

Cutaneous Metastasis from Visceral Organs: ¹⁸F-Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography Scan Aiding in Localizing Primary Site

Abstract

Skin metastases are rare from systemic malignancy, and incidence reported is between 0.7% and 9% in various malignancies and usually occur in advanced stage. Here, we report three cases, one each of carcinoma esophagus, carcinoma breast, and carcinoma lung, where patients presented with metastatic cutaneous lesions and positron-emission tomography-computed tomography (PET-CT) scan whole body helped in localizing the primary site. Whole-body fluorodeoxyglucose PET-CT scan helps in scanning whole body at once and detect occult primary and metastatic sites.

Keywords: ¹⁸F-fluorodeoxyglucose positron-emission tomography-computed tomography scan, carcinoma breast, carcinoma esophagus, carcinoma lung, skin metastasis

Introduction

Cutaneous metastases are particularly seen with breast cancer, followed by lung, colorectal, ovarian, renal cell carcinoma, and gastrointestinal tumors. They are a sign of poor prognosis and end-stage disease. It usually results from lymphatic embolization, hematogenous or contiguous spread, and also by iatrogenic implantation of malignant cells following surgical procedures. The presenting complaint in breast cancer patients is usually breast lump; however, in late stages, cutaneous lesions have been seen in few cases. Carcinoma esophagus is the sixth-most common cause of mortality worldwide. Patients usually present with dysphagia as the main symptom. Esophageal carcinoma most commonly spreads to the lymph nodes, lung, liver, and bones. However, in our case, cutaneous lesions were the presenting complaint. Lung carcinoma is the most common cause of cancer death worldwide. The most common sites of metastasis from lung cancer are the bones, adrenal gland, and brain. Skin is rarely affected and is rarely the initial presenting complaint. Whole-body fluorodeoxyglucose positron-emission tomography-computed tomography (FDG PET-CT) offers high lesion to background contrast and helps in

scanning the whole body at once, to localize occult primary and detect metastatic lesions.

Case Examples

Case 1

A 58-year-old male presented with multiple skin lesions and weight loss. The skin lesions were discrete and confluent, erythematous papules, and plaques were distributed over the scalp, neck, abdomen, and pelvic regions. Biopsy from the skin lesion revealed metastatic carcinoma. Whole-body FDG-PET-CT scan performed to localize the primary site shows multiple areas of abnormal increased FDG uptake spread throughout the body [Figure 1a]. The transaxial fused PET-CT and CT images localized increase FDG uptake in mural thickening with mass formation in the lower end of the esophagus [Figure 1b and c; arrowhead] causing luminal compromise and cutaneous lesions in the abdomen and pelvis [Figure 1d-g; arrowhead]. The PET-CT findings were suggestive of esophageal mural thickening as primary site carcinoma with multiple metastases which were later proved on histopathological examination [Figure 2].

Case 2

A 42-year-old female presented with multiple skin lesions, weight loss, and generalized

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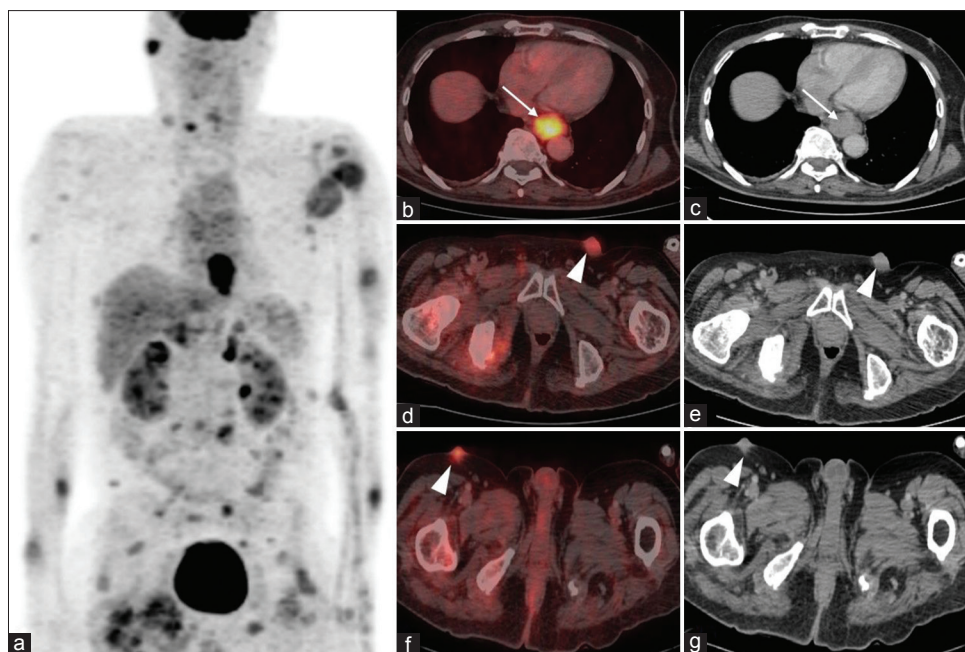


Figure 1: MIP image (a) showing multiple lesions of abnormal fluorodeoxyglucose uptake which on transaxial fused positron-emission tomography-computed tomography and computed tomography images (b and c) localized to asymmetrical mural thickening with the mass formation in the lower end of the esophagus (arrow). Additionally increased fluorodeoxyglucose uptake was also noted in multiple cutaneous lesions (arrow head; d-g) suggestive of metastatic disease

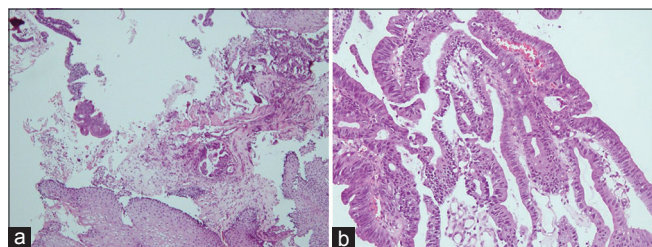


Figure 2: Histopathological images show fragments of stratified squamous epithelium (esophagus) with a neoplasm (a), cells of which are arranged in gland formation suggestive of adenocarcinoma (b). The neoplastic cells show moderately pleomorphic hyperchromatic nuclei with moderate amount of cytoplasm

body pain. She had erythematous papules over the scalp and abdomen. Whole-body FDG-PET CT scan was performed for further evaluation. The maximum intensity projection (MIP) image shows multiple areas of abnormal increased FDG uptake spread throughout the body [Figure 3a]. The PET-CT and CT images localized increase FDG uptake in coalescent ulcerative soft-tissue mass lesion in the left breast [Figure 3b and c; arrowhead] and cutaneous lesions in the abdomen and scalp [Figure 3d-g; arrowhead]. The PET-CT findings were suggestive of soft-tissue mass in the left breast, as a primary site with multiple metastases. On retrospective analysis, the patient was found to have lump in the left breast. Biopsy from the left breast and cutaneous lesions confirmed carcinoma left breast with cutaneous metastasis.

Case 3

A 70-year-old male presented with a history of the scalp and nasal swelling and plaque skin lesions. Biopsy done from

nasal swelling was suggestive of metastatic squamous cell carcinoma. Thus, the patient was referred for whole-body FDG PET-CT scan for staging and to detect occult primary. The MIP image shows multiple areas of abnormal increased FDG uptake [Figure 4a]. The PET-CT and CT images localized increase FDG uptake in heterogeneously enhancing soft-tissue mass lesion in the upper lobe of the left lung [Figure 4b and c; arrowhead] and cutaneous lesions in the nose and pelvis [Figure 4d-g; arrowhead]. The PET-CT findings were suggestive of the left lung lesion (primary site) with multiple metastases.

Discussion

Skin metastases are an uncommon phenomenon accounting for frequency ranging from 0.7% to 9% in all abdominal malignancies and usually present after the sixth decade of life.^[1] Excluding melanoma, breast cancer is the most common cancer to metastasize to the skin, in women, with the incidence of approximately 23.9%.^[2] The percentage of patients with lung cancer who develop cutaneous metastases ranges from 1% to 12%.^[3] The scalp is a favorite site of cutaneous metastasis of lung cancer, representing 54% of all cutaneous metastases of this cancer. The reason for higher scalp metastasis may be rich blood flow.^[4] It was also found that cancer of the upper lobes of the lungs has a greater tendency to metastasizing in the skin, as seen in our patient.^[5] Cutaneous metastasis from esophageal malignancy is rare, affect <1% of cases, and usually occurs in the advanced stage of the disease.^[6] The majority of cutaneous metastasis is diagnosed only after primary cancer; it is rarely the tell-tale sign of an unknown malignancy.^[7]

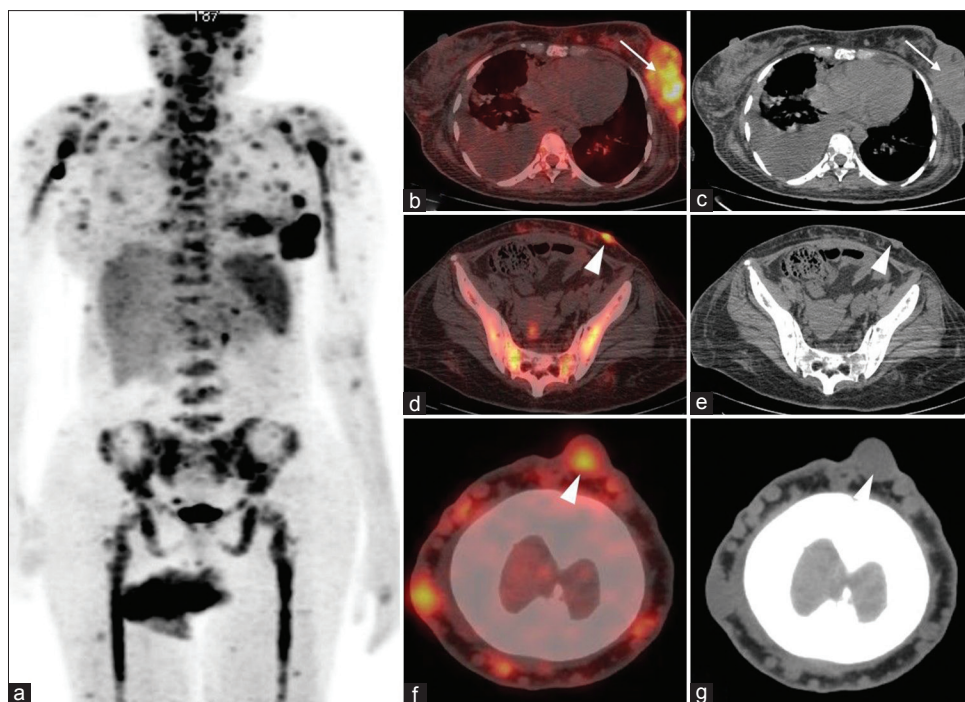


Figure 3: Whole-body fluorodeoxyglucose positron-emission tomography-computed tomography (a) shows multiple areas of increased tracer uptake. Transaxial fused positron-emission tomography-computed tomography and computed tomography images localized increase fluorodeoxyglucose uptake in the left breast lesion with mass formation (arrow; b and c). The transaxial fused positron-emission tomography-computed tomography and computed tomography images also revealed increase fluorodeoxyglucose uptake in cutaneous lesions in the abdomen and scalp (arrowhead; d-g)

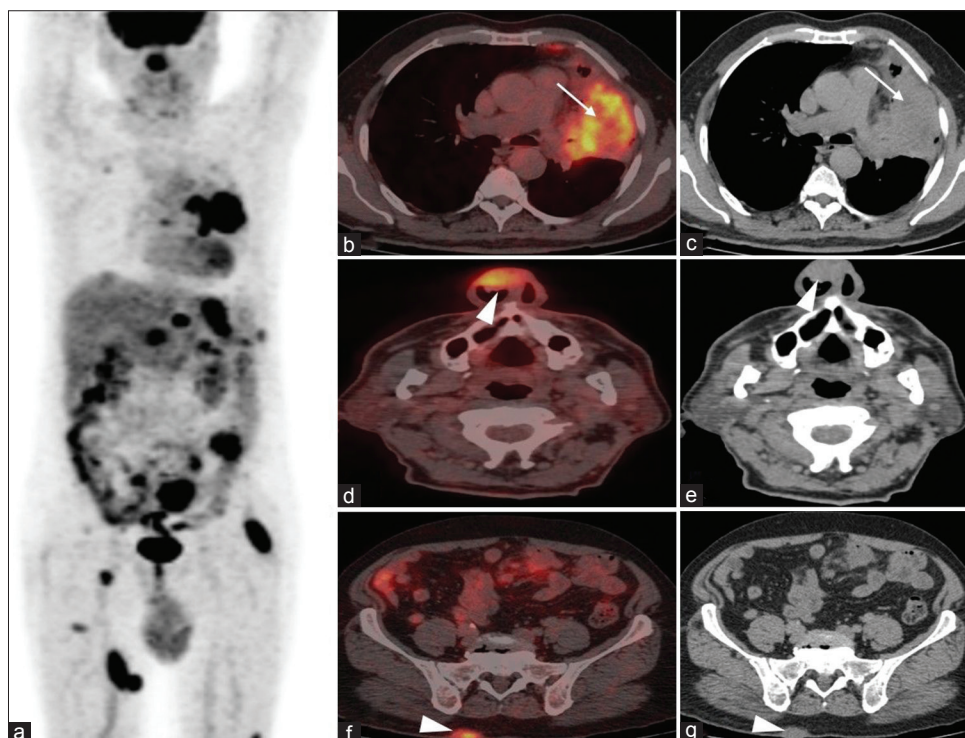


Figure 4: Fluorodeoxyglucose positron-emission tomography-computed tomography shows a large area of abnormal tracer uptake in the left chest region (a) which on transaxial fused positron-emission tomography-computed tomography and computed tomography images localized to a large lobulated fibro consolidative mass in the left lung (arrow; b and c). The transaxial fused positron-emission tomography-computed tomography and computed tomography images also revealed increase fluorodeoxyglucose uptake in cutaneous lesions in the nose (arrowhead; d and e) and in the lower abdomen (arrowhead; f and g) corresponding to the earlier diagnosed metastatic site

In some rare cases, cutaneous metastasis can occur even before the symptom of the primary site,^[8] as seen in our

patients. Cutaneous metastasis can be seen in both variants squamous cell carcinoma and adenocarcinoma, although the

frequency is relatively more with squamous cell carcinoma in case of carcinoma esophagus.^[9]

Several studies have conferred the importance of PET-CT scan in detecting sites of unexpected metastasis.^[10,11] FDG-PET has been shown to have a higher sensitivity for the detection of metastatic disease compared to CT in combination with endoscopic ultrasonography (EUS). Flamen *et al.* reported both higher accuracy (82% vs. 64%) and sensitivity (74% vs. 47%) for FDG-PET when compared to CT and EUS for the detection of distant disease.^[12,13] Patients with skin metastatic disease usually have significantly poorer prognosis with reported survival rates of <1 year after the identification of metastatic lesions. The treatment is usually aimed to palliation through possible resection with chemotherapy and radiotherapy.^[14]

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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Nil.

Conflicts of interest

There are no conflicts of interest.

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