Interesting Image

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Diagnosis of Atypical Medullary Metastasis in Melanoma Using ^{18}F-FDG PET/CT

^{18}F-FDG PET/CT Kullanılarak Melanoma Bağlı Atipik Medüller Metastaz Tanısı Konması

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Abstract

As part of the therapeutic evaluation, positron emission tomography/computed tomography (PET/CT) using ^{18}F-fluorodeoxyglucose (^{18}F-FDG) was performed on a 39-year-old patient with metastatic melanoma of the left thigh who was subsequently receiving immunotherapy. The examination revealed pathologic hypermetabolic foci in the lymph nodes and liver along with a highly suspicious pathologic hypermetabolic foci in the spinal marrow at the level of the first lumbar vertebra (L1). The presence of such a hypermetabolic focus can significantly decrease survival duration, highlighting the importance of early detection. PET/CT with ^{18}F-FDG proved to be more sensitive and specific than CT alone in identifying occult distant metastases, as the latter may underestimate malignant involvement of the spinal marrow.

Keywords: PET-FDG, melanoma, spinal marrow, metastasis

Öz

Terapötik değerlendirmenin bir parçası olarak, sol uylukta metastatik melanomu olan ve daha sonra immünoterapi alan 39 yaşındaki bir hastaya ^{18}F-florodeoksiglukoz (^{18}F-FDG) kullanılarak pozitron emisyon tomografisi/bilgisayarlı tomografi (PET/BT) uygulandı. Tetkik sonucunda lenf düğümleri ve karaciğerde patolojik hipermetabolik odakların yanı sıra, birinci lomber vertebra (L1) seviyesinde omurilik iliğinde oldukça şüpheli patolojik hipermetabolik odaklar ortaya çıktı. Böyle bir hipermetabolik odağın varlığı, sağkalım süresini önemli ölçüde azaltabilir ve bu da erken teşhisin önemini vurgular. ^{18}F-FDG'li PET/BT'nin, gizli uzak metastazları belirlemede tek başına BT'den daha duyarlı ve spesifik olduğu kanıtlanmıştır; zira BT, omurilikteki malign tutulumu saptayamayabilir.

Anahtar kelimeler: PET-FDG, melanom, spinal kemik iliği, metastaz

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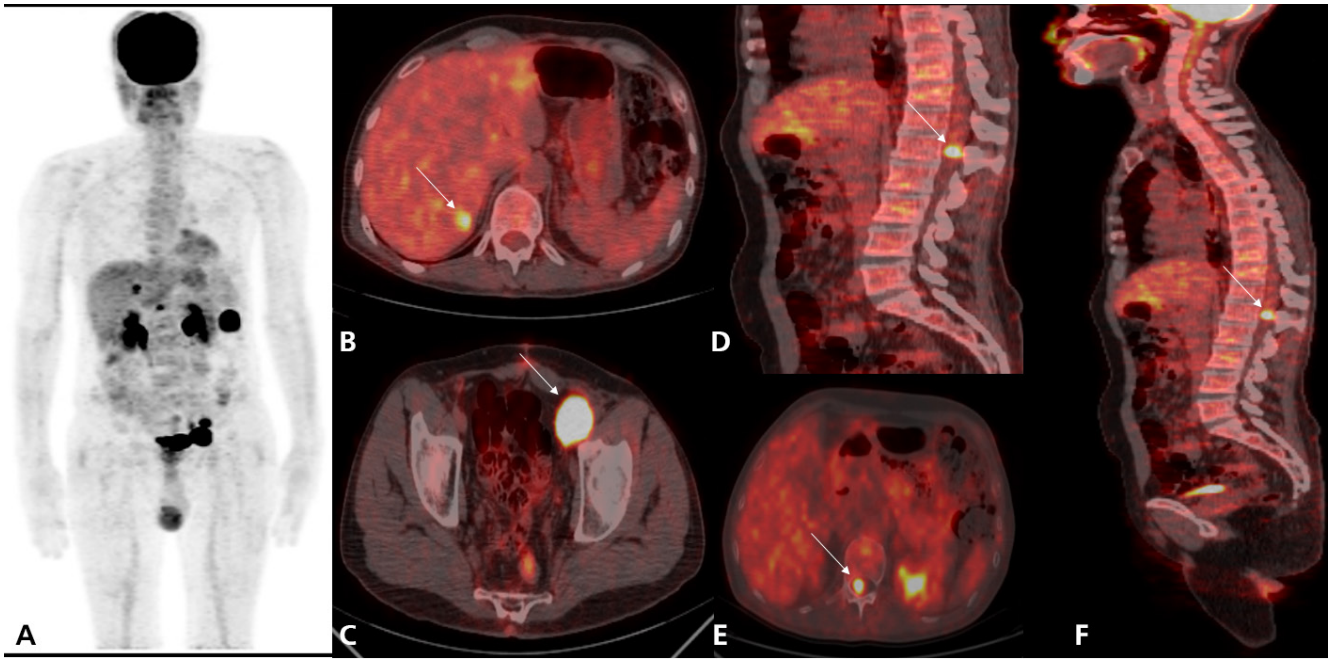

Figure 1. A 39-year-old patient underwent initial surgery in 2019 for melanoma of the left thigh, which was stage 4, followed by secondary surgery for metastatic left inguinal lymphadenopathy. Subsequently, the patient experienced pelvic lymph node recurrence and was placed on immunotherapy with pembrolizumab. As part of the therapeutic evaluation, a positron emission tomography/computed tomography (PET/CT) scan with ^{18}F-fluorodeoxyglucose (^{18}F-FDG) was performed, which showed the physiological and pathological distribution of the radiopharmaceutical (^{18}F-FDG) (maximum intensity projection; A) and revealed scintigraphic progression consistent with persistent disease. This condition was characterized by an increase in size and intensity of the hypermetabolic pathological left external iliac lymph node, measuring 36x29 mm with a maximum standardized uptake value (SUV_{max}) of 27 (fusion image in axial section; arrow; C). Additionally, hypermetabolic pathological foci were observed, including one in segment VII of the liver with an SUV_{max} of 8.6 (fusion image in axial section; arrow; B), and a highly suspicious intense intramedullary focus at the level of the first lumbar vertebra with an SUV_{max} of 9.5 (fusion images in axial and sagittal sections; arrow; D; E; F).

Malignant melanoma is considered one of the most lethal cancers (1), with a poor prognosis once metastasized. A rare site of metastasis for melanoma is the heart, spleen, and spinal marrow, which can significantly reduce survival time, underscoring the importance of early detection (2). Follow-up examinations using ^{18}F-FDG PET/CT have been employed to assess intramedullary lesions, especially in tumors characterized by high-grade malignancy, such as melanoma (3), and ideally must be diagnosed early and confirmed through dedicated magnetic resonance imaging (MRI) (2).

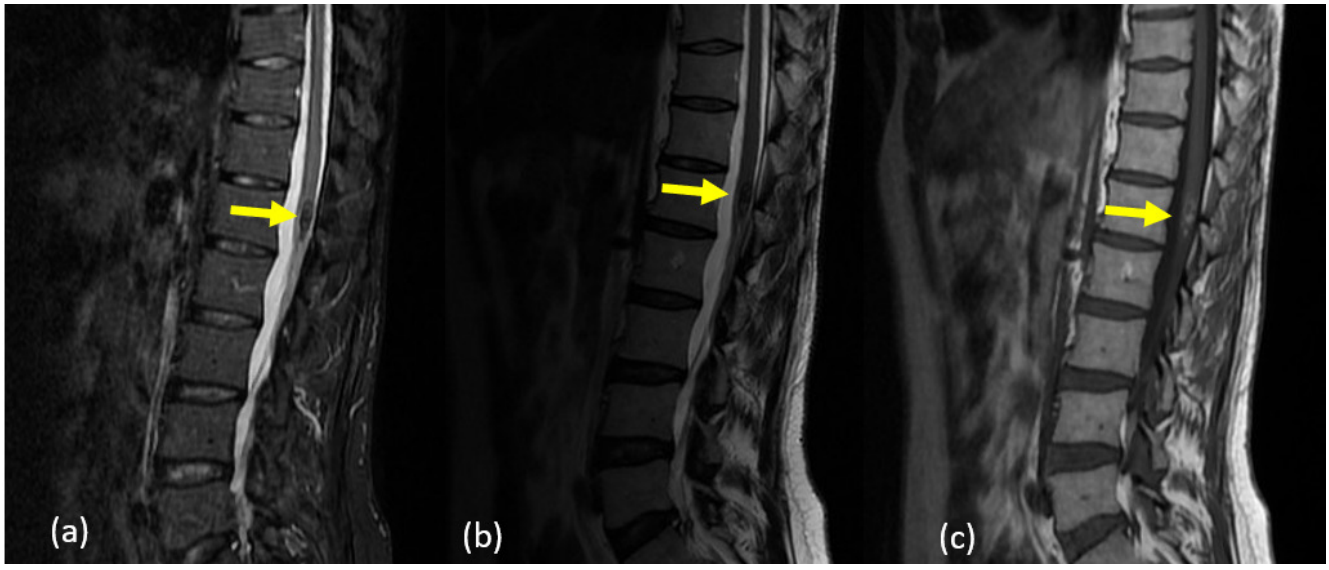

Figure 2. Our patient underwent spinal MRI in short T1 inversion recovery (STIR) sequence (a), in T2 weighting (b), and in T1 weighting without fat saturation (c), which revealed an intracanalicular, intramedullary lesion at the well-defined lobulated contours of the terminal cone at the level of the first lumbar vertebra in STIR and T2 hypointensity (sagittal section; arrow; a; b), and T1 hyperintensity (sagittal section; arrow; c), consistent with a secondary metastatic localization.

The disease course was characterized by the rapid onset of neurological symptoms a few months after diagnosis, followed by worsening and eventual demise.

Regular imaging follow-up is essential for monitoring therapeutic effectiveness and detecting new metastases in patients with malignant melanoma (4). However, there is significant variability in surveillance methods due to limited scientific data. Although no randomized trials have compared follow-up approaches with or without PET/CT imaging, a meta-analysis indicated PET/CT was superior to CT alone in identifying distant metastases, with higher sensitivity (86% vs. 63%) and specificity (91% vs. 78%) (2).

After conducting a comprehensive literature review, we found no similar cases of medullary metastasis from malignant melanoma demonstrated by PET/CT. To the best of our knowledge, we are the first case of this type. Our case highlights the role of ^{18}F-FDG PET/CT in the follow-up of metastatic melanoma by early diagnosis of spinal metastases, even before the onset of clinical symptoms. This underscores the importance of conducting further studies to compare the various imaging modalities used in the therapeutic assessment of metastatic malignant melanoma, particularly at atypical sites, as well as to evaluate their contributions.

Ethics

Informed Consent: Informed consents of the patient was obtained.

Authorship Contributions

Concept: C.B., S.O.N., K.B., O.A.S., Y.B., A.D., Design: C.B., S.O.N., O.A.S., Y.B., A.D., Data Collection or Processing: C.B., Analysis or Interpretation: C.B., S.O.N., A.D., Literature Search: C.B., Writing: C.B.

Conflict of Interest: No conflicts of interest were declared by the authors.

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