

The role of ^{18}F -FDG PET/CT in Better Follow up in Patient with Hodgkin Lymphoma: A Case Report

Mehrdad Payandeh¹, Mehrnoosh Aeinfar¹, Masoud Sadeghi², Edris Sadeghi^{3,*}

¹Department of Hematology and Medical Oncology, Kermanshah University of Medical Sciences, Kermanshah, Iran

²Medical Biology Research Center, Kermanshah University of Medical Sciences, Kermanshah, Iran

³Department of Nursing, Borujerd Branch, Islamic Azad University, Borujerd, Iran

*Corresponding author: sadeghi_mkn@yahoo.com

Abstract PET/CT scans have recently become the gold standard in determining the extent of HL, with a specificity and sensitivity that is superior to that of CT scans alone. Herein, we survey relationship between PET/CT with follow up in Hodgkin disorder. On November 14, 2016, for 36 years old man with complaint of mass sensation with radicalular neck pain, sonography in the axillary right region was done and in report multiple lymph nodes with cortical thickening and hilar obliteration. In complementary IHC that was done in other center CD 10, Ki67, CD 5, CD 21 and CD 23 were negative and CD 68, Pax5, CD 3 were positive. Low dose CT images (30 mAs and 120 KV) without contrast were obtained for attenuation correction and anatomical localization purposes showed Hodgkin's lymphoma with initial staging (metabolically active conglomerated nodal disease in the left axillary region accompanied by a suspicious focal involvement of the spleen PET/CT images can be a very useful guide for a doctor and, in part, to exclude a patient and his/her family from psychological feedback in order to get the right decision.

Keywords: CD, hodgkin lymphoma, PET/CT

Cite This Article: Mehrdad Payandeh, Mehrnoosh Aeinfar, Masoud Sadeghi, and Edris Sadeghi, "The role of ^{18}F -FDG PET/CT in Better Follow up in Patient with Hodgkin Lymphoma: A Case Report." *American Journal of Cancer Prevention*, vol. 5, no. 3 (2017): 41-43. doi: 10.12691/ajcp-5-3-5.

1. Introduction

Hodgkin's lymphoma (HL) affects patients of all ages, particularly adolescents and young adults (ages 16–34) and relapses occur in 20-30% of patients with HL [1]. Lymph tissue is found throughout the body in lymph nodes, the spleen, the thymus gland, adenoids and tonsils. The digestive tract, and bone marrow. It comprises mainly lymphocytes, which can be differentiated into B and T cells. B cells make antibodies, and 85% of all non-Hodgkin's lymphoma (NHL) affects the B-cell lymphocytes [2]. HL usually involves the upper mediastinum and primarily and HL can be categorized into 4 different histologic subtypes: nodular sclerosis (most common), lymphocyte predominance, mixed cellularity, and lymphocyte depletion [3]. The widespread use of Positron Emission Tomography/Computerized Tomography (PET/CT) takes advantage of the anatomic resolution of the CT scan provided by ^{18}F Fluoro-de-oxy Glucose (FDG)-PET. Together, it results in the improvement in the accuracy of detecting the extent of disease, response evaluation, and prognostication [4] herein, we survey relationship between PET/CT with follow up in Hodgkin disorder.

2. Case Presentation

On November 14, 2016, for 36 years old man with

complaint of mass sensation with radicalular neck pain, sonography in the axillary right region was done and in report multiple lymph nodes with cortical thickening and hilar obliteration (maximum diameters were seen 33*16.5 mm). Conservative treatment recommended for pain and biopsy for definite diagnosis. On December 5, 2016, core needle biopsy (CNP) from right axillary masses revealed hyper cellular smear containing many polymorphic lymphocytes and scattered R.S like cells in a bloody background that Suggested of HL. So, surgical biopsy recommended and done. On December 31, 2016, Pathology reported HL is in histomorphologic differential and IHC staining for CD 30, CD 3, CD 15 and CD 20 were positive in R.S like cells, positive in diffuse, negative in large cells and positive in vague germinal centers, respectively but complete IHC study is recommended. In staging in Spiral CT scan of neck, lung, abdomen, and pelvis with showed in the right axillary, a large number of lymphadopathies with a maximum diameter 30 mm. Pharynx, salivary glands, thyroid, mediastinum, lung, liver, spleen, bile, kidney, adrenals, pancreas, para aorta and pancreas have been normal. In complementary IHC that was done in other center CD 10, CD 68, Ki67, Pax5, CD 3, CD 5, CD 21 and CD 23 did for his follow the recommendations that were negative, positive in large cells in clusters, positive in 10% , positive in follicular pattern, Negative, Negative, showed expanded FDC meshwork and negative in FDC meshwork, respectively. Interpretation of these marker was nodular lymphocytic predominant HL. The patient and her family

were still hesitant to start treatment. He was given final biopsy that reported HL, lymphocytic predominance right axillary lymph-node involvement. But that did not solve the patient's doubts as to the decision. Finally in August 12, 2017, PET/CT scan could help him. Low dose CT images (30 mAs and 120 KV) without contrast were obtained for attenuation correction and anatomical localization purposes showed HL with initial staging (metabolically active conglomerated nodal disease in the

left axillary region accompanied by a suspicious focal involvement of the spleen (Figure 1). He accept his disease and he start chemotherapy with R-CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone plus rituximab) protocol. R-CHOP is different treatment policy despite classic regimen of ABVD in HL. Recently in histology form of nodular type in HL is different and new regimen that classically recommended in NHL subtype.

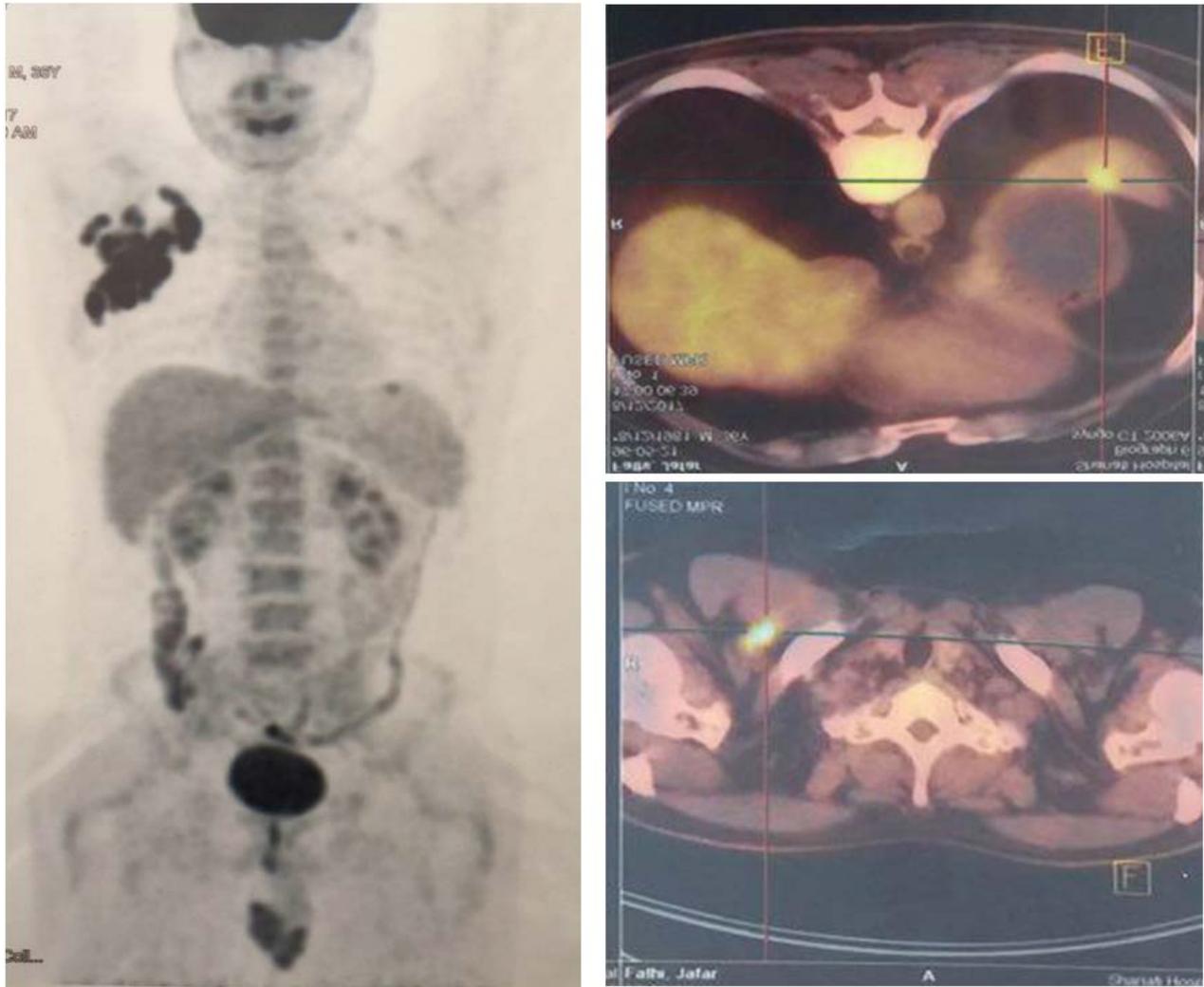


Figure 1. PET/CT scan images

3. Discussion

PET/CT scans have recently become the gold standard in determining the extent of HL, with a specificity and sensitivity that is superior to that of CT scans alone [5]. The role of FDG-PET in the management of patients with lymphoma is clear [6]. International guidelines have recommended that PET-CT should be used for staging of FDG-avid lymphomas [7]. In this article it help us for more accurate staging and help to doctor for more convincing reason for patient treatment. It has the potential to influence both the initial choice of chemotherapy and alterations to the management of the disease based on the response to therapy [6]. The low-dose CT parameters are a pitch of 1.5:1, a speed of 15 mm/rotation, a helical thickness of 5 mm, and a voltage of 140 peak kilovoltage. The current depends on body mass

index (BMI). Fifty mill amperes are used for a low BMI (0–25), 75 mA for a medium BMI, and 120 mA for a high BMI [8]. Also, lesions smaller than 5–10 mm may not be resolved on a PET/CT scan [9] like our study. Areas of abnormal ^{18}F -FDG uptake can be assessed visually and with the assistance of standardized uptake values (SUVs). SUVs semiquantitatively calculate the concentration of metabolic activity in a certain area divided by the dose administered, taking into account patient weight and decay time of dose [10]. In our study showed Low dose CT images (30 mAs and 120 KV) without contrast were obtained for attenuation correction and anatomical localization.

The equation is as follows [11]:

$$\frac{\text{Decay - corrected activity [kBq]} / \text{tissue volume [mL]}}{\text{Injected } ^{18}\text{F - FDG avidity [kBq]} / \text{body weight [g]}}$$

4. Conclusion

PET/CT images can be a very useful guide for a doctor and, in part, to exclude a patient and his/her family from psychological feedback in order to get the right decision.

References

- [1] Payandeh M, Sadeghi M, Sadeghi E. Maintenance Therapy with Procarbazine and Chlorambucil without Autologous Stem Cell Transplantation as a New Option for Patient with Hodgkin Lymphoma. *Sch. J. App. Med. Sci.* 2015; 3(1E): 363-366.
- [2] Non-Hodgkin lymphoma. American Cancer Society Web site. Available at: <http://www.cancer.org/acs/groups/cid/documents/webcontent/003126-pdf.pdf>. Published October 25, 2010. Accessed May 20, 2011.
- [3] Jaffe ES, Harris NL, Stein H, Vardiman JW. World Health Organization Classification of biopsy and PET/CT results. *Annals of Oncology.* 2002; 13(3): 490-1.
- [4] Gota VS, Purandare NC, Gujral S, Shah S, Nair R, Rangarajan V. Positron emission tomography/computerized tomography evaluation of primary Hodgkin's disease of liver. *Indian J Cancer.* 2009; 46(3): 237-9.
- [5] Hutchings M., Loft A., Hansen M. Position emission tomography with or without computed tomography in the primary staging of Hodgkin's lymphoma. *Haematologica.* 2006; 91: 482-489.
- [6] Jhanwar YS, Straus DJ. The role of PET in lymphoma. *J Nucl Med.* 2006; 47: 1326-1334.
- [7] Cheson BD, Fisher RI, Barrington SF, et al; Alliance, Australasian Leukaemia and Lymphoma Group; Eastern Cooperative Oncology Group; European Mantle Cell Lymphoma Consortium; Italian Lymphoma Foundation; European Organisation for Research; Treatment of Cancer/ Dutch Hemato-Oncology Group; Grupo Espan˜ol de M˜dula O˜sea; German High-Grade Lymphoma Study Group; German Hodgkin's Study Group; Japanese Lymphoma Study Group; Lymphoma Study Association; NCIC Clinical Trials Group; Nordic Lymphoma Study Group; Southwest Oncology Group; United Kingdom National Cancer Research Institute. Recommendations for initial evaluation, staging, and response assessment of Hodgkin and non-Hodgkin lymphoma: the Lugano classification. *J Clin Oncol.* 2014; 32(27): 3059-3068.
- [8] Procedure Manual: PET/CT Scan Tumor Imaging. Boston, MA: Beth Israel Deaconess Medical Center, Division of Nuclear Medicine; 2008.
- [9] Podoloff DA, Macapinlac HA. PET and PET/CT in management of the lymphomas. *Radiol Clin North Am.* 2007; 45: 689-696.
- [10] Jhanwar YS, Straus DJ. The role of PET in lymphoma. *J Nucl Med.* 2006; 47: 1326-1334.
- [11] Allen-Auerbach M, de Vos S, Czernin J. The impact of fluorodeoxyglucose positron emission tomography in primary staging and patient management in lymphoma patients. *Radiol Clin North Am.* 2008; 46: 199-211.