Eur J Gen Med 2014; Suppl 1: 38-40
DOI : 10.15197/sabad.1.11. 28

Case Report

18F-FDG PET/CT Findings in Primary Bilateral Adrenal Lymphoma

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ABSTRACT

The adrenal localization of a primary non-Hodgkin lymphoma is rare. We report a case of a 51-year-old man with adrenal insufficiency, cough and elevated eritrosit sedimentation rate. Conventional imaging studies ultrasonography (US) and computed tomography (CT) demonstrated bilateral bulky adrenal masses, and whole-body F-18 fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) showed that the masses and peripancreatic lymphadenopathy were the unique manifestations of this disease. The patient was eventually diagnosed with a diffuse large B-cell non-Hodgkin lymphoma after a CT-guided needle adrenal biopsy. The present case indicated that primary adrenal lymphoma should be included in the differential diagnosis of bilateral adrenal masses.

Key words: *Non-hodgkin lymphoma, adrenal gland, neoplasm, PET, CT*

Primer İki Taraflı Adrenal Lenfoma'da 18F-FDG PET/BT Bulguları

ÖZET

Adrenal kaynaklı primer non-Hodgkin lenfoma nadir görülen bir klinik durumdur. Bu vaka çalışmasında adrenal yetmezlik, öksürük ve sedimentasyon yüksekliği bulguları olan 51 yaşında bir erkek hasta sunulmaktadır. Konvansiyonel görüntüleme yöntemleri (ultrasonografi, bilgisayarlı tomografi) ve F- 18 fluorodeoksiglukoz pozitron emisyon tomografisi/ bilgisayarlı tomografi (18F-FDG PET/BT) tüm vücut görüntüleme ile büyük adrenal kitleler ve peripankreatik lenf nodları gösterilmiştir. 18F-FDG PET/BT görüntülerinde diğer vücut bölgelerinde patoloji izlenmemiştir. Bilgisayarlı tomografi eşliğinde yapılan adrenal iğne biopsisi sonrası diffüz büyük-hücreli non-Hodgkin lenfoma tanısı konuldu. Bu vaka çalışması bilateral adrenal kitlelerin ayırıcı tanısında primer adrenal lenfomanın da düşünülmesi gerektiğini göstermektedir.

Anahtar kelimeler: *Non-hodgkin lenfoma, adrenal bez, neoplazm, PET, BT*

INTRODUCTION

Non-Hodgkin lymphoma (NHL) arising from endocrine glands represent only 3% of extranodal lymphomas (1). Primary adrenal lymphoma (PAL) is an extremely rare entity. A possible diagnosis of this entity should be suspected in cases presenting with a bilateral adrenal mass, with or without lymphadenopathy, and with or without affected endocrine function. Moreover, it should be differentiated from a possible metastatic disease involving both surrenal glands and from other conditions affecting the adrenals such as congenital adrenal hyperplasia, bilateral pheochromocytoma, infections and traumatic hemorrhage. Percutaneous biopsy is the gold standard method to define the nature of the mass; however it is an invasive technique and associated with several complications. Other diagnostic modalities like as ultrasonography (US), computed tomography (CT), magnetic resonance imaging (MRI) and gallium 67 scintigraphy have been used in the diagnosis of isolated cases of PAL (2-5). All of these modalities have certain advantages and disadvantages (3,6).

As a new imaging modality, F18 fluorodeoxyglucose

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Received: 03.05.2011, Accepted: 17.04.2012

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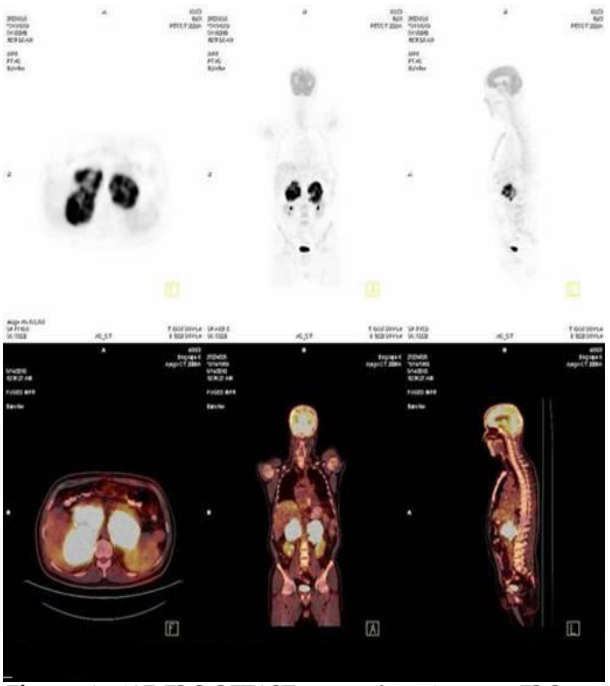

***Figure 1**. 18F-FDG PET/CT scans show intense FDG uptake in bilateral adrenal masses and peripancreatic lymphadenopathy.*

positron emission tomography/computed tomography (18F-FDG PET/CT) is a useful diagnostic tool because its combination of two different imaging modalities may enable differentiation of adrenal malignant lesions from benign ones. 18F-FDG PET/CT provides anatomic and metabolic information for most cases of cancer and has several advantages over other techniques. Firstly, it has faster attenuation correction and lower locational mismatches compared with the PET system alone. Secondly, metabolic imaging by 18F-FDG PET/CT is not only complementary to images obtained by traditional modalities but also may be more sensitive because alterations in tissue metabolism generally precede anatomic changes. In addition, by consensus, maximum standardized uptake value (SUVmax) is commonly used clinically as the best index to assess disease activity in 18F-FDG PET/CT imaging (7).

CASE

We report a case of a 51-year-old man who had severe fatigue, weight loss, low-grade fever and abdominal pain. The physical examination revealed poor general conditions, irritability and dehydration. The abdomen was painful at right and left hypochondrium. He underwent abdominal us which showed the presence of a hypoechogenic mass within the splenorenal left region and hepatorenal right region. The presence of the surrenal and peripancreatic masses were confirmed by CT scan which showed an enlarged left adrenal gland (70x83 mm) of solid structure. The right adrenal gland was also enlarged (76x91 mm). CT scan-guided fine needle aspiration biopsy was then carried out on the left adrenal mass. It revealed the presence of NHL type B with large cells. Bone marrow biopsy revealed lymphocytic involvement of the marrow. The serum lactate dehydrogenase level was 1305 U/L (N<225 U/L). A 18F-FDG PET/CT scan was acquired for further staging of the disease. The patient fasted for at least 4 h before 18F-FDG PET/CT scan. Whole-body PET/CT images were acquired at 1 h after intravenous injection of 18F-FDG. Whole body scan showed intense 18F-FDG uptake in both adrenal glands (SUVmax: 24 in the left, 25.2 in the right region) and peripancreatic mass that presumably considered conglomerated LAP (SUVmax: 21.6). There was no abnormal 18F-FDG uptake in the other parts of the body. Based on the localised intense 18F-FDG uptake in the adrenals, a diagnosis of primary bilateral adrenal lymphoma was made (Figure 1).

DISCUSSION

Primary endocrine lymphomas are less encountered clinical entities accounting for less than 3% of extranodal lymphomas (8). In particular, PAL is an extremely uncommon condition (9), as opposed to secondary adrenal lymphomas which occur in about 25% of cases of B-cell lymphoma on post-mortem examination (10). They generally present with bilateral adrenal masses with moderate to severe adrenal enlargement (sizes ranging from 30 to 170 mm) (9,11). Patients present with fever, weight loss, abdominal pain and the symptoms of primary adrenal insufficiency (11,12). Sometimes additionally to the classical clinical symptomatology of lymphomas, the clinical picture of adrenal insufficiency may predominate or precede the other manifestations because of diffuse type of infiltration and complete destruction of the architecture of the adrenal glands (12). Histologically, 90% of primary adrenal lymphomas are of B-cells, usually large, that diffusely infiltrate the tissue

(11,13,15). Image guided fine needle aspiration biopsy of the adrenal is the procedure of choice to establish the diagnosis (11,13). Although it may sometimes be non-diagnostic due to necrotic areas (14).

In cases of radiographically indeterminate adrenal masses nuclear imaging is recommended for tumor diagnosis and appropriate therapy. The main contribution of radionuclide imaging consists of functional information for tumor characterization. Since malignant tumors show an enhanced glycolytic metabolism with increased 18F-FDG uptake, PET is proposed for diagnosis, staging and detecting recurrences of adrenal malignities. A differentiation between malignant and benign adrenal lesion can be performed using 18F-FDG PET/CT with more than 95% accuracy (16,17). Several studies show a clear increase of 18F-FDG activity in malignant adrenal tumors, reflecting high glucose metabolism (16,17,18).

Although most patients with PAL have a very poor prognosis, early diagnosis and treatment lead to prolonged disease free survival in these patients (19). More frequent use and wide availability of US, CT and MRI will render a larger number of incidentally discovered adrenal masses. Therefore, it is important to differentiate benign from malignant adrenal masses and diagnose PAL during its early stages. Unlike CT and MRI, 18F-FDG PET/CT is based on increased glucose metabolism in malignant lesions. It has been shown to have an important role diagnosis, staging, monitoring response to treatment, and detecting recurrence of various cancers (20). In conclusion 18F-FDG PET/CT is a valuable noninvasive imaging technique for diagnosis, staging and evaluation of the response to treatment of this entitiy.

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