

Incidental Breast Cancer Identified by (18)F-Fludeoxyglucose Positron Emission Tomography/Computed Tomography as a Third Primary Tumor in an Elderly Woman: A Case Report

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ABSTRACT

INTRODUCTION

The association of three primary tumors in an elderly woman is rare, mostly the discovery of the third malignancy is unusual detected by FDG-PET. We present an unusual case of an 87-year-old woman, with a medical history of two primary cancers in 18F-FDG PET/CT follow-up that showing a focus of intense shooting in the left breast. Mammography and breast ultrasound confirmed the diagnosis of a breast cancer. The patient underwent breast-conserving surgery of the left breast and histopathological and immunohistochemical examinations confirmed the presence of papillary carcinoma, with intraductal carcinoma microfocula, positive for estrogen and progesterone receptors and negative for epidermal growth factor receptor-2. The patient subsequently underwent hormone therapy. Clinical and radiological follow-up at 6 and 12 months after surgery without any sign of recurrence and metastasis. 18F-FDG PET/CT studies showed the highest detection rate of accidental breast lesions.

KEYWORDS

Breast cancer; Breast incidentalomas; Incidental breast lesions; PET/CT

INTRODUCTION

The frequent recourse to radiological investigations as well as the availability of increasingly sophisticated techniques, capable of providing high-resolution images, have led to a surge in the detection of incidentalomas, defined as incidental imaging findings, fortuitously

diagnosed in an asymptomatic patient or symptomatic patient undergoing radiological investigations for an unrelated reason. Incidentalomas pose several problems for both the doctor and the patient, as, in consideration of the dubious nature of these findings and the consequential need for further diagnostic study [1].

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In this case the intense up-take of FDG in the left breast in a woman with a previous diagnosis of lymphoma led to suspect that there was a recurrence of the disease at this level, subsequent diagnostic tests were fundamental to clarify the nature of the third malignancy.

Positron Emission Tomography/Computed Tomography (PET/CT) is an imaging technique used for diagnostic and staging purposes that has been shown to detect accidental cancer in asymptomatic patients [2]. Various studies have been conducted in recent decades with the aim of calculating the prevalence and outcomes of incidentalomas following a total body Fludeoxyglucose Positron Emission Tomography/Computed Tomography (FDG-PET/TC), such as medullary thyroid cancer, lung cancer, meningioma and breast lesions [2-10]. In particular, 18F-FDG PET / CT exams showed the highest detection rate of accidental breast lesions and the highest rate of malignancy (up to 50% of patients) [6-8,10]. Further evaluation such as biopsies is needed to define the etiology of these uncommon and unexpected FDG avid foci to distinguish malignant from benign lesions [8, 9].

Through this report, we present the case of a 87-year-old woman, with a clinical history of uterine adenocarcinoma and intestinal Hodking lymphoma, in follow-up with annual 18F-FDG PET/CT, by which she incidentally discovered a primary breast neoplasm.

CASE PRESENTATION

The following is the case of a patient of 87-year-old, multiparous, with no family history of oncological diseases who was diagnosed with uterin adenocarcinoma in 2012 and underwent laparoscopic hysterо-annesiectomy, pelvic and bilateral obturator lymphadenectomy, omentectomy and appendectomy. During the surgery, suspicious lymph nodes were found at the root of the mesentery and a biopsy was performed.

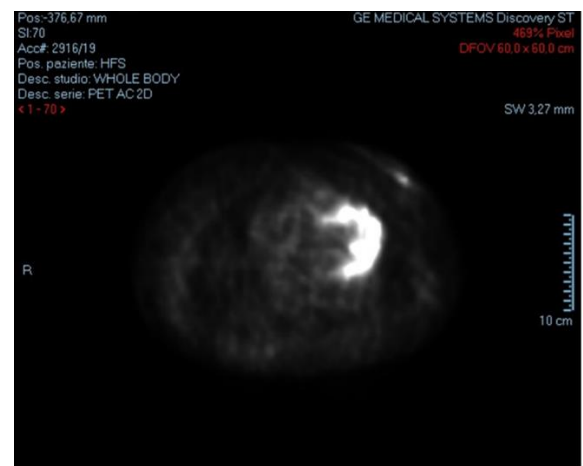


Figure 1: 18F-FDG PET/CT with a unusual glucose uptake was observed in the left mammary gland, specifically in a retro areolar small area of focal uptake, with a SUV max of 4.7, strongly suggestive of breast lesion.

Afterwards, the patient undertook 18F-FDG PET/CT, which revealed intense and increased glucose metabolism in correspondence of the intestinal lymph nodes and a massive formation in the mesogastrium, which encompassed some intestinal loops. The report of the histological examination showed evidence of Hodking lymphoma (a variant of the nodular sclerosis, type) and the patient underwent a second surgery, adjuvant chemotherapy (6 cycles of chemotherapy) and continued the follow-up with annual 18F-FDG PET/CT.

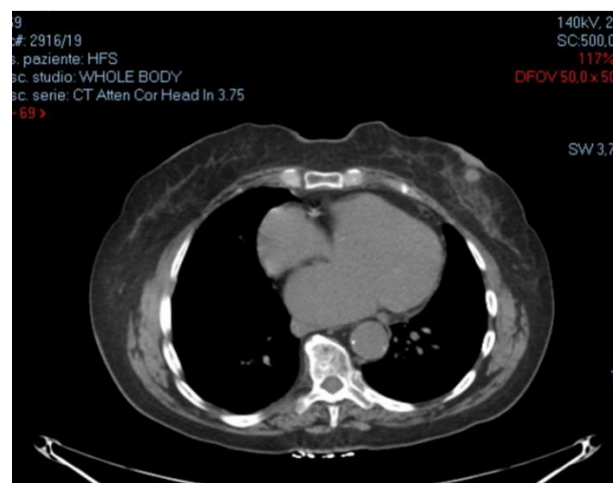


Figure 2 : CT image of the lesion positioned in the retro areolar area.

In October 2019, an 18F-FDG PET/CT was performed and an unusual glucose uptake was observed in the left mammary gland, specifically in a retro areolar small area

of focal uptake, with a maximum standardized absorption value(SUVmax) of 4.7, strongly suggestive of breast cancer. Therefore, the patient underwent bilateral mammography, confirming the presence of an opacity, with lobulated contours and a diameter of 11 mm, in the retro areolar area. A true cut biopsy of the lesion was performed and it allowed to diagnose a papillary carcinoma.

The patient was subjected to surgical evaluation at our breast center and, taking account of her comorbidities and her age, was given indication for a quadrantectomy centered on the retro areolar nodule, with local anesthesia.

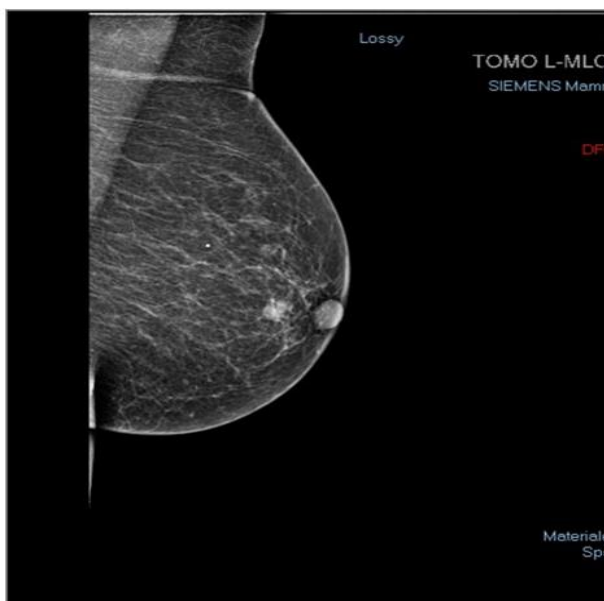


Figure 3: Suspected radiopacity confirmed on mammography.

The histological examination revealed the presence of papillary carcinoma with tumor grading 2, intraductal carcinoma microfocula of solid type and low nuclear grade, estrogen receptor positive(ER +100%), pregesteron receptor positive (PgR+100%) , low proliferation index (Ki67 5%) and negative epidermal growth factor receptor-2 (HER 2 -). In consideration of the biological and immunohistochemical characteristics of the disease, in agreement with the patient, the patient's comorbidities and the high anesthetic risk, with the oncological team gave indication to hormonal treatment

for 5 years. The patient remains well without any sign of recurrence and metastasis at 12 months after surgery.

DISCUSSION

As the radiological investigations increase, over the time, the possibility of detecting unexpected pathological findings in locations not related to the original diagnostic inquiry also have been raised. Therefore, an incidental finding is defined incidentaloma. The significance of incidental findings is disputed considering that, for instance, unexpected focal breast absorption of 18F-FDG during FDG PET/CT may be due to breast cancer or non-malignant breast lesion [11,12]. There are not unequivocal recommendations yet on how to differentiate malignant from benign absorption observed with FDG-PET, even if several studies have attempted to develop a diagnostic algorithm using both breast reporting and data system (BI-RADS) criteria and maximum standardized absorption value (SUVmax) [13]. The need to unequivocally comprehend FDG PET/CT imagings is increasingly strong considering its use in cancer follow-up, particularly in breast cancer patients, for staging and re-staging, monitoring responses to therapy and the definition of prognosis [14]. In this case, the patient's oncological history, age, mammographic characteristics and a strongly avid FDG lesion, led us to suspect a malignant neoplasm. Considering the previous abdominal lymphoma, we also thought it was a rare case of breast lymphoma, denied by the histological examination which confirmed the patient's third primary tumor which remains an extremely rare event.

CONCLUSION

18F-FDG PET/CT is a low-sensitivity test, invalidated by a high rate of false negatives in the case of small, non-palpable (<1 cm) and low grade early stage tumors. For this reason it is not, currently, recommended for the primary diagnosis of breast cancer. Its indication is justified in the detection of loco-regional recurrences or distant metastases in locally advanced breast cancer [15].

This clinical case suggests that any breast incidentaloma requires further investigations with mammography, breast ultrasound and, if necessary, microhistological examination to exclude a cancer. Breast incidentalomas are infrequent but show malignant characteristics in a high percentage of cases.

AUTHOR CONTRIBUTIONS

Gambardella D, Leone F , Filippo R, Capomolla A, Stelitano S, Renne M, these authors are contributed equally to this work.

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CONFLICTS OF INTEREST

The authors declare that they have no competing interest.

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