Myeloid Sarcoma as an Extramedullary Manifestation of Acute Myeloid Leukemia Detected with ^{18}F-FDG PET/CT: Case Report

Akut Miyeloid Löseminin Ekstramedüller Bulgusu Olan Miyeloid Sarkomun ^{18}F-FDG PET/BT ile Saptanması

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Geliş Tarihi/*Received:* 23.08.2015
Kabul Tarihi/*Accepted:* 10.07.2016

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ABSTRACT 39-year-old woman presented with symptoms of swelling in the lower neck, cough and shortness of breath. CT of the neck showed mass lesion at anterior mediastinum filling the lodge of thymus. The mass surrounded the large vessels at right neck and trachea at the level of entrance of mediastinum. The patient underwent ^{18}F-FDG PET/CT study for determination of the extent of the disease. Intensely increased FDG uptake at upper middle thorax corresponding to the lesion detected on CT study and hypermetabolic foci scattered through out the both breasts are detected on PET/CT study. The patient underwent tru-cut biopsy from the lesions at both breasts and the lesion at anterior mediastinum and histopathology turned out to be myeloid sarcoma (MS). Bone marrow biopsy was also performed and it revealed acute myeloid leukemia. In conclusion, this case shows the efficacy of ^{18}F-FDG PET/CT in the detection of MS and showing the extension of the disease.

Key Words: Sarcoma, myeloid; positron-emission tomography/ computed tomography

ÖZET 39 yaşında kadın hasta alt boyunda şişlik, öksürük ve solunum sıkıntısı yakınmaları ile başvurdu. Boyun BT'sinde anterior mediastende timus lojunu dolduran kitle lezyonu görüldü. Kitle boyun sağındaki büyük damarları ve mediasten girişinde trakeayı çevrelemekteydi. Hastalığın yayılımının değerlendirilmesi için hastaya ^{18}F-FDG PET/BT uygulandı. PET/BT çalışmasında, üst-orta toraksta BT'de saptanan lezyona karşılık gelen şiddetli artmış FDG tutulumu ve her iki memede yaygın hipermetabolik odaklar saptandı. Hastanın her iki memesindeki ve anterior mediastendeki lezyonlarından tru-cut biyopsi alındı ve histopatoloji sonucu miyeloid sarkom (MS) olarak geldi. Kemik iliği biyopsisi de yapıldı ve sonuç akut myeloid lösemi olarak geldi. Sonuç olarak, bu vaka ^{18}F-FDG PET/BT'nin MS saptanmasında ve hastalığın yayılımını belirlemedeki etkinliğini göstermektedir.

Anahtar Kelimeler: Sarkoma, miyeloid; pozitron-emisyon tomografi/ bilgisayarlı tomografi

Turkiye Klinikleri J Case Rep 2016;24(4):306-9

Myeloid sarcoma (MS) is an extramedullary neoplasm of immature myeloid cells. There has been few reports in the literature on the use of ^{18}F-FDG PET/CT in the evaluation of MS. We present a case of MS identified on ^{18}F-FDG PET/CT and illustrate the utility of ^{18}F-FDG PET/CT in the detection of MS and showing the extension of the disease.

CASE REPORT

39-year-old woman presented with symptoms of swelling in the lower neck, cough and shortness of breath. Computerized tomography (CT) of the

doi: 10.5336/caserep.2015-47599

neck showed mass lesion with homogenous density and lobulated contours which extended from the anterior aspect of thyroid gland to anterior mediastinum and filled the lodge of thymus. The mass surrounded the large vessels at right neck and trachea at the level of entrance of mediastinum. The patient underwent ^{18}Fluorine-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography (PET)/CT for determination of the extent of the disease with an integrated PET/CT scanner which consisted of a full-ring HI-REZ LSO PET and a six-slice CT scanner (Siemens Biograph 6, Chicago, IL). Maksimum intensity projection (MIP) image of the study showed intensely increased FDG uptake at upper middle thorax corresponding to the lesion detected on CT study. There were also hypermetabolic foci scattered through out both breasts. Increased FDG uptake at left shoulder compatible with inflammatory reaction was also noted (Figure 1). Axial slices of PET and CT images showed multiple hypermetabolic nodular lesions at both breasts (Figure 2). Axial slices of PET, CT fusion images of thorax showed increased FDG uptake at the lesion located at the anterior mediastinum (SUV max 8) and hypermetabolic foci at both breasts (Figures 3, 4). The

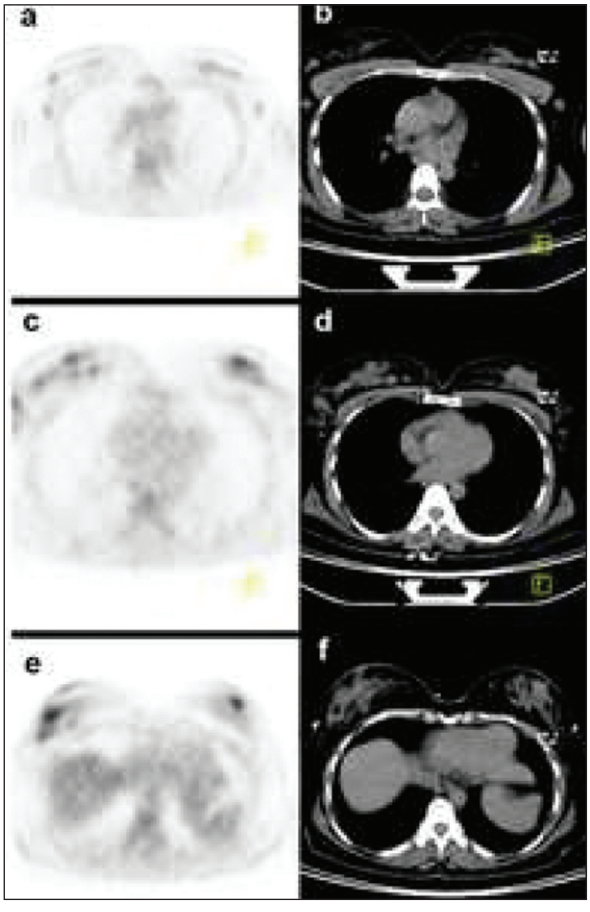

FIGURE 2: Axial slices of PET and CT images show multiple hypermetabolic nodular lesions at both breasts (a-e).

FIGURE 1: MIP image of the ^{18}F-FDG PET/CT.

patient underwent further evaluation with bone marrow biopsy and histopathology turned out to be acute myeloid leukemia (AML). The patient underwent tru-cut biopsy from the lesions at both breasts and the lesion at anterior mediastinum which revealed extramedullary myeloid cell tumor (MS).

DISCUSSION

MS is a tumor consisting of myeloid blasts or immature myeloid cells that accumulate at sites other than bone marrow. These tumors can develop in skin, lymph nodes, gastrointestinal tract, bone, soft tissue, and testes.[1] MS is a rare extramedullary manifestation of (AML). It occurs in 3-5% of AML cases.[2] It may precede, follow or occur synchronously with AML.[3] There have been several reports in the literature underscoring the importance of

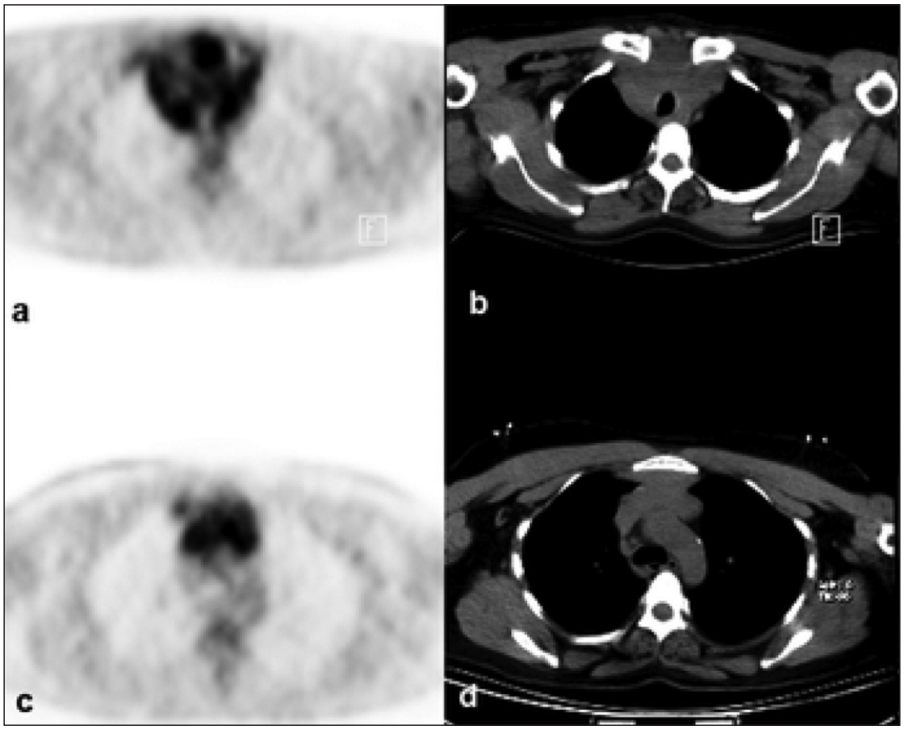

FIGURE 3: Axial slices of PET and CT images of thorax **a-d**) show increased FDG uptake at the lesion located at the anterior mediastinum.

^{18}F-FDG PET/CT in the detection of MS.[4-6] Makis et al, reported a case of anterior mediastinal mass detected with ^{18}F-FDG PET/CT and eventually turned out to be MS.[7] It provides early detection of disease and identification of clinically occult disease, before the disease is detected by anatomical imaging modalities.[8] In this respect, FDG PET is found to be superior or equivalent to CT or magnetic resonance imaging (MRI).[9] ^{18}F-FDG PET/CT is also effective in staging and therapy response evaluation of MS.[8] MS can also develop as a secondary malignancy in patients with acute lymphoblastic leukemia (ALL) and it is useful in diagnosis of such cases.[10] Aschoff et al, studied the efficacy of FDG/PET in the evaluation of 52 untreated or recurrent granulocytic sarcoma (GS) lesions which are extramedullary manifestations of myeloid or lymphoblastic leuka emia. They sho wed that changes in FDG uptake after therapy correlated well with clinical outcome and proposed that PET was more reliable than CT assessment alone.[11] Even though FDG/ PET is used mostly for the evaluation of solid tumors, it may also have some role in the management of liquid tumors. Rao et al, demonstrated the usefulness of FDG-PET for staging and assessment of the treatment response in a patient with extramedullary AML.[12] Stölzel et al, reported in their article that ^{18}F-FDG PET/CT scans were able to detect the known extramedullary lesions in 9 out of 10 patients (90%).[13]

CONCLUSION

In our case 18F-FDG PET/CT proved useful in the detection of MS and showing the extension of the disease. It has also advantage over conventional imaging modalities with its ability of screening whole body in one session.

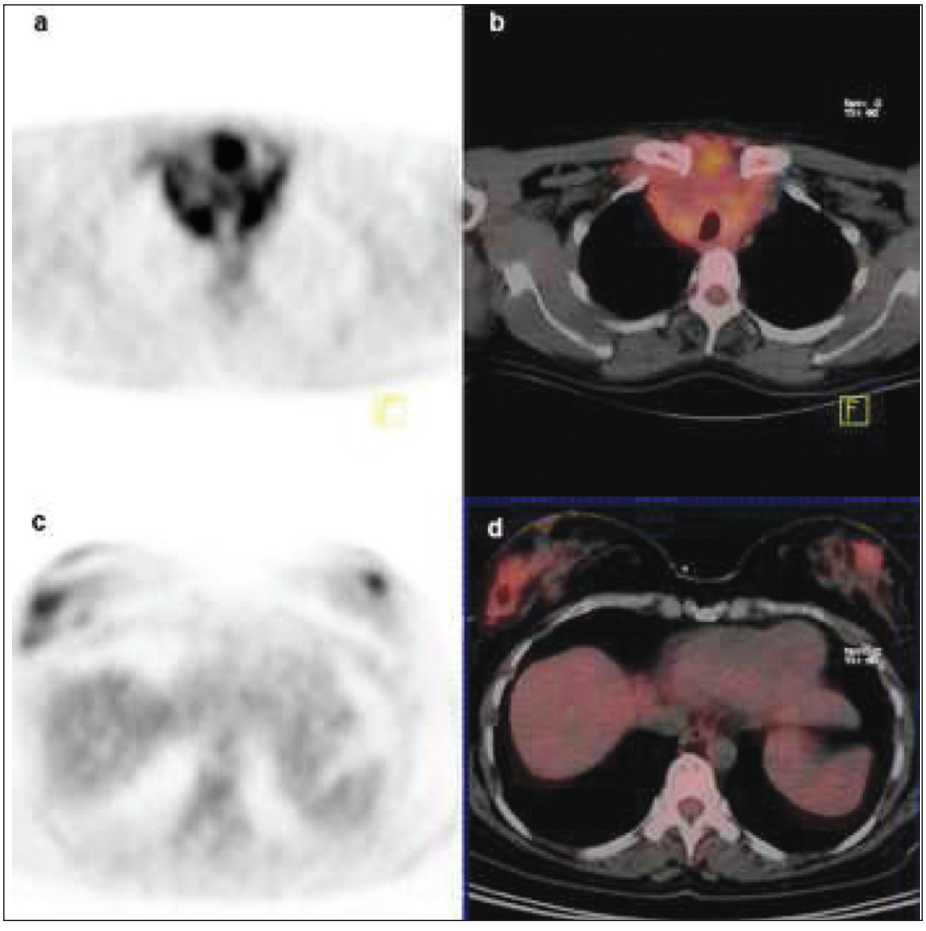

FIGURE 4: Axial slices of PET and fusion images of thorax show hypermetabolic mass at anterior mediastinum **a, b)**, hypermetabolic foci scattered through out the both breasts **c, d).**

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