

Increased F-FDG Uptake in Bilateral Gynecomastia Secondary to Feminizing Adrenal Tumor: A Rare Case Report and Review of Literature

Abstract

A 21 year old male who presented with painful enlargement of both the breasts and a hyperestrogenic state, was found to harbor a heterogeneous mass arising from the right adrenal on contrast enhanced Computed Tomography abdomen. The mass was hypermetabolic with no regional, nodal or distant metastases on Fluorine-18 Fluorodeoxyglucose Positron Emission Tomography /Computed Tomography examination. Notably, substantial tracer uptake was seen in bilateral gynecomastia. The patient underwent a right adrenalectomy with the histopathology report confirming adrenocortical carcinoma. This case demonstrates utility of FDG PET/CT in adrenocortical carcinoma. However, when interpreting FDG PET/CT as a staging tool in oncological male patients, one should consider gynecomastia as a possible cause for increased FDG uptake in the breast as it may lead to a false positive interpretation.

Keywords: 18F-FDG PET/CT, adrenocortical carcinoma, feminizing adrenal tumor, gynecomastia,

Hormonal evaluation, contrast enhanced CT abdomen in adrenal protocol and Fluorine-18 Fluorodeoxyglucose Positron Emission Tomography /Computed Tomography (18F-FDG PET/CT) are the investigations being performed for initial diagnosis and staging of adrenal tumors.^[1-3] Feminizing adrenal tumors are very rare, accounting for less than 2% of all the adrenal neoplasms and have poor prognosis.^[4]

A 21 year old male presented with painful gynecomastia, more on the right side for a 15 days duration. He denied any history of decreased libido and impotency to suggest hypogonadism. Clinical examination of the patient revealed bilateral enlarged breasts, right more than left (grade III in right breast and grade I in left breast) [Figure 1]. Ultrasonography of breast reported enlarged breasts with significant glandular tissue and fatty tissue, but no focal mass in the retroareolar region. Ultrasonography of scrotum reported normal sized testes. Hormonal assays revealed raised estradiol (47 pg/ml) and prolactin (18.03ng/ml), decreased Follicle Stimulating Hormone (0.21 mIU/ml) and total testosterone (129.91 ng/dl) levels. There was no history

of medications causing gynecomastia or past surgical history. There was a clinical suspicion of an adrenal tumor in view of symptoms of feminization such as gynecomastia, decreased FSH and testosterone, and elevated estradiol. Plasma free metanephrines (20.5 pg/ml) were within normal limits, excluding a pheochromocytoma. Contrast enhanced CT scan of the abdomen revealed a large heterogeneous mass [Figure 2] arising from the right adrenal gland, measuring 11.3 x 7.4 x 10.2cm with extensive neovascularity. Precontrast attenuation of the mass was 53 Hounsfield Unit (HU) with central areas of necrosis. Absolute washout of 54 % and relative washout of 21 % raised the possibility of malignant adrenal mass, likely to be adrenocortical carcinoma. Whole body F-18 Fluoro-2-deoxy-glucose PET/CT was done for initial staging and prognostication prior to surgery. It showed heterogeneously increased tracer uptake in the right adrenal mass with SUV max of 9.59, but no regional lymphadenopathy or distant metastasis. Tracer uptake was noted in the bilateral gynecomastia (right > left) with Standardized Uptake Value (SUV) max of 2.32. MIP (maximum intensity projection)

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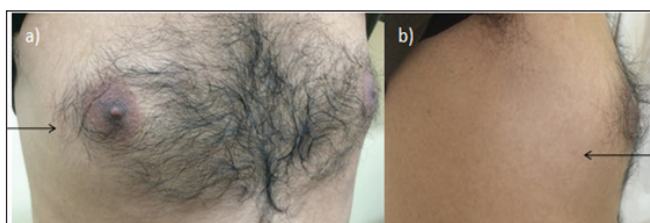


Figure 1: Bilateral enlarged breasts, right more than left in anterior (a) and lateral view (b) on clinical examination of the patient

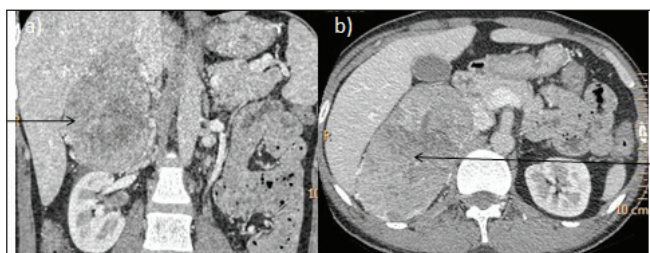


Figure 2: Contrast enhanced CT scan of abdomen showing a large heterogeneously enhancing mass with central necrosis with arrow pointing at the mass in the coronal (a) and axial images (b) arising from the right adrenal gland.

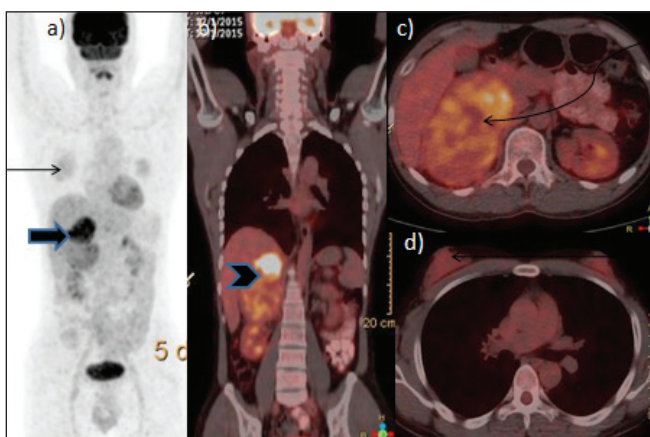


Figure 3: MIP (maximum intensity projection) image (a) demonstrates mild diffuse uptake in bilateral breasts, right greater than left (arrow on right) and the right adrenal tumor mass (broad arrow) [Figure (3a)]. [Figure (3b), (3c), (3d)] are fused PET/CT images. [Figure (3b)] shows the coronal section of the right adrenal mass (arrow head), [Figure (3c)] shows the axial sections with increased tracer uptake in the right adrenal mass (curved arrow) and [Figure (3d)] shows axial sections with increased FDG uptake in dense parenchyma of enlarged bilateral breasts suggestive of gynecomastia (arrow on right gynecomastia)

image showed tracer uptake in the right gynecomastia and the right adrenal tumor mass [Figure (3a)]. Fused PET/CT images [Figure (3b-d)] showed increased tracer uptake in the right adrenal mass and increased FDG uptake in dense parenchyma of enlarged bilateral breasts suggestive of gynecomastia (arrow on right gynecomastia). The patient underwent right side adrenalectomy with the histopathology report confirming adrenocortical carcinoma. In our patient, we could characterize the tumor by its increased glucose metabolism, stage it by showing the absence of regional or distant metastasis and also, report the functional aspect

of the tumor by showing increased F-18 FDG uptake in gynecomastia.

There have been earlier studies demonstrating the F-18 FDG uptake in gynecomastia caused by hepatocellular carcinoma [5,6] and Spironolactone-induced gynecomastia.[7] Glandular breast tissue may show moderate uptake of FDG.[8] Factors that affect FDG uptake of normal breast tissue are the mammographic density, age, and menstrual cycle.[9] Tissue density and hormonal status affect the uptake of FDG in the breast; dense breasts have significantly greater FDG uptake than fatty breasts.[10] In our case, the altered hormonal status with glandular and dense breast tissue is likely to have resulted in increased FDG uptake in the breast. A recent publication on the spectrum of the breast lesions with increased 18F-FDG uptake on PET/CT showed a case similar to ours among the causes for FDG uptake in gynecomastia.[9]

The role of F-18 FDG PET/CT in adrenal tumors, particularly, adrenocortical carcinoma has been explored in a few studies.[11-13] F-18 FDG PET/CT may provide a one stop shop, especially when used in combination with contrast enhanced CT, for evaluation of patients with suspected ACC. F-18 FDG PET may also help during evaluation of adrenal masses that are indeterminate by CT[14,15] This case demonstrates FDG uptake utility of FDG PET/CT in Adrenocortical carcinoma. Possibility of gynecomastia should be kept in mind as a cause of increased FDG uptake in male breast.

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Conflicts of interest

There are no conflicts of interest

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