Clinical vignette

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# Neurolymphomatosis diagnosed on [$^{18}$F]FDG PET/CT

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## Abstract

Fluorine-18-deoxyglucose positron emission tomography/computed tomography ([$^{18}$F]FDG PET/CT) has been shown to be superior to other conventional imaging modalities in the detection of extra-nodal lymphomatous localizations. Especially in neurolymphomatosis which is rarely encountered in high-grade lymphomas. We report a case of a woman diagnosed with non-Hodgkin lymphoma, whose initial staging with [$^{18}$F]FDG PET/CT showed increased [$^{18}$F]FDG uptake along the brachial and sacral plexuses. [$^{18}$F]FDG PET/CT remains the most appropriate diagnostic tool in these cases, whose prognosis is often poor.

**KEY words:** neurolymphomatosis; FDG-PET/CT; non-Hodgkin lymphoma

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A 38-year-old woman with diffuse large B-cell lymphoma, diagnosed after a left cervical lymph node biopsy, presented with severe neuropathic-type pain radiating down her right thigh. A few days later, the patient developed numbness in her left leg, followed by weakness. This weakness became bilateral, resulting in bilateral foot drop. An fluorine-18-deoxyglucose positron emission tomography/computed tomography ([$^{18}$F]FDG PET/CT) was done as an initial extension of her lymphomatous disease and objectified linear abnormal uptake along both brachial plexus, in both sacral plexus, and the bilateral sciatic nerves. A nerve biopsy was not performed due to clinical circumstances. The combination of clinical history, physical examination, and PET/CT were used to confirm the final diagnosis of neurolymphomatosis. Interim [$^{18}$F]FDG PET/CT performed after four chemotherapy cycles of rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisone (R-mini-CHOP) demonstrated complete resolution at these sites.

Neurolymphomatosis (NL) is a rare neurological disorder characterized by the infiltration of malignant lymphocytes into the peripheral nerves, resulting in a variety of neurological symptoms [1] almost always associated with B-cell non-Hodgkin's lymphoma, occasional cases have been reported to be associated with T-cell lymphomas, with an estimated prevalence of 0.2% of all non-Hodgkin lymphomas [2]. The clinical signs and symptoms of NL can vary depending on the specific nerves involved and the extent of nerve infiltration. In most cases, they are non-specific and can be caused by other neurological conditions such as paraneoplastic neuropathies, chronic inflammatory radiculoneuropathies, neurofibromatosis, and malignant tumors of the peripheral nerve sheath [3]. It is usually difficult to diagnose NL using conventional imaging modalities, in this context [$^{18}$F]FDG PET/CT has an important place, it allows the lesion to be accurately localized and gives an indication of the metabolic activity of the lesion, which provides useful information on the differential diagnostics [4]. There is no consensus treatment regime for NL, most patients undergo systemic chemotherapy alone or combined with intrathecal chemotherapy or external beam radiotherapy [5]. Unfortunately, the prognosis remains extremely poor once NL has developed despite the administration of high-dose methotrexate and rituximab-containing chemotherapy with or without auto-stem cell transplant [6].

[$^{18}$F]FDG PET/CT imaging is the most sensitive modality for detecting NL and it excels in identifying extracranial disease. This case demonstrates how hybrid imaging plays an important role in detecting and monitoring NL.

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## Conflicts of interest

The authors declare no conflicts of interest.

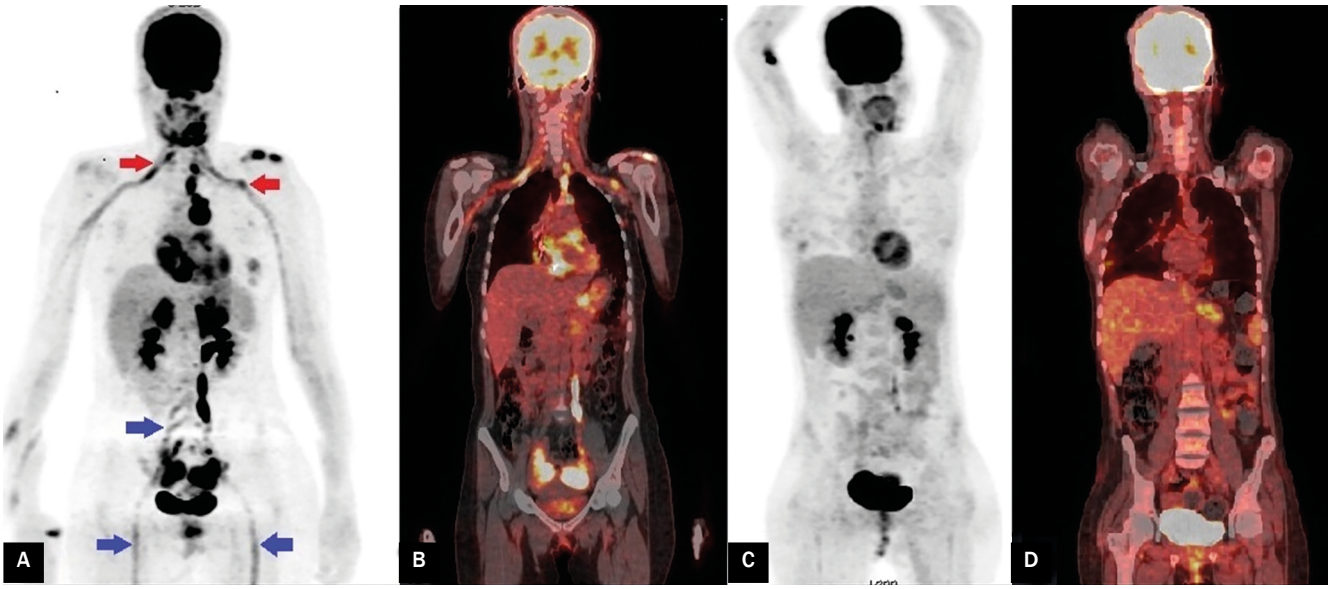


**Figure 1.** [18F]FDG PET/CT whole-body maximum intensity projection image (**A**) and coronal fused image (**B**) reveals linear abnormal uptake along the brachial plexus (reds arrows), and in both sacral plexus and the bilateral sciatic nerves (blue arrows); follow-up [18F]FDG PET/CT: whole-body maximum intensity projection image (**C**) and coronal fused image (**D**) shows complete resolution at these sites

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