Case Report

Variable features of ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography scan in anorectal malignant melanoma: Case reports and review articles

ABSTRACT

Anorectal malignant melanoma (ARM) is a rare variant of malignant melanoma and even more rare among all anorectal cancers. ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography–computed tomography (CT) scan is valuable in staging, restaging, treatment response evaluation, and long-term follow-up of malignant melanoma. Here, reporting two cases of anorectal melanoma with a variety of FDG uptake pattern and CT-based features and reviewed a few articles to evaluate the pattern of FDG uptake.

Keywords: Anorectal melanoma, pattern of fluorodeoxyglucose uptake, positron emission tomography–computed tomography

INTRODUCTION

Malignant melanoma is tumor of melanocytes which are present in the skin, mucosa, and ocular layer. Non-cutaneous malignant melanomas are rare including ocular – eyelid, uvula, mucosa – hard palate, sinonasal, oral cavity, gastrointestinal, and genitourinary tract, etc., Usually, malignant melanoma is high-grade fluorodeoxyglucose (FDG) avid and contrast hyper-enhancing tumor, but on the contrary, here presented two cases with different FDG uptake and computed tomography (CT) morphological features which could be misleading in positron emission tomography (PET)–CT-based diagnosis/interpretation.

CASE REPORTS

Case 1

A 59-year-old male patient had complained of intermittent per rectal bleeding for 2 months and weight loss 2–3 kg. Video-colonoscopy found eccentric growth in the anal canal and serum carcinoembryonic antigen (S.CEA) level was normal. Biopsy with immunohistochemistry was suggested melanoma. The patient was referred for fluorodeoxyglucose (FDG) PET-contrast-enhanced CT (CECT) scan. The finding was predominantly low-grade FDG avid heterogeneous mild-to-moderately enhancing endoluminal growth in the anal canal, anorectal junction, and lower rectum [Figure 1]. A non–FDG-avid tiny left mesorectal lymph node was found [Figure 2]. The patient was operated, and the histopathology report suggested Mucosal Amelanotic Melanoma with one metastatic lymph node.

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Case 2

A 65-year-old male patient had complained of upper abdominal pain and weight loss. USG found multiple liver lesions and guided biopsy diagnosed as metastatic melanoma. The patient had no cutaneous lesion and hence, referred for PET-CT scan to identify the primary lesion. Whole-body ^{18}F-FDG PET-CECT scan done and found high-grade FDG avid polypoidal ulcerated contrast hyper-enhancing lesion in the lower rectum, anorectal junction, and extends in the upper part of the anal canal with metastatic liver and lung lesions [Figures 3-5].

Scans were done on SIEMENS Biograph TruePoint 16-slice PET-CT scanner (SIEMENS AG, Wittelsbacherplatz 2, DE-80333 Muenchen, Germany) after 60 min of 370 MBq ^{18}F-FDG intravenous injections.

DISCUSSION

Anorectal mucosal melanoma is rare among all malignant melanomas (about 1.3%) and 16.5% of mucosal melanomas and also rare among all anorectal malignancies associated with poor prognosis. In India, it is more prevalent in males, whereas more prevalent in females in other countries.

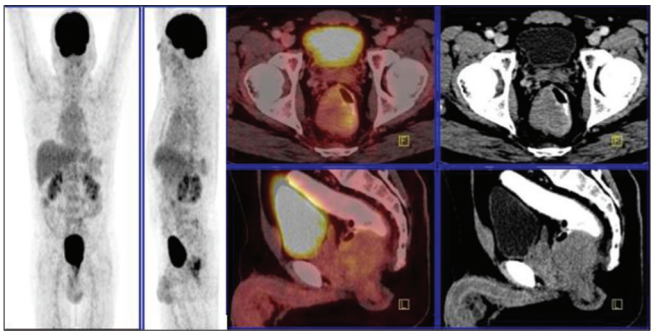

Figure 1: Maximum intensity projection images, axial (upper) and sagittal (lower) fluorodeoxyglucose positron emission tomography–computed tomography fusion images show low-grade fluorodeoxyglucose avid heterogeneously enhancing endo-luminal growth in the anal canal, anorectal junction, and lower rectum

Because of its lower incidence rate and confusing histological features, it is often misdiagnosed as lymphoma, carcinoma, or sarcoma.[1,2] Patients present with local symptoms such as lower abdominal pain, per rectal bleeding, or bowel alteration. Up to 67% of cases initially present with metastasis at the time of diagnosis.[3] Melanoma metastasizes hematogenous or lymphogenous route to locoregional lymph nodes, liver, lung, bone, or brain.

Falch *et al*., reviewed novel staging method for anorectal melanoma (ARM) and observed FDG PET-CT scan is a useful tool for staging and treatment planning.[4]

FDG PET-CT scan in recommended imaging tool in Stage III and IV as provides additional impactful information over CT scan. FDG PET-CT scan is superior to CT scan for the diagnosis of nodal involvement and distant metastasis.[5]

ARM usually appears as polypoidal or ulcerated contrast hyperenhancing lesion with high-to-moderate grade FDG avidity. Few variants of ARM are amelanotic, epithelioid, spindle cell, lymphoma-like, and pleomorphic type.[6] However, as of now, the management and prognosis of malignant melanoma are not dependent on its subvariant.

Very few articles had been published related to ARM and PET scan specifically for a direct intent of evaluating the pattern of

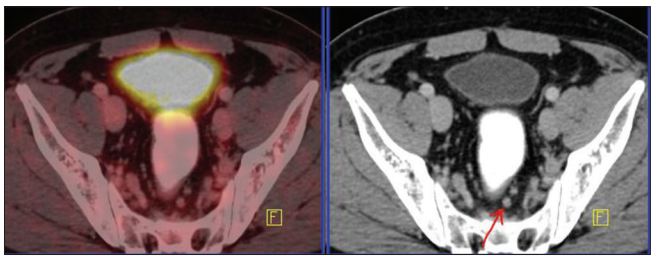

Figure 2: Axial fluorodeoxyglucose positron emission tomography–computed tomography fusion images show nonfluorodeoxyglucose avid enhancing mesorectal metastatic lymph node

Table 1: Pattern of fluorodeoxyglucose uptake in anorectal melanoma mentioned in various articles

Reference of author	Year of publication	The pattern of FDG uptake in the primary anorectal lesion	Presence of distance metastasis except locoregional metastatic nodes
Tomioka *et al*.[8]	2012	High grade (SUV - 19.2)	Liver
Tai *et al*.[9]	2007	High grade (SUV - 5.9)	Bone
Murphy *et al*.[10]	2014	High grade (SUV - NA)	Liver and bone
Bulut *et al*.[7]	2017	Low-to-moderate grade (SUV - NA)	No
Li and Qin[11]	2014	High-grade FDG avid	Lungs, bones, liver
Kothonidis *et al*.[12]	2017	High grade (SUV_{max} - 35.1)	No
Sugano *et al*.[13]	2017	High grade	Liver and brain
Case 1		Low- to-moderate grade (SUV_{max} - 3.7)	No
Case 2		High grade (SUV_{max} - 14.2)	Liver and lung

FDG: Fluorodeoxyglucose; SUV: Standardized uptake value; SUV_{max}: Maximum SUV; NA: Not available

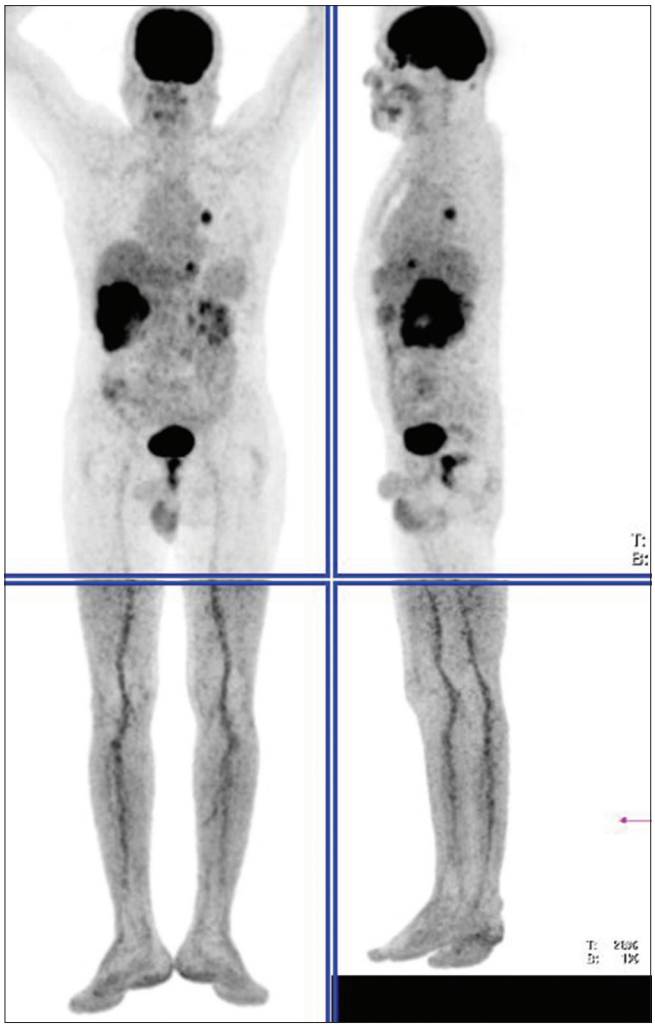

Figure 3: Maximum intensity projection images of case 2 show high-grade fluorodeoxyglucose avid primary lesion in the lower rectum with metastatic liver and lung lesions

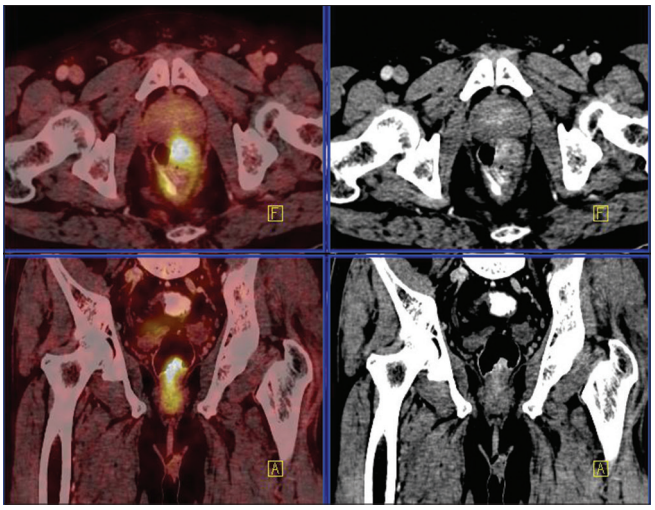

Figure 4: Fluorodeoxyglucose positron emission tomography–computed tomography fusion axial and coronal images show high-grade fluorodeoxyglucose avid ulcerated contrast hyper-enhancing lesion in the lower rectum, anorectal junction, and extends in the upper part of the anal canal

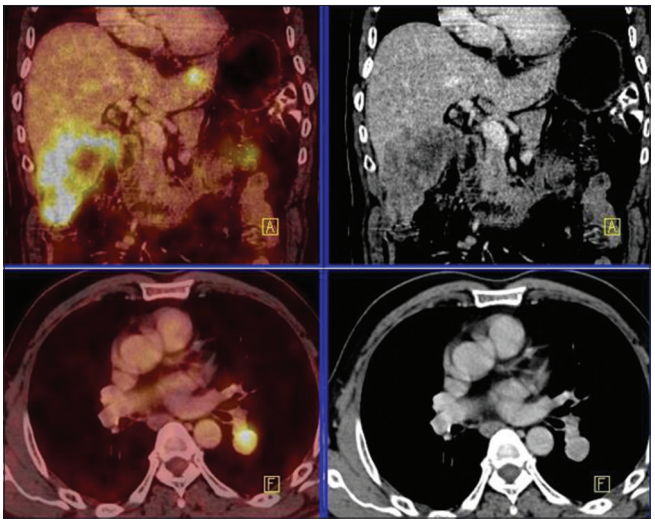

Figure 5: Fluorodeoxyglucose positron emission tomography–computed tomography fusion axial and coronal images show high-grade fluorodeoxyglucose avid metastatic liver and lung lesions

FDG uptake and other PET-CECT-related features and hence have to gone through articles statements, legends and given PET or PET-CT fusion images visual assessments to evaluate the pattern of FDG uptake in ARM cases. After reviewing such articles, it has been found that most of the cases had high-grade FDG avid primary ARM; however, only one case[7] had low-to-moderate grade FDG-avid lesion based on given images [Table 1].

Here, in the mentioned first case, the lesion was well-defined endoluminal growth causing luminal narrowing without extramural extension with low-grade FDG avidity and minimal enhancement. Such a less-known variant of low-grade FDG avid and low contrast-enhancing well-circumscribed lesion could be missed as low-grade non-Hodgkin's lymphoma or mucinous adenocarcinoma. However, the final histopathology report mentioned as mucosal malignant melanoma. There was no distant metastatic lesion, and this is a possible similarity of low-grade FDG-avid lesions [Table 1].

In the above-mentioned second case, the lesion was an endoluminal growth with ulceration and showed high contrast-enhancement and FDG avidity. There were FDG-avid liver and lung metastatic lesions also. Based on cases of review of articles and here reported two cases as mentioned in Table 1, it has been noted that all cases of ARM with distant metastases were high-grade FDG avid. This might raise possible positive correlation of FDG avidity and the presence of distant metastasis, and thus, the intensity of FDG uptake may give indirect biological insight into disease aggressiveness.

CONCLUSION

In general, melanomas are considered as high-grade FDG avid malignancy, but here we reported two cases of anorectal malignant melanoma with two different FDG PET-CECT scan patterns in terms of variety of FDG uptake, contrast enhancement, morphological appearance-like will defined or ulcerated lesion and the presence of metastatic lesions and might raise possibilities of (a) correlation of imaging features with aggressiveness of disease in terms of nodal and distant metastasis and (b) correlation of imaging features with histological subvariant of melanoma which can be assessed on larger scale and multicentric studies.

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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