Case Report
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Intramedullary Spinal Cord Metastasis from Malignant Mesenchymal Tumor: Detection with FDG-PET/CT

Malign Mezenkimal Tümörde İntramedüller Omurilik Metastazının FGD-PET/BT ile Tespiti

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Abstract

Intramedullary spinal cord metastasis is very rare. In this study, we present the case of a 32-year-old male patient with a 2-month history of bilateral lower extremity weakness. Initial magnetic resonance imaging of the dorsal spine showed abnormal thickening of the dorsal spinal cord at the level of the T1-2 bodies. FDG-PET/CT images revealed a hypermetabolic lesion in the spinal cord at this level. This patient had an intramedullary spinal cord metastasis, a rare form of metastatic disease, secondary to malignant mesenchymal tumor.

Key words: Fluorodeoxyglucose F18, positron-emission tomography, spinal cord, metastasis, intramedullary, malignant mesenchymal tumor

Conflicts of Interest: The authors reported no conflict of interest related to this article.

Özet

İntramedüller spinal kord metastazı çok nadirdir. Bu çalışmada, 2 aydır bilateral alt ekstremite zayıflığı olan 32 yaşındaki erkek olguyu sunduk. Yapılan Magnetik Rezonans görüntülemede torakal vertebra 1-2 seviyesinde omurilikte anormal kalınlaşma görüldü. FDG-PET/BT görüntüler T1-2 seviyesinde omurilikte hipermetabolik lezyon izlendi. Bu hastada metastatik hastalığın nadir formu olan malign mezenkimal tümöre ikincil intramedüller spinal kord metastazıdır.

Anahtar Kelimeler: Florodeoksiglukoz F18, pozitron-emisyon tomografisi, omurilik, metastaz, intramedüller, malign mezenkimal tümör

Çıkar Çatışması: Yazarlar bu makale ile ilgili olarak herhangi bir çıkar çatışması bildirmemiştir.

Introduction

Intramedullary spinal cord metastasis is very rare, accounting for only 0.9-2.1% of all spinal cord metastases. They are usually incidental findings during autopsy, and the low incidence may be attributed to the fact that the spinal cord is not a frequently examined site during routine autopsy (1). The majority of intramedullary metastases are from lung cancer, representing approximately 50% of these lesions. Intramedullary metastases have also been frequently reported to arise from primary lesions such as breast carcinoma, melanoma, lymphoma, renal cell carcinoma, colorectal carcinoma, and unknown primary tumors (2).

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Case Report

A 32-year-old male patient had been treated with systemic agents and local palliative radiotherapy after surgical excision for left cervical malignant mesenchymal tumor. After six months, a magnetic resonance imaging (MRI) was performed for complaints of weakness in the legs and difficulty in walking.

Sagittal T1w images showed isointense but abnormal thickening of the dorsal spinal cord at the level of the T1-T2 bodies (Figure 1a) (between arrows). T2w sagittal image at the same section showed intradural and intramedullary position of the pathology. A probably necrotic focus was seen relatively hyper-intense at the lower border of this lesion (long arrow). Syrinx formation was also present near the upper and lower boundaries of the tumor (Figure 1b) (small arrows). After intravenous gadolinium administration, fat saturated sagittal T1w image demonstrated dense contrast enhancement of the lesion which was diagnosed as dorsal spinal cord metastasis from a known primary malignancy (Figure 1c) (mesenchymal tumor, between arrows).

A whole body ^{18}F-fluoro-2-deoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) (Esoft workstation, Siemens Biograph 6; Chicago, USA) was applied in order to investigate additional metastatic sites. After 6 hours of fasting and with serum glucose level of 97 mg/dL, the patient was injected with 407 MBq (11 mCi) of F-18 FDG intravenously. Transaxial (a) and sagittal (b) FDG-PET and fused images showed intense FDG accumulation (the maximum standardized uptake value (SUVmax): 15.7) along T1-2 spinal cord with no other sites of metastatic spread (Figure 2). Excisional biopsy of the intradural-intramedullary mass in T1-2 vertebrea revealed malignant mesenchymal tumor (Figure 3).

Literature Review and Discussion

Intramedullary spinal cord metastases are very rare, usually solitary lesions, comprising 0.9-5.0% of all spinal cord metastases, and 4% to 9% of all spinal cord tumors. They are usually incidental findings during autopsy, and the low incidence may be attributed to the fact that the spinal cord is not a frequently examined site during routine autopsy (1). It clinically manifests in only 0.1-0.4% of cancer patients, most commonly in lung cancer patients, followed by breast cancer in 11%, melanoma in 5%, renal cell cancer in 4%, colorectal cancer in 3%, lymphoma in 3%, thyroid cancer in 2%, and ovarian cancer in 1%. Approximately 3% are secondary to an unknown primary (3,4,5,6,7,8,9).

The differential diagnosis for intramedullary spinal lesions on imaging studies include pilocytic astrocytoma, radiation myelopathy, sarcoidosis, gliomas, neuropathy, primary spinal epidural non-Hodgkin lymphoma, vascular malformations, and rarely spinal infections such as tuberculosis (9,10,11,12,13,14). The routine imaging modality generally used for the diagnosis of intramedullary spinal cord metastasis is MRI. Other imaging techniques (CT, PET/CT, and angiography) are of limited significance (15,16). PET has a sensitivity rate of 96% in detecting spinal metastasis. This rate is even higher when combined with CT scan (17). As previously mentioned, FDG-PET/CT was used in our case in order to evaluate distant metastases.

The clinical presentation of symptomatic patients range from minor neurological symptoms to major symptoms,

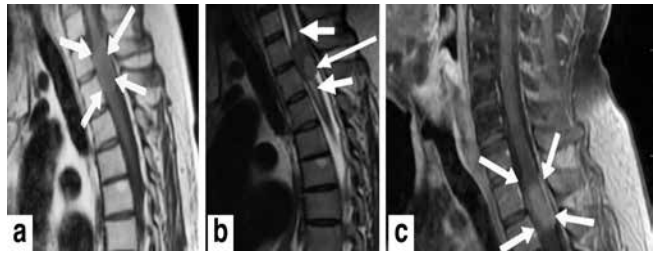

Figure 1a, 1b, 1c. Magnetic resonance imaging revealed a lesion suspicious for metastasis on T1-2 vertebrae

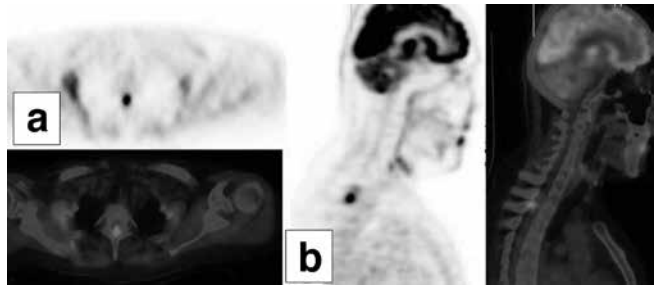

Figure 2. Transaxial (a) and Sagittal (b) FDG-PET and fused images showed intense FDG accumulation (the maximum standardized uptake value (SUVmax): 15.7) along the T1-2 spinal cord with no other sites of metastatic spread

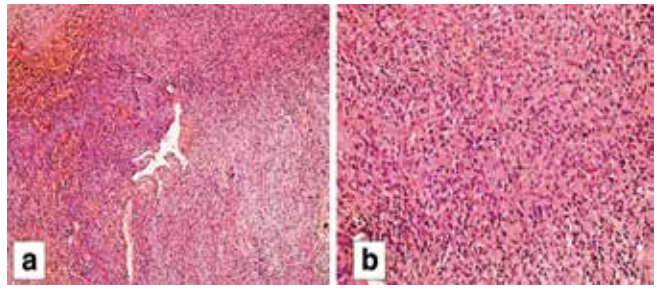

Figure 3. Tumor composed of bundles of spindle cells with cellular atypia and nuclear pleomorphism with areas of hemorrhage and focal necrosis (x100 Hematoxylin and eosin (H&E)) (a). Tumor composed of spindle cells with HE (x200) palisade sequences (b)

mostly presenting rapid progressive neurological deficits that require immediate further examination. With mortality rate is 80% during the first three to four months after the appearance of the first symptom; the overall prognosis is poor (9).

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