Role of ^{18}F-Fluorodeoxyglucose Positron Emission Tomography–Contrast-Enhanced Computed Tomography in Detection of Early Recurrence with Peritoneal Disease in a Case of Adrenocortical Carcinoma

Abstract

Adrenocortical carcinoma (ACC) is an uncommon and highly aggressive malignancy with a poor prognosis. Common sites of metastasis are lung, liver, and lymph nodes. We present a case of ACC in a 54-year-old female with an early disease recurrence of unusual hypervascular peritoneal metastatic abdominal-pelvic deposits detected on ^{18}F-fluorodeoxyglucose positron emission tomography–contrast-enhanced computed tomography scan.

Keywords: *^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography, adrenocortical carcinoma, peritoneal metastasis*

Debdip Roy, Melvika Pereira, Divya Shivdasani, Natasha Singh, Shreya Dang, Rachita Rungta

Department of Nuclear Medicine and Molecular Imaging, P. D. Hinduja National Hospital and MRC, Mumbai, Maharashtra, India

A 54-year-old female presented with complaints of sudden-onset hypertension, hirsutism, and hot flushes. Initial diagnostic ultrasound and computed tomography (CT) workup detected a left adrenal mass lesion suggesting primary neoplasm. Staging ^{18}F-fluorodeoxyglucose positron emission tomography-CT (^{18}F-FDG PET-CT) scan [Figure 1] coronal PET, fused coronal PET-CT [Figure 1a and b], and corresponding fused transaxial images [Figure 1c-h] revealed an FDG-avid (SUVmax: 18.3) large heterogeneously enhancing lobulated left adrenal lesion with areas of necrosis. The lesion is abutting the left kidney and spleen, with tumor thrombus infiltrating the left suprarenal, left renal, left ovarian vein and adjacent inferior vena cava. The patient underwent left adrenalectomy, left nephrectomy, and caval thrombectomy. Histopathology revealed adrenocortical carcinoma (ACC), an uncommon epithelial malignancy of adrenal cortical cells with an unfavorable prognosis. ACC has a female predilection, with the left adrenal being commonly involved.[1,2] The patient was symptom free until just 5 months post surgery, and she presented with left flank pain. Triple-phase contrast-enhanced CT (CECT) abdomen-pelvis scan revealed multiple new-onset arterially hyperenhancing small nodular peritoneal deposits scattered in the abdomen-pelvis [Figure 2c, e, g, and i] which appeared isodense to abdominal aorta on subsequent phases. The abovementioned lesions demonstrated low-grade FDG avidity with SUVmax 3.8 as seen on FDG PET-CT scan coronal PET, fused PET-CT [Figure 2a and b], and corresponding fused transaxial images [Figure 2d, f, h, and j]. These scan findings appeared very unusual for ACC metastasis and demonstrated an appearance of splenosis (although the spleen was intact post surgery). Common sites of ACC metastasis include lung, liver, and lymph nodes, with peritoneal involvement being extremely rare.[3,4] Studies suggest that FDG PET-CT has a greater positive likelihood ratio than CT to identify liver and abdominal ACC recurrences and thus change in management strategy.[5-7] ACC being an aggressive neoplasm, metastatic disease is known to demonstrate higher FDG avidity, unlike that seen in our case. The patient underwent exploratory laparotomy with excision of multiple peritoneal nodules, and histopathology revealed metastatic ACC deposits. From this case, we learn

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Address for correspondence:
Dr. Debdip Roy, Department of Nuclear Medicine and Molecular Imaging, P. D. Hinduja National Hospital and MRC, Mumbai, Maharashtra, India.
E-mail: debdiproy9@gmail.com

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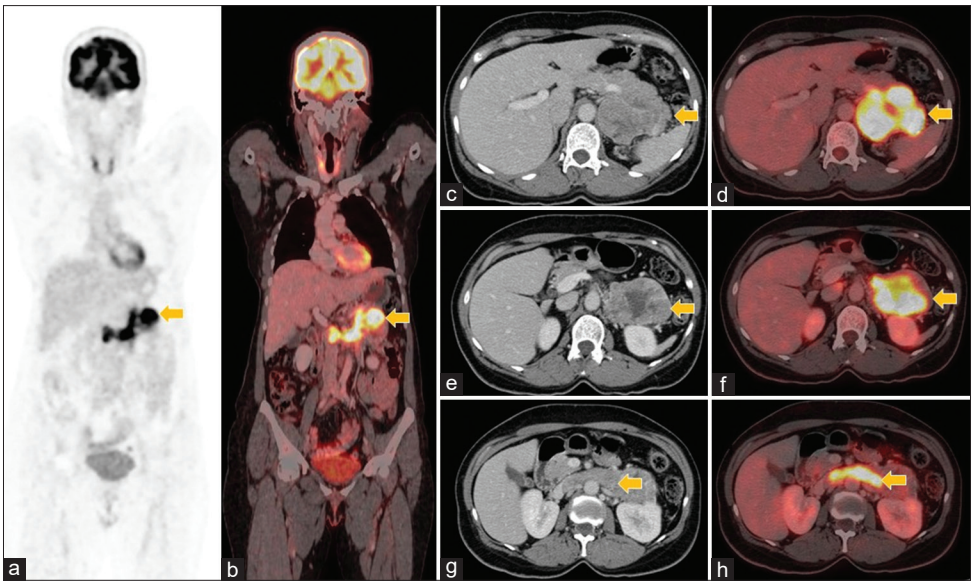

Figure 1: Staging ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography scan coronal positron emission tomography (a), fused coronal positron emission tomography–computed tomography (b), and corresponding transaxial images (c-h) showing fluorodeoxyglucose-avid large heterogeneously enhancing left adrenal lesion with tumor thrombus infiltrating the left renal vein and adjacent inferior vena cava

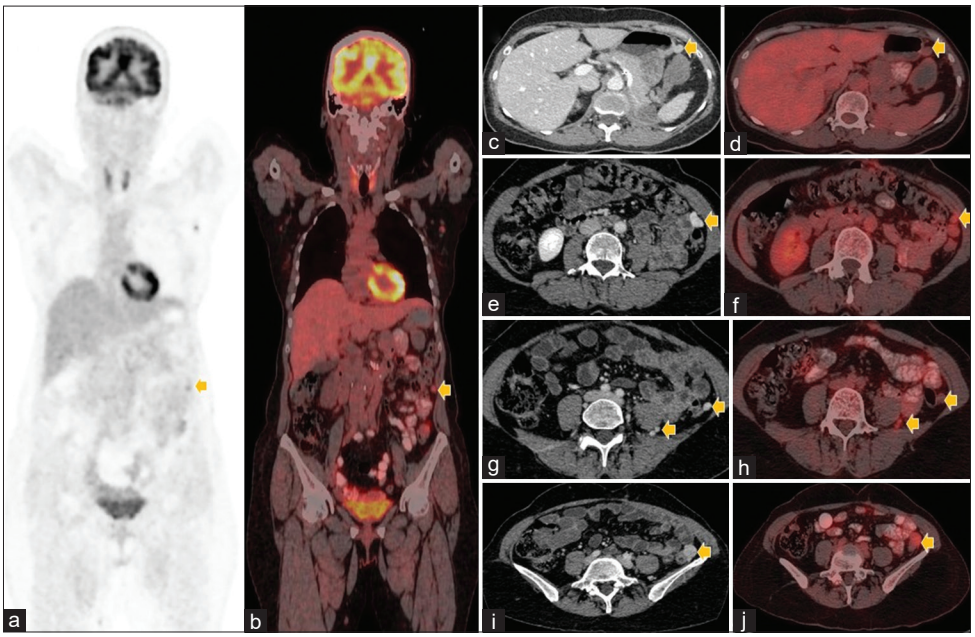

Figure 2: ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography scan coronal positron emission tomography (a), fused coronal positron emission tomography–computed tomography (b), contrast-enhanced computed tomography abdomen-pelvis (c, e, g, and i) and corresponding fused transaxial positron emission tomography–computed tomography images (d, f, h, and j) showing arterially hyperenhancing small nodular peritoneal deposits with low fluorodeoxyglucose avidity

that ACC metastatic recurrence can involve rarely only the peritoneum quite early post surgery, appearing as hypervascular nodules and presenting low FDG uptake. ^{18}F-FDG PET-CECT (triple-phase protocol) scan would be most appropriate to confidently detect the lesions.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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