Analytical Report

Malignant amelanotic melanoma - A diagnostic surprise: Flurodeoxyglocose positron emission tomography-Computed tomography and immunohistochemistry clinch the 'final diagnosis'

ABSTRACT

Amelanotic melanoma is a rare malignancy and the prognosis is usually poorer than that of pigmented melanomas, because of delay in establishing the correct diagnosis, and in treatment initiation. In our case report, we present a the Flurodeoxyglocose Positron Emission Tomography-Computed Tomography (FDG PET/CT) findings of a patient suffering from malignant amelanotic melanoma and its histopathological confirmation and immunohistochemistry (IHC) correlation In the described case, amelanotic melanoma masqueraded as adenocarcinoma of the rectum in the pathology as well the clinical course. Our case highlights the importance of obtaining a tissue diagnosis and IHC confirmation whenever unusual PET/CT findings are encountered.

KEY WORDS: Adenocarcinoma rectum, amelanotic melanoma, Flurodeoxyglocose Positron Emission Tomography-Computed Tomography, histopathology, immunohistochemistry

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INTRODUCTION

Melanomas are the malignancies that can affect any anatomic region where melanocytes exist (like the epidermis, eyes, nasal cavity, oropharynx, vagina, urinary tract, rectum, and anus). Anorectal melanoma is a rare mucosal melanocytic malignancy, comprising of 0.8% of all anorectal malignancies.[1] In this case report, we have described the findings of a case of malignant amelanotic melanoma on Flurodeoxyglocose Positron Emission Tomography-Computed Tomography (FDG PET/CT), and confirmed the findings with histopathology along with immunohistochemistry (IHC). In the presented case, amelanotic melanoma masqueraded as adenocarcinoma of the rectum in the pathology as well the clinical course. This resulted in a delay in the establishment of the true diagnosis and initiation of the necessary treatment.

CASE REPORT

A sixty year-old man, diagnosed as a case of poorly differentiated adenocarcinoma of the rectum was referred to our department for a FDG PET/CT scan for the evaluation of the disease status. His treatment history included surgical removal of the primary tumor by abdominoperineal resection (APR) one year back. He was diagnosed as having liver metastases 3 months after the surgery, and had received four cycles of chemotherapy for it. He complained of weight loss of five kilogram in the previous four months. A whole body FDG PET/CT was performed in our department. Figure 1a shows the maximum intensity projection (MIP) image of the whole body FDG PET/CT of the patient in the case report.

The MIP image shows extensive areas of intense FDG uptake throughout the body, which corresponded to enhancing deposits in multiple skeletal muscles. The transaxial CT, PET and PET/CT fusion images [Figure 1b] demonstrated a large hypermetabolic deposit in the right gluteus medius muscle measuring 7.5 × 3.5 cm, and multiple deposits in the left gluteal muscles. Figure 1c shows a similar enhancing lesion in the right splenius capitis muscle. Increased metabolic activity was also noted in the hypodense lesions in the liver. [Figure 1d], corresponding with metastasis. Extensive hypermetabolic deposits in the skeletal muscles were reported as an unusual finding, and we advised a tissue diagnosis to rule out unrelated pathology. It was remarkable that despite

Access this article online
Website: www.cancerjournal.net
DOI: 10.4103/0973-1482.103533
Quick Response Code:

widespread deposits in muscles, patient had no associated musculoskeletal symptoms. An ultrasonography guided biopsy of the deposit in right gluteus muscle was obtained. The malignancy type could not be ascertained with Microscopic examination alone, and hence immunohistochemistry (IHC) tests were performed. The final histopathological diagnosis along with the IHC correlation was of an amelanotic melanoma [Figure 2]. A review of the slides of the initial surgery of APR showed the primary rectal neoplasm to be an amelanotic melanoma. Patient's chemotherapy regimen has been changed after availability of this 'Final Diagnosis'.

DISCUSSION

Amelanotic forms represent an exceedingly rare subtype of melanomas, (though about 30% of anorectal melanomas), and are thought to be biologically more aggressive than the pigmented melanomas. The prognosis is poorer than that of pigmented melanomas because of delays in establishing the correct diagnosis, and treatment initiation.[2] They represent an important diagnostic pitfall for clinicians and a significant management problem for the surgeons.[3] Diagnosis is typically delayed, and the disease often reaches a late stage before detection. Unfortunately, the same holds true in our case. Anorectal melanomas may frequently present with benign and nonspecific symptoms, such as, rectal bleeding (67%), tenesmus (27%), anorectal mass (22%), change in bowel habits (22%), and hemorrhoids (13%). Thirty percent of masses are amelanotic and can be confused with hemorrhoids or skin tags.[4-6]

As the microscopic features of the melanoma occasionally resemble lymphomas, sarcomas, and undifferentiated carcinomas, additional immunohistochemical studies are warranted to reach the diagnosis. Malignant anorectal

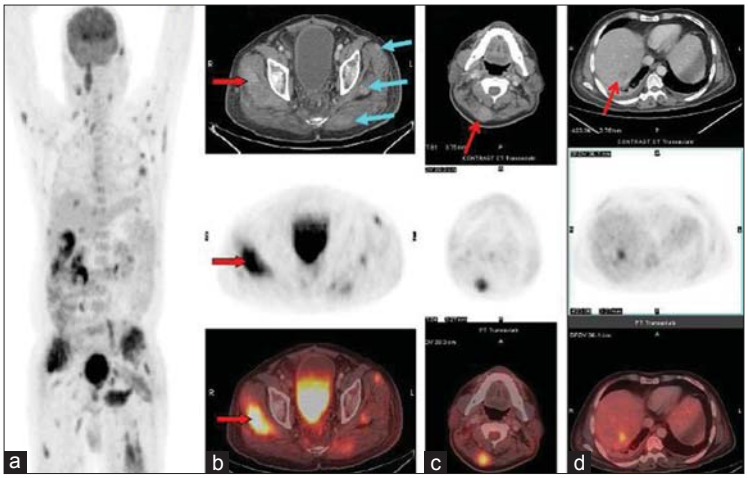

Figure 1: (a) Maximum intensity projection (MIP) image of whole body using Flurodeoxyglocose Positron Emission Tomography-Computed Tomography (FDG PET/CT). The MIP image shows extensive areas of intense FDG uptake throughout the body, which were corresponding to enhancing deposits in multiple skeletal muscles. The transaxial CT, PET and PET/CT fusion images, (b) demonstrate a large hypermetabolic deposit in right gluteus medius muscle measuring 7.5 × 3.5 cm (Standardized Uptake Value - SUVmax = 4.5 cm^2/ml) and multiple deposits in left gluteal muscles, (c) shows similar enhancing lesion in right splenius capitis muscle (SUVmax = 3.4 cm^2/ml). Increased metabolic activity was also noted in hypodense lesions in liver, (d) corresponding with the known metastasis (SUVmax = 2.7 cm^2/ml), Extensive hypermetabolic deposits in skeletal muscles were reported as an unusual finding and we advised a tissue diagnosis to rule out unrelated pathology

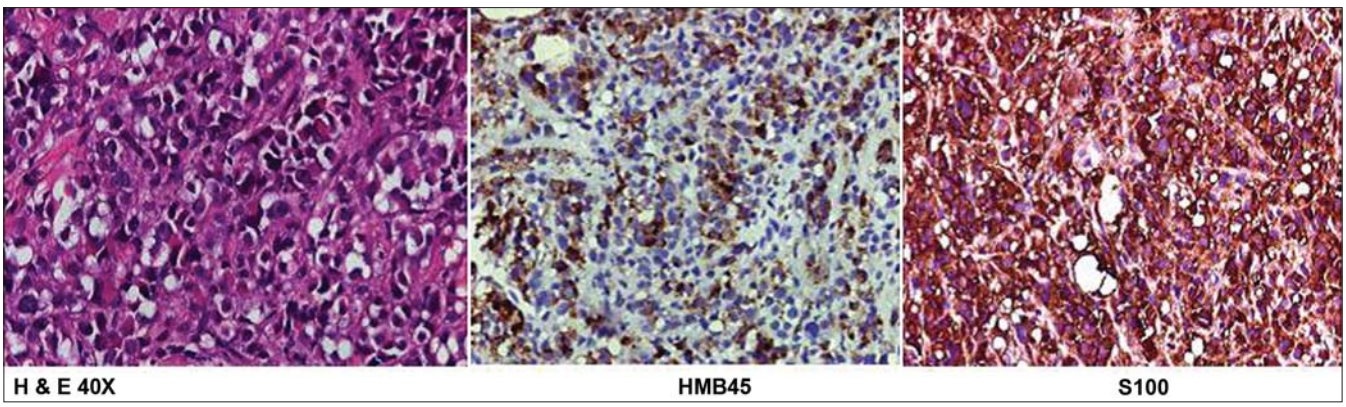

Figure 2: Demonstrates photomicrograph of biopsy of right gluteus muscle deposit that demonstrates melanoma cells staining positive for HMB45 and S100. The findings were compatible with amelanotic melanoma

melanoma will stain for S-100, HMB-45, vimentin, microphthalmia-associated transcription factor proteins, and, occasionally, carcinoembryonic antigen.[7] Our case highlights the significance of IHC studies for reaching an accurate diagnosis. Skeletal muscle metastasis is an unusual occurrence in melanoma. The exact incidence of muscle metastases of melanoma is unknown. There are very few reported cases of muscle metastases from malignant melanomas. The usual clinical manifestation is of a painless mass most commonly located in the psoas, iliopsoas, paravertebral and proximal muscles of the limbs.[8] Other malignancies that are reported to have solitary distant muscle metastases include the breast, esophagus, lung, and kidney cancers; however, descriptions of extensive muscular metastases are exceedingly rare.[9]

FDG PET/CT is considered as a sensitive tool in detecting intramuscular metastases. A recently performed review of one series and 33 case reports of 'detection of muscle metastases on FDG PET/CT' found this modality to impact management in as many as 51% of the cases of malignancies.[10] Apart from the muscle metastasis, increased FDG uptake in muscles can be seen in cases when the patient has been given an insulin injection before the FDG injection, and in muscle inflammatory conditions like myositis.[11] With proper history and fusion imaging with CT, these causes can be diagnosed in most of the cases. FDG uptake in multiple muscle groups as seen in our case can also be seen in cases of systemic inflammatory conditions like dermatomyositis; however, CT finding of enhancing lesions, absence of symptoms related to musculoskeletal system and history of malignancy favored a neoplastic etiology. FDG PET/CT guided the biopsy site in our case by characterizing the metabolic activity of various muscle lesions, and hence the lesion in the right gluteal muscle which showed maximum hypermetabolism (as assesed by Standardized Uptake Value - SUV) was chosen for tissue diagnosis.

In patients of melanoma, FDG PET/CT provides a more comprehensive whole-body assessment as compared to the conventional cross sectional imaging. It has better a capability of detecting regional, nodal and distant metastasis, which could be present at the initial presentation of the disease.[12,13] Use of FDG PET/CT in evaluation of amelanotic melanoma has been described in a few case reports.[14,15] FDG PET/CT was proposed as a better modality for diagnosing occult metastases in these reports. Previously, there have been reports of diagnosis of isolated subscapularis muscle metastasis of melanoma by FDG PET/CTin literature.[16] However our case appears unique, as it describes the detection of extensive and multiple muscle metastases of melanoma on FDG PET/CT. High clinical suspicion after obtaining the FDG PET/CT findings, and a careful histopathological examination played a key role in establishing the diagnosis. Our case, and similar cases reported in past suggest that 'amelanotic melanoma' has been aptly called as 'the great masquerader' in literature.[3]

In conclusion, we present the FDG PET/CT findings of amelanotic melanoma, which is a rare and difficult to diagnose malignancy. We recommend histopathological examination and correlation of the findings with IHC, whenever unusual sites of metabolically active disease are noted in PET/CT scans. Our case and other cases reported in literature suggest that FDG PET/CT can play an important role in diagnosing and staging the amelanotic melanoma.

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Cite this article as: Joshi PV, Lele VR, Aland NJ, Bhat G, Ajinkya SP, Patel RP. Malignant amelanotic melanoma - A diagnostic surprise: Flurodeoxyglocose positron emission tomography-Computed tomography and immunohistochemistry clinch the 'final diagnosis'. J Can Res Ther 2012;8:451-3.

Source of Support: Nil, **Conflict of Interest:** No.