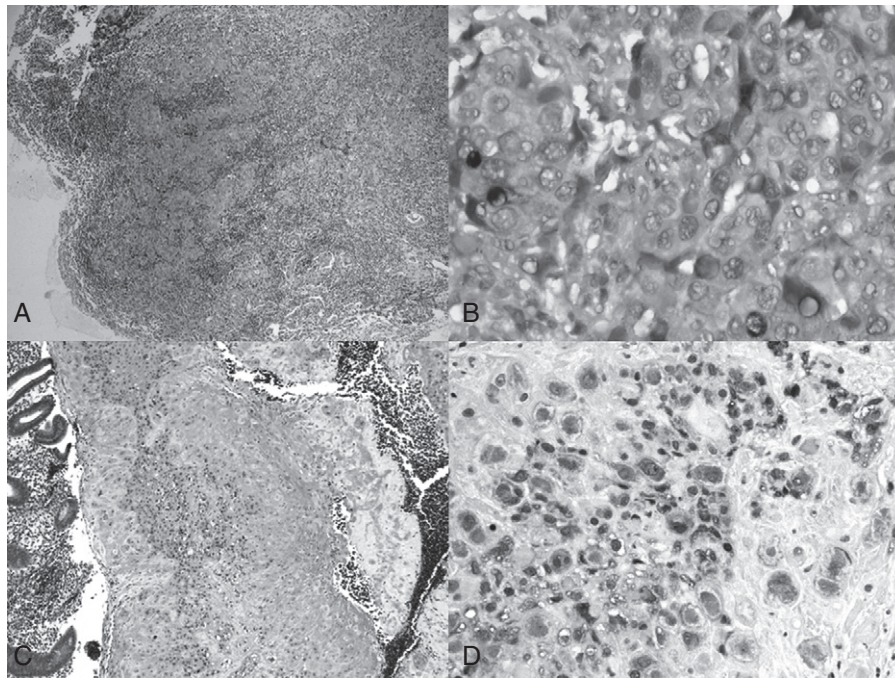


Figure 1. Biopsy of the axillary lymph node was diagnosed as metastatic breast carcinoma (A). Immunohistochemically axillary node was negative for ER, PR, CERB B2 and positive for Pan CK, EMA, mammoglobin and GCDFP-15 (B). The histological specimen revealed a tumoral lesion composed of round intermediate trophoblastic cells with hyperchromatic pleomorphic nuclei and light eosinophilic cytoplasm (C). Tumor cells are positive immunohistochemically for inhibin- α (D).

was negative for ER, PR, CERB B2 and positive for Pan CK, EMA, mammoglobin and GCDFP-15 (fig. 1B). Triple negative infiltrating ductal carcinoma with columnar cell change was diagnosed. Dual-modality FDG-PET/CT imaging was performed after intravenous injection of 370 Mega Becquerel (10 mCi) ^{18}F -FDG with a PET/CT scanner (Biograph, Siemens) from the top of the head to the feet. PET attenuation correction was based on the CT data and coregistered attenuation corrected PET image and CT image were reviewed (figs. 2 and 3). FDG-PET/CT revealed increased uptake of right axillary lymph node with a diameter of $22 \times 32 \times 36$ mm (fig. 2A and fig. 3A-arrows). Maximum calculated standardized uptake value (SUVmax) of the lesion was 8.45. Additionally, soft tissue density lesion with a diameter of 24 mm on left cervical region with increased FDG uptake (SUVmax: 6.88), increased uptake on cervical region (SUVmax: 9.21) and left inguinal lymph node with a diameter of 12 mm (SUVmax: 2.73) were observed on FDG-PET/CT imaging (fig. 2B, figs. 3B, C, D, E-arrows). No additional findings were observed in FDG-PET/CT. Pelvic MRI imaging and ultrasonography were found negative for malignancy in cervical region. Figure 4 illustrates sagittal MRI image. Bone scintigraphy was negative for bone metastasis. The patient was diagnosed of epithelioid trophoblastic tumor in cervical region on fractional curettage. The histological specimen revealed a tumoral lesion composed of round intermediate trophoblastic cells with hyperchromatic pleomorphic nuclei and light eosinophilic cytoplasm (fig. 1C). Immunohistochemistry showed the tumor cells were negative for β HCG, mammoglobin and GCDFP and positive for Pan CK, EMA and inhibin- α (fig. 1D). Axillary lymph node specimen was also stained with inhibin- α and β HCG and found to be negative. FDG-PET/CT demonstrated the primary lesion in cervical region. Pelvic radiation and chemotherapy were initiated after abdominal hysterectomy. Although axillary lymphadenopathy was consistent with metastatic breast carcinoma histopathologically and immunohistochemically, the primary focus of breast wasn't detected with mammography, breast MRI and FDG-PET/CT scan. So mastectomy is planned after chemotherapy.

According to our knowledge, this is the first report describing FDG-PET/CT findings of primary epithelioid trophoblastic tumor.

Discussion

Gestational Trophoblastic disease (GTD) is a heterogeneous group of diseases including hydatidiform mole, invasive mole,

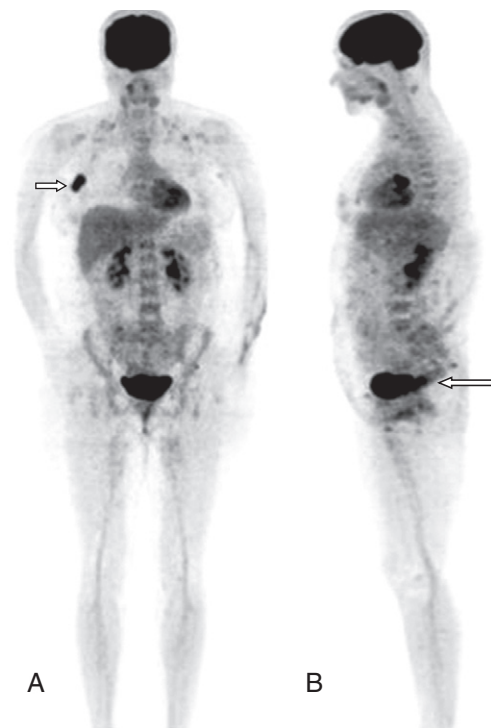


Figure 2. Maximum intensity projection image (MIP) illustrates axillary lymph node FDG uptake (arrow) (A). Sagittal whole-body PET/CT image shows an area with increased uptake in cervical region (arrow) (B).

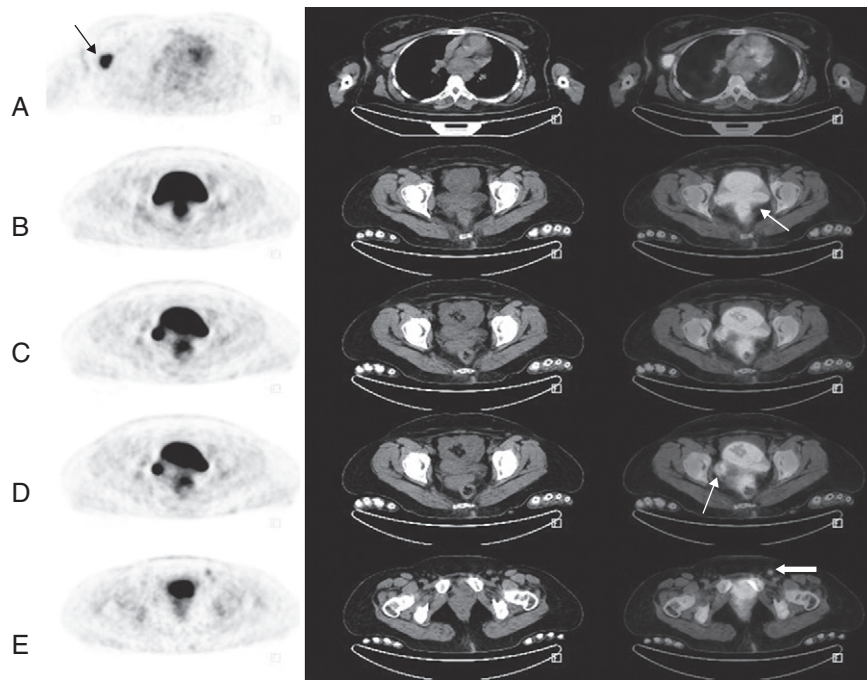


Figure 3. Axial PET, CT and PET/CT fusion images demonstrate axillary lymph node (arrow) (A), increased uptake in cervical region (arrows) (B,C,D) and left inguinal nodal uptake (arrow) (E).

choriocarcinoma, placental site trophoblastic tumor and epithelioid trophoblastic tumor. Epithelioid trophoblastic tumor is a recently described, rare and distinctive type of gestational trophoblastic tumor. The tumor derives from intermediate trophoblastic cells of the chorion leave while placental site trophoblastic tumor derives from intermediate trophoblastic cells of the placental bed.² Most patients with this tumor at presentation are in the reproductive age group. The most common presentation is abnormal vaginal bleeding. Serum hCG level is usually mildly elevated. In this case the patient was asymptomatic and serum hCG level was not elevated during the diagnosis and follow up. Epithelioid trophoblastic tumor is usually located in the fundus, lower uterine segment or endocervix. This type of tumor can be associated with any gestational event. Histopathologically islands

of trophoblastic cells are surrounded by extensive necrosis. 'Geographical pattern' is characteristic of this lesion. The cells contain round nuclei and eosinophilic or clear cytoplasm and only focally express immunostaining for hPL, hCG, cytokeratin, and inhibin- α . The growth pattern of this type tumor resembles to placental site trophoblastic tumor (PSTT). In comparison with PSTT, the cells are smaller with a less nuclear pleomorphism and grow in a nodular pattern. Epithelioid trophoblastic tumor can be associated with any gestational event in younger women, but can also be diagnosed more than 10 years after the last known pregnancy or in post-menopausal women.^{3,4} In our case the last pregnancy of the patient was eighteen months before.

PET has emerged as an important imaging modality with a various applications especially in oncology, cardiology and neurology. PET has been used extensively in oncologic imaging especially when combined with X-Ray CT. Breast cancer is a common cause of cancer deaths in middle-aged women. ^{18}F -FDG-PET has been shown moderately high sensitivity for detecting primary breast tumors. Overall, sensitivity and specificity ranged from 80-100% and 75-100%, respectively.⁵ ^{18}F -FDG is the most widely used radiotracer in the evaluation of breast cancer. FDG-PET is known to show low sensitivity in lobular carcinomas, well-differentiated carcinomas and lesions smaller than 1 cm.⁵ Tumor size and axillary lymph node status are the most important prognostic factors in tumor staging. FDG-PET and PET/CT may be helpful in staging and establishing distant metastases. In a study including 70 patients with suspected breast cancer recurrence, the sensitivity and specificity of ^{18}F -FDG/CT is reported 87.8 and 86.4% respectively.⁶ FDG-PET/CT imaging allows whole body screening and therefore it is important for distant metastases and synchronize malignancies. Functional information provided from PET portion is combined with anatomical information from CT portion of the PET/CT that is useful for staging of a variety of neoplasms. So far, only few reports have been published on the use of ^{18}F -FDG-PET/CT in GTT.⁷⁻¹¹ In a pilot study by Chang TC et al ^{18}F -FDG-PET was found useful in selected patients with GTT, by providing more precise mapping of the metastases upfront, monitoring treatment response and localising viable tumors after combination chemotherapy.¹⁰



Figure 4. Sagittal T2-weighted MRI of the cervix shows normal appearance of endocervical mucosa (arrows). No tumoral focus is seen.

Here, we report a breast cancer patient with axillary nodal involvement in whom FDG-PET/CT revealed a synchronize gestational trophoblastic tumor in cervical region. FDG-PET/CT imaging was performed from the top of the head to the feet hence, pelvic region was included in the field of view. In this interesting case, FDG-PET/CT demonstrated a second primary lesion in cervical region.

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