

18F-FDG PET/CT/MRI Fusion Images Showing Cranial and Peripheral Nerve Involvement in Neurolymphomatosis

Abstract

We report a 56-year-old female patient with non-Hodgkin's diffuse large B cell lymphoma (NHL) who, on magnetic resonance imaging (MRI) with a T1 weighted and gadolinium-enhanced imaging, was found to have thickening and infiltration in 75% of peripheral nerves of the patient and enlargements of cranial nerves, possibly related to lymphomatous infiltration. Subsequent positron emission tomography/computed tomography (PET/CT) using ¹⁸F-labeled 2-deoxy-2-fluoro-d-glucose (¹⁸F-FDG) showed widespread active involvement of the cervical plexus, bilateral peripheral nerves, right femoral nerve, the parasellar region of the skull, and marked hypermetabolism in the left trigeminal ganglia. This case re-emphasizes that while CT and MRI provide anatomical details, ¹⁸F-FDG PET/CT images better delineate the metabolic activity of neurolymphomatosis (NL) in the peripheral and central nervous system.

Key words: ¹⁸F-FDG, neurolymphomatosis, non-Hodgkin lymphoma, PET/CT

A 56-year-old female patient with non-Hodgkin's diffuse large B-cell lymphoma (NHL) presenting with hoarseness, nasal obstruction, left facial paralysis, and numbness was confirmed to have aseptic meningitis on lumbar puncture examination. Treatment started for meningitis and chemotherapy for lymphoma. The patient continued to show clinical and neurological deterioration with confused state and a decreased level of consciousness. Gadolinium-enhanced T1 weighted magnetic resonance imaging (MRI) image showed thickening and infiltration in 75% of peripheral nerves of the patient and enlargements of cranial nerves, possibly related to lymphomatous infiltration. Subsequently patient was subjected to ¹⁸F-labeled 2-deoxy-2-fluoro-d-glucose (¹⁸F-FDG) positron emission tomography/computed tomography (PET/CT) [Figure 1].

Neurolymphomatosis (NL) is a rare disorder characterized by infiltration of nerves, aggressive subtypes of NHL or leukemia.^[1,2] It is related to peripheral nervous system infiltration by lymphomatous lymphocytes cells of cranial nerves, trunk nerves, nerve roots, and plexus in the setting of a hematologic malignancy.^[3] Most commonly, NL presents as a painful polyneuropathy

or polyradiculopathy, followed by cranial neuropathy, painless polyneuropathy, and peripheral mononeuropathy.^[4] Diagnosis requires a high index of clinical suspicion and histopathologic confirmation of an involved nerve by biopsy, or at autopsy. Brain and spinal nerves MRI, and CT of the trunk are essential in providing an overview of the structural involvement, but in some cases, just anatomic images can

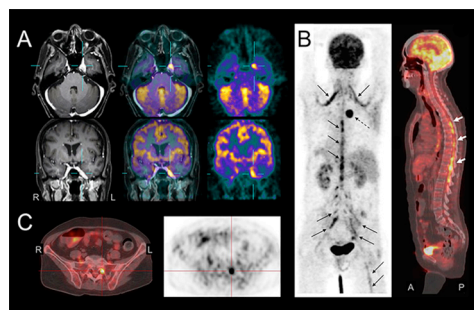


Figure 1: ¹⁸F-FDG PET/CT/MRI fusion showed thickening and infiltration in 75% of peripheral nerves and enlargements of cranial nerves in the parasellar region of the skull with marked hypermetabolism in the left trigeminal ganglia (A), possibly related to lymphomatous infiltration. ¹⁸F-FDG PET/CT showing widespread active involvement of the cervical plexus, bilateral peripheral nerves, and Right femoral nerve (B) with a conspicuous lymphomatous infiltration through the lateral foramina in the lumbar spine (C). (R, Right; L, left; A, anterior; P, posterior)

This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Trevisan AC, Ribeiro FB, Itikawa EN, Alexandre LS, Pitella FA, Santos AC, Simoes BP, Wichert-Ana L. 18F-FDG PET/CT/MRI fusion images showing cranial and peripheral nerve involvement in neurolymphomatosis. *Indian J Nucl Med* 2017;32:77-8.

Ana Carolina Trevisan^{1,3}, Fernanda Borges Ribeiro², Emerson Nobuyuki Itikawa^{1,3}, Leonardo Santos Alexandre¹, Felipe Arriva Pitella¹, Antonio Carlos Santos¹, Belinda Pinto Simões², Lauro Wichert-Ana^{1,3}

¹Nuclear Medicine and Molecular Imaging Section and, ²Division of Hematology of the Internal Medicine Department and Postgraduation Program, Ribeirão Preto Medical School, University of São Paulo, São Paulo, ³Bioengineering Interunits Postgraduation Program, São Carlos School of Engineering, University of São Paulo, São Carlos, Brazil.

Address for correspondence:

Ms. Ana Carolina Trevisan, MSc. Seção de Medicina Nuclear do Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto – SP, Brasil. Av. Bandeirantes, 3900 - Monte Alegre, Ribeirão Preto - SP
E-mail: acstrevisan@yahoo.com.br

Access this article online

Website: www.ijnm.in

DOI: 10.4103/0972-3919.198502

Quick Response Code:



be ineffective in showing the active malignancy.^[5] In this setting, PET/CT is being highly recommended to evaluate the extent of disease throughout the body complementing the anatomical images.^[6-8] This case evidences that 18F-FDG PET/CT images better delineated the metabolic activity of NL in the peripheral and central nervous system.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest.

References

1. Gan HK, Azad A, Cher L. Neurolymphomatosis: Diagnosis, management, and outcomes in patients treated with rituximab. *Neuro Oncol* 2010;12:212-15.
2. WEN-LAN Z. Usefulness of 18F-FDG PET/CT in the detection of neurolymphomatosis. *Nuclear Med Comm* 2014;35:1107-11.
3. Levitt LJ, Dawson DM, Rosenthal DS. CNS involvement in the non-Hodgkin's lymphomas. *Cancer* 1980;45:545-52.
4. Baehring JM, Batchelor TT. Diagnosis and management of neurolymphomatosis. *Cancer J* 2012;18:463-68.
5. Shimizu I, Hamano Y, Sato S. Neurolymphomatosis in a patient with extranodal NK/T-cell lymphoma, nasal-type: A case report and literature review. *Intern Med* 2014;53:471-75.
6. Baehring JM, Damek D, Martin EC. Neurolymphomatosis. *Neuro Oncol* 2003;5:104-15.
7. Grisariu S, Avni B, Batchelor TT. Neurolymphomatosis: An International Primary CNS Lymphoma Collaborative Group report. *Blood* 2010;115:5005-11.
8. Peterson J, Caliskan B, Bonyadlou S. Positron emission tomography/computerized tomography imaging of multiple focus of neurolymphomatosis. *Indian J Nucl Med* 2014;29:52-53.