^{18}F-FDG PET/CT in Localizing Additional CNS Lesion in a Case of Langerhans Cell Histiocytosis: Determining Accurate Extent of the Disease

Abstract

Central nervous system involvement is a rare manifestation of Langerhans cell histiocytosis (LCH), with bone and skin lesions being more frequent. MR remains the investigation of choice for localizing brain lesions. However, due to poor sensitivity of MRI in detecting osseous and pulmonary lesions, it is not used routinely in staging purposes until and unless indicated. We hereby discuss a case of 6-year-old boy of LCH who was referred for 18-F-FDG PET/CT for staging and knowing the extent of the disease, but a lesion in hypothalamus was picked up incidentally on FDG PET-CT study that was confirmed by MRI.

Key words: *Central nervous system (CNS) involvement, FDG PET-CT, MRI, Langerhans cell histiocytosis*

Shamim Ahmed Shamim, Sarthak Tripathy, Anirban Mukherjee[1], Chandrasekhar Bal, Madhavi Tripathi

Department of Nuclear Medicine, All India Institute of Medical Sciences, New Delhi, [1]Department of Nuclear Medicine, Eastern Diagnostics, Kolkata, India

A 6-year-old boy came to the pediatrics OPD with chief complaints of generalized bodyache with a stinging-like sensation throughout the body for 6 months. He had also developed burning micturition since 3 months with increased frequency of micturition. On further examination, generalized erythematous skin rashes were noted. The patient was referred for skin biopsy that revealed features of Langerhans cell. Immunohistochemistry was positive for CD1. The patient was referred for an 18-F-Fludeoxyglucose Positron Emission Tomography-Computed Tomography (FDG PET/CT) scan that revealed multiple FDG avid lytic lesions involving skull bones and tibia with increased FDG uptake. Incidentally, a focus of FDG uptake was noted in the hypothalamus in brain [Figure 1]. For further confirmation of the lesion, MRI was performed.

Langerhans cell histiocytosis (LCH) is a rare neoplastic disease of antigen-presenting cells, with an incidence rate of 4.0-5.4/1 million individuals.[1] The most frequent sites of occurrence are skin, bone, and central nervous system (CNS).[2] CNS involvement in LCH can be classified into tumorous, non-tumorous, and atrophic lesions. Tumorous lesions can include involvement of hypothalamus, hypothalamic-pituitary axis such as enhancement and thickening of pituitary stalk, enlargement of pineal gland, extra-axial space involvement, and intra-cerebral granulomatous lesions. Non-tumorous lesions include involvement of dentate nucleus and deep white matter changes.[3] Because the lesions are characterized by proliferation of histiocytes, they commonly show increased 18F-FDG uptake.[4] Thus, 18F-FDG PET/CT helps in detecting the extent of involvement (staging) of the disease. It helps in choosing the treatment options and is also useful in prognostication of the disease.[5] Previous

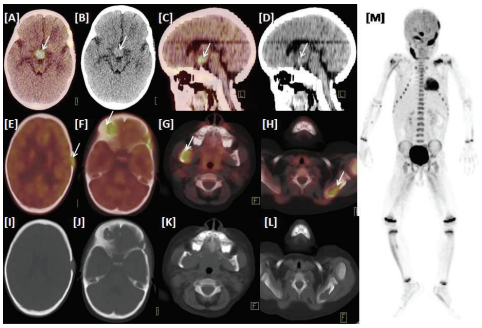

Figure 1: 18-F-Fludeoxyglucose Positron Emission Tomography–Computed Tomography (FDG PET/CT) scan revealed multiple FDG avid lytic lesions involving skull bones and tibia with increased FDG uptake. Incidentally, a focus of FDG uptake was noted in the hypothalamus in brain

How to cite this article: Shamim SA, Tripathy S, Mukherjee A, Bal C, Tripathi M. 18-F-FDG PET/CT in localizing additional CNS lesion in a case of langerhans cell histiocytosis: determining accurate extent of the disease. Indian J Nucl Med 2017;32:162-3.

Address for correspondence:
Assistant Professor Shamim Ahmed Shamim, Department of Nuclear Medicine, All India Institute of Medical Sciences, New Delhi, India.
E-mail: sashamim2002@yahoo.co.in

Access this article online
Website: www.indjsp.org
DOI: 10.4103/0972-3919.202253
Quick Response Code:

reports of LCH in FDG PET/CT imaging mostly show bone, lung, lymph node, or skin invasion. To the best of our knowledge, only one case reported by Kruljac *et al*.[6] described hypothalamic involvement of LCH on FDG PET-CT. Thus, the present case gives an insight into the appearance of a rare disease, which can serve as a baseline study for the assessment of treatment response later and further establish the role of FDG PET-CT as a whole body imaging modality in staging of LCH.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest

References

1. Donadieu J, Rolon MA, Thomas C, Brugieres L, Plantaz D, Emile JF, *et al.* French LCH Study GroupEndocrine involvement in pediatric-onset Langerhans' cell histiocytosis: A population-based study. J Pediatr 2004;144:344-50.
2. Behrens RJ, Levi AW, Westra WH, Dutta D, Cooper DS. Langerhans cell histiocytosisof the thyroid: A report of two cases and review of the literature. Thyroid 2001;11:697-705.
3. Porto L, Schöning S, Hattingen E, Sörensen J, Jurcoane A, Lehrnbecher T. Central nervous system imaging in childhood Langerhans cell histiocytosis a reference center analysis. Radiol Oncol 2015;49:242-9.
4. Lee HJ, Ahn BC, Lee SW, Lee J. The usefulness of F-18 fluorodeoxyglucose positron emission tomography/computed tomography in patients with Langerhans cell histiocytosis. Ann Nucl Med 2012;26:730-7.
5. Sager S, Yilmaz S, Sager G, Halac M. Tc 99m bone scan and fluorodeoxyglucose positron emission tomography in evaluation of disseminated Langerhans cell histiocytosis. Indian J Nucl Med 2010;25:164-7.
6. Kruljac I, Balenović A, Gaćina P, Imashuku S, Vrkljan M. Complete response of adult-onset CNS Langerhans cell histiocytosis documented on 18F-FDG PET/CT. Clin Nucl Med 2015;40:981-2.