Case Report

Myeloid Sarcoma of the Prostatic Tissue Diagnosed on 18F-FDG PET/CT in Treated Case of Acute Myeloid Leukemia

Abstract

Myeloid sarcoma is a rare extramedullary manifestation of acute myeloid leukemia (AML) that often presents during remission or disease relapse. The most common site of relapse being, however, many rare sites has been reported in the existing literature. We are herewith presenting the case of a 27-year-old patient of AML who showed an unusual site of relapse on fluorodeoxyglucose positron emission tomography/computed tomography scan.

Keywords: *18F-fluorodeoxyglucose positron emission tomography-computed tomography scan, acute myeloid leukemia, chloroma, myeloid sarcoma*

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Introduction

Fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) is an established imaging modality in oncology practice; however, it has shown limited utility for leukemia. Myeloid sarcoma (MS) is extramedullary tumor comprising immature myeloid cells that disrupts the architecture of the tissues in which it is found and is more common in relapsed cases of acute myeloid leukemia (AML).[1] Since FDG shows significant uptake in sarcomas, we used this principle and picked up an unusual site of relapse of AML in prostate which was further confirmed on histopathology.

Case Report

A 27-year-male patient was diagnosed with AML in 2014 with no evidence of any extramedullary involvement. He was treated with induction chemotherapy followed by consolidation chemotherapy (HiDAC regimen) consisting daunorubicin and cytarabine. He underwent two cycles of allogenic homologous stem cell transplantation. Thereafter, he remained disease free until January 2018 when he presented with lower abdominal pain with intermittent urgency in micturition. Per rectal examination revealed an enlarged prostate, with associated tenderness. Ultrasonography of the pelvis raised a possibility of prostatic abscess. However, the patient had no other complaints which would hint toward an infective etiology. Hence, an 18F FDG PET/contrast-enhanced CT was advised with a strong clinical suspicion of disease relapse. On axial and sagittal-fused PET/CT images, increased FDG uptake noted in the prostatic soft-tissue mass also involving bilateral seminal vesicles and [Figure 1a, Figure 1b and d], measures 80 mm × 57 mm in, maximum standardized uptake value 11.48. Transrectal ultrasound-guided biopsy was performed and it revealed hyalinized and crushed tissue with areas of necrosis. Crushed lymphoid cells express Leucocyte Common Antigen (LCA), CD43, and C-kit which was consistent with deposits of extramedullary myeloid tumor in a known case [Figure 1e and f]. The patient received external-beam radiation therapy to entire pelvis followed by 1 cycle of salvage chemotherapy. Posttreatment F18 FDG PET CT scan revealed complete metabolic and near complete morphologic response in prostatic mass lesion as seen on axial and sagittal images [Figure 1c and d]. Since, extramyeloid disease relapse in AML harbors poor outcome, this patient died after 6 months.

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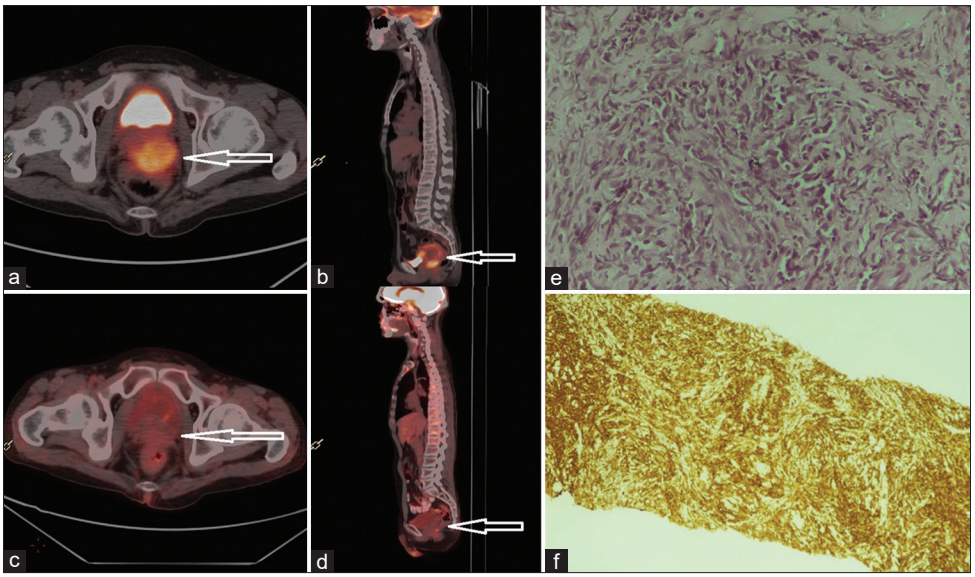

Figure 1: Increased fluorodeoxyglucose uptake is seen in the prostatic soft-tissue mass in positron emission tomography computed tomography axial and sagittal images (a and b) with histopathology slides showing lymphoid infiltrates (H and E, e) and positive computed tomography 43 marker (f). Complete metabolic and near complete morphologic response seen on posttreatment-fused positron emission tomography computed tomography axial and sagittal images (c and d)

Discussion

MS is a rare extramedullary manifestation of AML, it occurs in 3%–5% of AML cases.[2] One study reported that up to 21% of cases of MS presented as relapse after allogeneic bone marrow transplantation.[3] Although PET/CT is sensitive in the identification of leukemic infiltration of the marrow, its specificity is poor as the similar distribution of increased FDG uptake can also be seen in reactive marrow hyperplasia due to anemia, infections, following chemotherapy, or administration of colony-stimulating factors.

However, extra myeloid disease/MS, due to its increased GLUT expression as compared to its adjacent tissue is more easily picked up on FDG PET CT scan. Moreover, thus FDG PET CT provides an incremental value over other anatomical imaging like CT or magnetic resonance imaging in the detection of these sites. The most common sites of involvement include the bones, lymph nodes, soft tissues, skin, and breast.[2] Other less common sites include the genitourinary tract, gastrointestinal tract, head and neck regions, and intrathoracic sites.

In our case, it was prostatic soft-tissue mass which showed increased FDG uptake. Prostatic adenocarcinoma usually does not show increased FDG uptake, due to low GLUT expression and thus PSMA PET CT scan are preferred in these cases. However, in our case, prostatic mass showed intense FDG uptake suggestive of high GLUT expression, which raised a suspicion of nonadenocarcinoma etiology and as our patient was a treated case of AML, possibility of extra MS was much obvious which was later confirmed by histopathology.

MS of the prostate is extremely uncommon and described in only limited case reports. 2016 literature review by Koppisetty *et al*. found eight cases of MS of the prostate from 1997 to 2014, four of which were primary MS. Time to the development of AML in primary MS of the prostate ranged from 3 weeks to 4 months.[1]

Thus, from the above case, we can say that, FDG PET/CT as an assessment tool in suspected cases of relapse with MS seems promising, especially in cases of relapse in rare sites such as the prostate, as depicted in our case.

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.

References

1. Neiman RS, Barcos M, Berard C, Bonner H, Mann R, Rydell RE, *et al*. Granulocytic sarcoma: a clinicopathologic study of 61 biopsied cases. Cancer 1981;48:1426-37.
2. Mortimer J, Blinder MA, Schulman S, Appelbaum FR, Buckner CD, Clift RA, *et al*. Relapse of acute leukemia after marrow transplantation: natural history and results of subsequent therapy. J Clin Oncol 1989;7:50-7.
3. Koppisetty S, Edelman BL, Rajpurkar A. Myeloid sarcoma of the periprostatic tissue and prostate: Case report and review of literature. Urol Ann 2016;8:348-54.