18F FDG PET-CT in the Diagnosis of Spinal Cord Involvement Secondary to Non Hodgkins Lymphoma– A Case Report

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ABSTRACT

Spinal cord involvement secondary to non Hodgkin lymphoma (NHL) is rare and associated with quick development of neurological defects. The overall risk of central nervous system relapse in aggressive NHL ranges 2%–27% and is associated with a poor prognosis. Hence early detection is important for staging and prognostication. Magnetic Resonance Imaging (MRI) is the routinely used potential imaging modality for spinal cord metastasis. Several studies have shown the values of 18F FDG (flurodeoxyglucose) PET- CT for staging, restaging, and therapy monitoring in NHL. PET has 96% sensitivity in the detection spinal metastasis. This reported case was a 35 years old male, diagnosed as peripheral T cell lymphoma on June 2014 and was treated with chemotherapy. In January 2016 he developed swelling of lower limbs and paraparesis with bladder and bowel involvement. Duplex color Doppler of lower limbs showed normal flow and Complement Fixation Test for filariasis was negative. MRI T2W showed hyper intensity signal extending from lower cervical to all dorsal cord. The 18F FDG PET-CT was performed to restage the disease and showed intense FDG uptake in the spinal cord, extended from the lower cervical to 11th thoracic and at the level of 3rd and 4th lumbar vertebrae. The spinal cord hypermetabolism observed on PET CT scan correlated with MRI characteristics and significantly aided in the diagnosis of spinal cord involvement.

This case is reported to emphasize the usefulness 18F FDG PET-CT in restaging and follow-up of patients with NHL. PET-CT imaging can reliably identify hyper-metabolic central nervous system involvement and help not only to restage patients but also to guide new therapeutic strategies.

Key words: Spinal cord, lymphoma, FDG PET-CT.

INTRODUCTION

Spinal cord involvement secondary to non Hodgkin lymphoma (NHL) is rare and the occurrence rate accounts from 0.1% to 6.5% (1-2). Involvement usually occurs in early stage of the disease and is associated with quick development of morbid neurological defects (3). The frequency of secondary involvement of central nervous system with systemic lymphoma varies and is highly dependent on histologic subtype of the disease. Based on clinical characteristics, lymphoma is divided into aggressive and indolent types. The overall risk of central nervous system relapse in aggressive NHL ranges 2%–27% and is associated with a poor prognosis (4-5). It is therefore important to identify involvement of the central nervous system for staging and prognostication. Magnetic resonance imaging (MRI) has revolutionized assessment of metastatic spinal tumor. Many imaging modalities play a role in evaluating patients with metastatic spinal tumor including computerized tomography (CT) scan, myelogram, angiogram and positron emission tomography (PET). PET has 96% sensitivity in the detection spinal metastasis which could be increased when combined with CT (6). Several studies have shown the value of FDG PET- CT for staging, restaging, and therapy monitoring of NHL (7- 8). The purpose of this case report is to emphasize the usefulness 18F FDG PET-CT in restaging for detection of spinal cord metastasis and follow-up of patients with NHL.

CASE REPORT

This reported case was a 35 years old male, diagnosed as a case of peripheral T-cell lymphoma on June 2014 and was treated with total 12 cycles of chemotherapy.

In January 2016, he developed swelling of lower limbs and paraparesis with impairment of urinary bladder and bowel function. In diagnostic workup of leg swelling, duplex color Doppler of lower limbs showed normal flow and complement fixation test (CFT) for filariasis was negative. MRI T2W showed hyperintensity signal extending from lower cervical to all dorsal cord (Figure 1a). The 18F FDG PET-CT (Figure 1b, c, d) was performed to restage the disease and showed intense FDG uptake (SUVmax-7.9) in the spinal cord, extended from the lower cervical to 11th thoracic and at the level of 3rd and 4th lumbar vertebrae. The spinal cord hypermetabolism observed on PET scan correlated with MRI characteristics and significantly aided in the diagnosis of spinal cord involvement.

DISCUSSION

This patient was referred to NINMAS with paraparesis and leg swelling after two years of NHL diagnosis and completion of chemotherapy cycles for PET-CT scan. Intense 18 F FDG uptake (SUVmax-7.9) was noted in the spinal cord, extended from the lower cervical to thoracic and lumbar vertebral level has suggested spinal cord involvement. Abnormal FDG distribution in spinal cord correlated with the findings revealed on MRI-T2 images.

In a study, it was shown that that aggressive NHL had high 18F FDG avidity in 97% cases (9). Study conducted in a tertiary referral center showed FDG avidity in the spinal canal greater than the normal contents of the spinal cord suggests leptomeningeal disease, the presence of cytologically proven metastasis in subarachnoid space. Increased FDG distribution also corresponded to the extent of enhancement in MRI images. Follow up studies after chemotherapy demonstrated interval change of normalization of spinal FDG avidity and reduction of enhancement in MRI images (10). Similar to this reported case another case report by P. Mapelli et al reported a case of secondary spinal cord involvement of NHL where PET CT was done on for restaging and showed intense FDG uptake and MRI confirmed the presence of intradural subarachnoid pathological tissue (11).

Another study conducted in patients with intramedullary spinal cord metastasis from NHL showed sub-acute onset of symptom in six patients out of seven and four patients were wheel chair dependent. Spinal cord metastasis in two patients showed hypermetabolism in PET scan which were in agreement with the mode of presentation and PET-CT findings (3). In this reported case, extensive spinal involvement could be evaluated due to high FDG avidity. PET-CT scan contributed significantly in restaging and further treatment.

CONCLUSION

PET-CT imaging can reliably identify hyper-metabolic central nervous system involvement in NHL patients and help not only to restage patients but also to guide new therapeutic strategies.

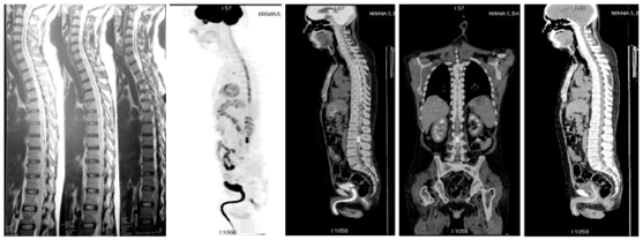

Figure 1: (a) MRI T2W image showed hyper-intensity signal extending from lower cervical to all dorsal cord. (b) Maximum intensity projection (MIP) of F-18 FDG PET scan showed intense tracer uptake in cervical and dorsal region. (c) Sagittal PET-CT fusion image and (d) Coronal PET- CT fusion image confirmed the spinal cord uptake, extending from the lower cervical to D11and at the level of L3 & L4 vertebrae. (e) Sagittal CT image however, showed no discernible feature corresponding to the lesions in MRI or PET.

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