18F-Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography in the Evaluation of Anorectal Malignant Melanoma: A Case Series

Abstract

Melanomas are the malignancies that can affect any anatomic region where melanocytes exist (such as the epidermis, eyes, nasal cavity, and anus). Anorectal melanoma is a rare mucosal melanocytic malignancy, comprising 0.8% of all anorectal malignancies. Here, we report a case series of three patients of anorectal melanoma and role of positron emission tomography/computed tomography in diagnosis and follow-up to evaluate the local recurrence and distant metastases. Of three patients, two presented with rectal bleeding and one with obstruction. One patient had recurrence after 10 months, other after 24 months, and third remained disease free post surgery till 9 months.

Keywords: *Abdominoperineal resection, anorectal malignant melanoma, fluorodeoxyglucose positron emission tomography/computed tomography scan*

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Introduction

Primary anorectal malignant melanoma (AMM) is a rare and aggressive tumor, accounting for a very few of all reported colorectal cancers. The most common presenting symptom of these patients is bleeding. Conventional treatment modality is a surgery that involves abdominoperineal resection (APR) or extensive surgical excision. Positron emission tomography/computed tomography (PET/CT) is an accepted imaging method for the determination of local lymph nodes, distant metastasis, and in follow-up of these patients. Our case series highlights the importance of 18F-fluorodeoxyglucose (FDG) PET/CT scan in staging of these patients and in follow-up to evaluate the recurrence.

Case Reports

Case 1

A 61-year-old male presented with rectal bleeding for 3–4 months. Rectal digital examination and proctoscopy revealed a mass in the anorectal region, and in view of suspicion of malignancy, the patient was referred for whole-body FDG PET/CT scan. The staging of PET/CT scan [Figure 1a-d] showed an intensely FDG-avid intraluminal mass in the anorectum with FDG-avid regional lymph nodes. Subsequently, surgery was planned, and APR with colostomy was performed, and histopathology report [Figure 2a] confirmed rectal melanoma. Postsurgery, the patient received concurrent chemotherapy and radiotherapy. Follow-up PET/CT scan after 6 months [Figure 1e-h] revealed the absence of FDG-avid visible mitotic disease. PET/CT scan [Figure 1i-l] done 10 months after staging was suggestive of recurrence with FDG-avid metastatic lesions in the liver, abdominal deposits, and FDG-avid skeletal lesion.

Case 2

A 68-year-old female presented with symptoms of intestinal obstruction. Post evaluation, anterior resection and diversion colostomy surgery were performed, and the resected specimen was sent for histopathological examination. On histopathology [Figure 2b], it was reported as rectal malignant melanoma. Subsequently, the patient was sent for PET/CT scan to rule out distant disease. Initial scan [Figure 3a-d] showed postoperative changes in the pelvis and postcolostomy status. Follow-up scan after three cycles of chemotherapy and after 3 months of initial scan showed postoperative changes and no evidence of any FDG-avid visible disease. However, PET/CT scan performed 24 months after the

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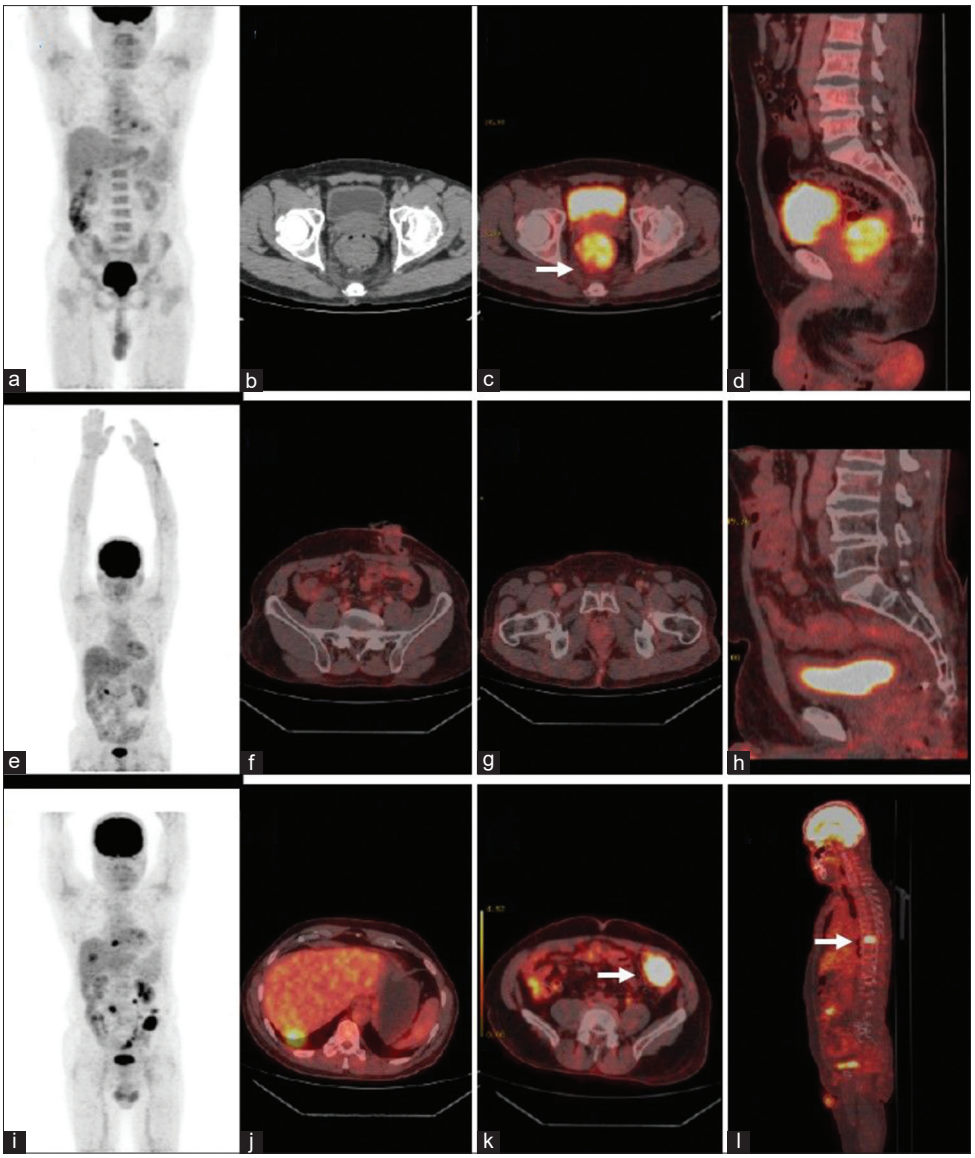

Figure 1: Maximal intensity projection (a) of staging whole-body fluorodeoxyglucose positron emission tomography/computed tomography scan. Axial computed tomography, fused positron emission tomography/computed tomography, and sagittal-fused positron emission tomography/computed tomography (b-d) images showing fluorodeoxyglucose-avid intraluminal mass lesion in anorectum region. MIP (e) of follow-up positron emission tomography/computed tomography scan after 6 months. Fused positron emission tomography/computed tomography axial and sagittal views (e-h) suggestive of an absence of fluorodeoxyglucose-avid visible mitotic disease. Maximal intensity projection (i) of positron emission tomography/computed tomography scan done 10 months after staging. Fused positron emission tomography/computed tomography axial and sagittal images (j-l) suggestive of recurrence with fluorodeoxyglucose-avid metastatic lesions in the liver, abdominal deposits, and fluorodeoxyglucose-avid skeletal lesion

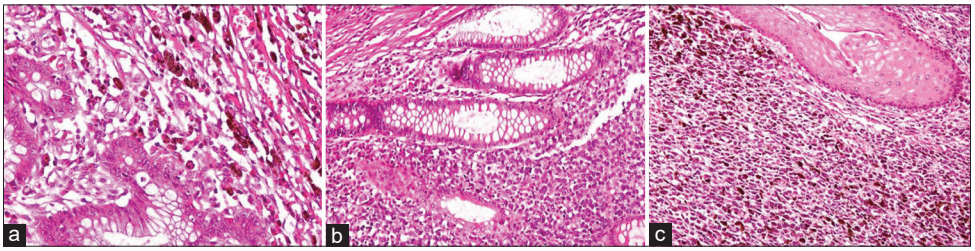

Figure 2: Histopathology images. Case 1 (a) rectal mucosa infiltrated by malignant cells in a diffuse manner (H and E, ×400). Case 2 (b) rectal mucosa infiltrated by malignant cells in a diffuse manner. Many of the cells have melanin pigment in their cytoplasm (H and E, ×200). Case 3 (c) anal mucosa infiltrated by malignant cells in a diffuse manner. Many of the cells have melanin pigment in their cytoplasm (H and E, 200). All the tumor cells were positive for S-100, HMB45, and Melan A

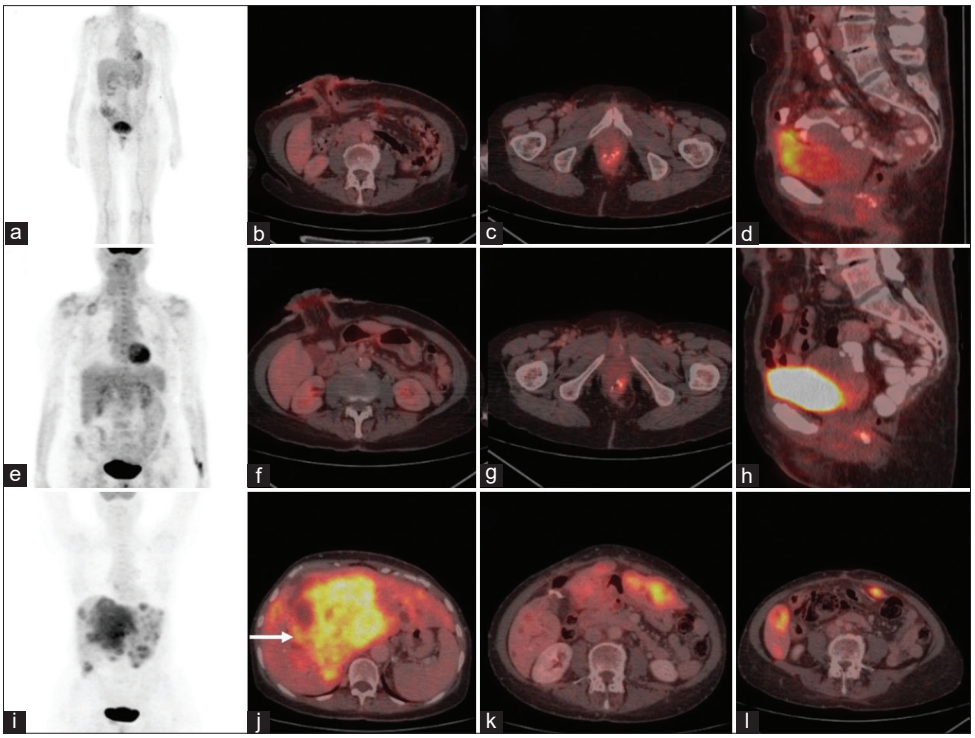

Figure 3: Maximal intensity projection (a) of staging whole-body fluorodeoxyglucose positron emission tomography/computed tomography scan. Axial fused positron emission tomography/computed tomography and sagittal images (b-d) showing postoperative changes in the pelvis and postcolostomy status. Maximal intensity projection (e) of follow-up positron emission tomography/computed tomography scan after 3 months. Fused positron emission tomography/computed tomography axial and sagittal images (f-h) showing postoperative changes in the pelvis and postcolostomy status. Maximal intensity projection (i) of positron emission tomography/computed tomography scan done 24 months after staging. Fused positron emission tomography/computed tomography images (j-l) showing multiple fluorodeoxyglucose-avid lesions involving liver suggestive of recurrence

initial scan showed multiple FDG-avid lesions involving the liver suggestive of recurrence.

Case 3

A 41-year-old male presented with rectal bleeding for 4–5 months. A rectal mass was palpated on examination. The patient was sent for FDG PET/CT scan for initial evaluation. The whole-body FDG PET/CT scan [Figure 4a-d] showed a FDG-avid polypoidal intraluminal mass involving the anorectal region with FDG-avid regional lymph nodes. APR was performed, and histopathology report [Figure 2c] was suggestive of rectal melanoma. Postsurgery and radiotherapy, follow-up PET/CT scan [Figure 4e-h] done after 9 months of the initial scan was suggestive of an absence of FDG-avid visible disease.

Discussion

Primary AMM is an extremely rare and aggressive malignancy that is thought to arise from melanocytes in the mucosa around the anorectal junction. It is associated with a relatively poor prognosis, and surgical resection is the only curative treatment option. The anorectum is the third most common location of malignant melanoma after the skin and retina. These are infrequent cancers accounting for 0.05%–2% of all colorectal cancers and <1% of all melanomas.[1] The prognosis is poor, with overall survival rate of <20% in 5 years with a median survival period of 12.2–22 months.[2] It was first reported by Moore in 1857.[3] It is mostly seen in the sixth decade, with a female predominance.[4] Rectal bleeding is the most common symptom. Hemorrhoids, polyps, and other malignancies are the most common differential diagnoses.[5] They are often associated with the involvement of inguinal lymph nodes, distant metastasis, and synchronous and metachronous adenocarcinomas. The most common sites for metastases are inguinal lymph nodes, para-aortic lymph nodes, liver, and lung. The incidence rates for locoregional lymph node metastases on initial presentation are almost 60%. The mesorectal lymph nodes are involved in preference to inguinal lymph nodes in contrast to squamous cell carcinoma of the anus. At the time of diagnosis, distant metastases are identified in 26%–38% of patients.[6] Surgical resection, APR with or without bilateral inguinal lymphadenectomy, or wide local excision remain the mainstay of treatment. Chemotherapy and radiotherapy have no benefit. Age >60 years and lesions >1 cm in diameter have been identified as prognostic factors.

18F-FDG PET/CT has the ability to identify foci of abnormally high metabolism. It is a good imaging method for the determination of distant metastasis and lymphatic spread. However, FDG uptake in colorectal and anal areas is nonspecific, and it can be seen either in the sites of inflammatory, malignant, or premalignant. Moreover, hemorrhoids can also be one possible cause of focal high

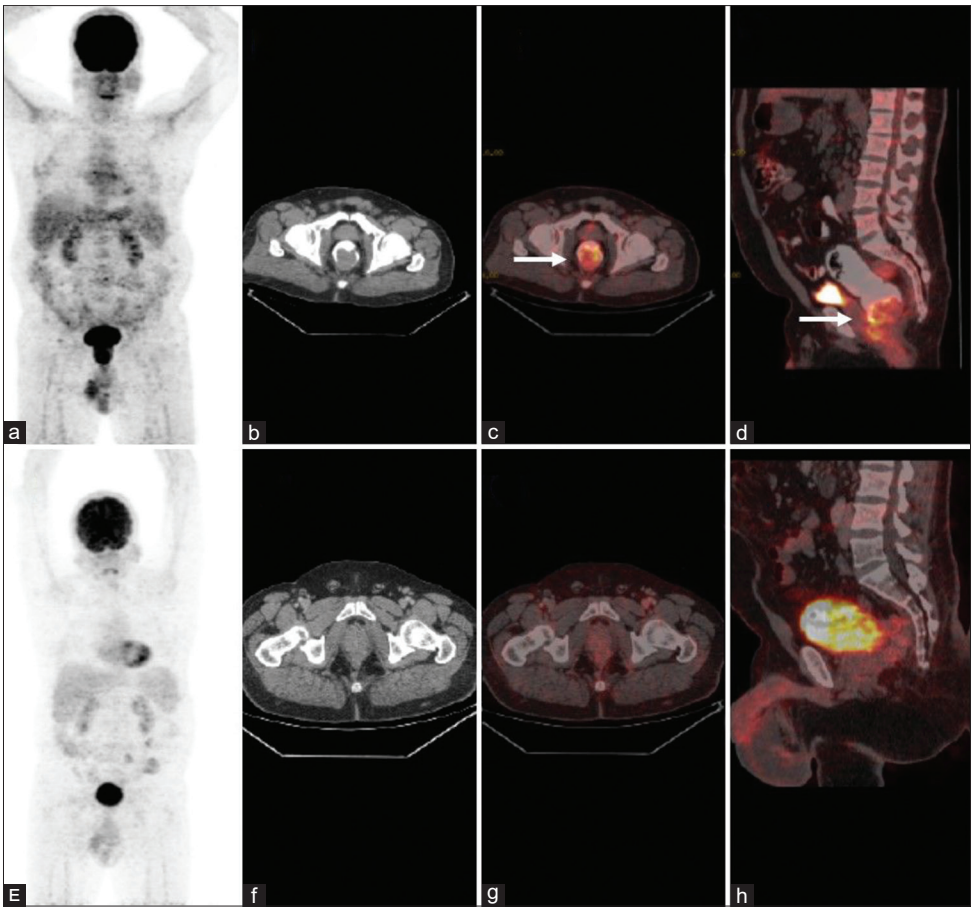

Figure 4: Maximal intensity projection (a) of staging whole-body fluorodeoxyglucose positron emission tomography/computed tomography scan. Axial computed tomography, fused positron emission tomography/computed tomography, and sagittal-fused positron emission tomography/computed tomography (b-d) images showing fluorodeoxyglucose-avid polypoidal intraluminal mass involving the anorectal region with fluorodeoxyglucose-avid regional lymph nodes. Maximal intensity projection (e) of follow-up positron emission tomography/computed tomography scan after 9 months. Axial computed tomography, fused positron emission tomography/computed tomography, and sagittal views (f-h) suggestive of an absence of fluorodeoxyglucose-avid visible mitotic disease

FDG uptake in the rectum. The correct diagnosis of the lesion is revealed only by histopathology examination. PET/CT is recommended in staging and response assessment of metastatic melanoma. Malignant cells have greater FDG avidity than adjacent normal tissues because of their higher metabolic rate. Therefore, PET/CT allows the evaluation of the site of metastasis and may help in staging disease and the therapy.

An article by Falch *et al*. concluded that 18F-FDG PET/CT is superior to contrast-enhanced CT in staging of ARMM. Lymph nodes and distant metastasis can be missed by CT scan and can be well detected by PET/CT[7].

PET/CT is the most widely adopted modality in visualizing perirectal lymph nodes and screening for distant metastasis to evaluate the patient status for the options of curative surgery.

Few case reports have been published previously about anorectal melanoma and the role of PET/CT scan.[8-14] As seen in our cases first and second, during recurrence, metastatic lesions were seen in the liver, skeleton, or soft-tissue deposits in the abdomen; thus, whole-body PET/CT scan can help in detecting sites of distant metastases, which might be missed on regional conventional imaging. Although it is difficult to make a differentiation of anorectal melanoma from other malignancies and inflammatory conditions on the basis of FDG PET/CT images alone, our case highlights the role of staging FDG PET/CT in identifying regional lymph node metastases and distant involvement, which is related to the prognosis of this disease and in follow-up of patients to identify recurrence.

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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