Right Ventricle Metastasis from Carcinoma Rectum: Findings on ^{18}F-Fluorodeoxyglucose Positron Emission Tomography–Computed Tomography

Abstract

Rectal adenocarcinoma metastasizes most commonly to the lungs and liver. Metastasis to heart, although described in literature, is a very rare phenomenon. We describe the ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography (^{18}F-FDG PET-CT) findings of a 45-year-old male who was a biopsy-proven case of adenocarcinoma rectum. Apart from metastatic disease involving liver, lungs, bone marrow, and lymph nodes, metastasis to right ventricle was also seen on PET-CT scan.

Keywords: *Fluorodeoxyglucose, metastasis, positron emission tomography–computed tomography, rectum, right ventricle*

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A 45-year-old male, biopsy-proven case of adenocarcinoma rectum, was referred for ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography (^{18}F-FDG PET-CT) for metastatic workup of the disease. ^{18}F-FDG PET-CT projection images [Figure 1a] showed multiple focal areas of FDG uptake in the pelvis, abdomen, chest, and multiple vertebrae. Solid black arrow in Figure 1a showing the focal FDG uptake was found to be as a filling defect measuring approximately 10 mm × 9 mm in the apex of the right ventricle on axial CT image [Figure 1d solid white arrow]. FDG uptake (SUVmax – 15.5) was also seen in the corresponding transaxial fused PET-CT images [Figure 1e solid white arrow]. Figure 1b shows the primary soft-tissue mass in the rectum which shows increased FDG uptake in fused transaxial PET-CT image [Figure 1c]. Figure 1f and g represents axial CT and fused PET-CT images, respectively, showing multiple FDG avid hypodense lesions in the liver. Apart from the above-mentioned lesions, metastases to abdominopelvic lymph nodes, lungs, and bone marrow were also present. Confirmation of the presumed metastatic lesion in the right ventricle was not done by echocardiography or cardiac magnetic resonance imaging. Since there was disseminated metastatic disease in the body and morphology of the right ventricular lesion was unlikely of a tumor thrombus, this lesion was presumed to be metastatic.

Cardiac metastasis from rectal carcinoma is extremely rare, and the most common primary malignancy includes melanoma, mesothelioma, lung, and breast cancer.[1] Rarity of cardiac metastasis can be attributed to the high contractile strength of the heart, the metabolism of myocardium, the high velocity of the coronary blood flow, and the lymphatic network that drains from the heart.[2] Right atrium and ventricle remain the most common sites of metastasis in the heart in most of the cases suggestive of hematogenous spread.[2] Various case reports have described colorectal cardiac metastases as a direct extension into the atrium secondary to the pulmonary metastases.[3-6] Cardiac metastasis more often occurs as a part of the disseminated disease rather than as an isolated recurrence. Above-mentioned facts remain significant in our case as the metastasis is a part of widespread disseminated disease and occurred in the right ventricle. ^{18}F-FDG PET-CT has been able to first discover cardiac metastasis serendipitously in many primary malignancies which were later confirmed on other imaging modality.[7-10]

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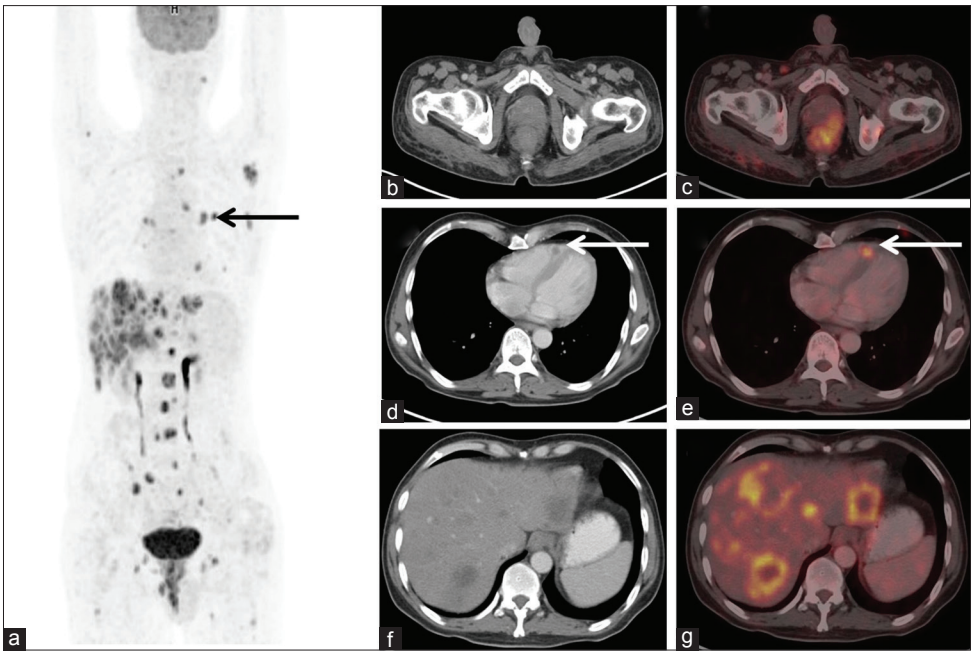

Figure 1: (a) 18F-fluorodeoxyglucose positron emission tomography–computed tomography projection images showing multiple focal areas of fluorodeoxyglucose uptake in the pelvis, abdomen, chest, and multiple vertebrae. (b and c) Axial computed tomography image showing rectal mass that shows fluorodeoxyglucose uptake in the fused transaxial positron emission tomography–computed tomography images. (d and e) Filling defect in the right ventricle apex showing fluorodeoxyglucose uptake in fused transaxial positron emission tomography–computed tomography images. (f and g) Multiple hypodense lesions in both lobes of liver showing increased fluorodeoxyglucose uptake

The authors through this case want to reiterate the fact that ^{18}F-FDG PET-CT remains a novel modality for identifying metastasis in unusual sites which would have been difficult in conventional imaging modalities.

Declaration of patient consent

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

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Conflicts of interest

There are no conflicts of interest.

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