PET/CT POSITIVE PULMONARY MASS IN A HEAVY SMOKER WOMAN: AN UNEXPECTED DIAGNOSIS

YOĞUN SİGARA İÇİCİSİ BİR KADINDA PET/CT POZİTİF PULMONER KİTLE: BEKLENMEYEN BİR TANI

Ahmet Emin ERBAYCU [1] **İnci ALACACIOĞLU** [2] **Bahriye PAYZIN** [2]
Fevziye TUKSAVUL [1] **Nur YÜCEL** [3] **Kenan Can CEYLAN** [4]
Sadi BENER [5] **Engin ÖZBİLEK** [6] **Salih Zeki GÜÇLÜ** [1]

[1]İzmir Training And Research Hospital For Thoracic Medicine And Surgery, The Department of Chest Diseases, İzmir, Turkey
[2]İzmir Atatürk Training And Research Hospital, The Department of Haematology, İzmir, Turkey
[3]İzmir Training And Research Hospital For Thoracic Medicine And Surgery, The Department of Pathology, İzmir, Turkey
[4]İzmir Training And Research Hospital For Thoracic Medicine And Surgery, The Department of Thoracic Surgery, İzmir, Turkey
[5]İzmir Atatürk Training And Research Hospital, The Department of Pathology, İzmir, Turkey
[6]İzmir Training And Research Hospital For Thoracic Medicine And Surgery, The Department of Nuclear Medicine, İzmir, Turkey

Key words: Nodular sclerosing Hodgkin's Lymphoma, pulmonary mass, lymph node, PET/CT
Anahtar sözcükler: Nodüler sclerozan Hodgkin Lenfoma, akciğer kitlesi, lenf nodu, PET/CT

Received: 06 / 03 / 2011 Accepted: 16 / 06 / 2011

SUMMARY

Lung involvement of thor acic lymphomas at the onset of the disease is relatively uncommon.

A 35 years old housewife, with a history of 22 package year cigarette smoking, referred with cough and haemoptysis. Thorax computed tomography (CT) revealed a large cavitary mass lesion on right lung with multiple mediastinal and left hilus lymphoadenopathy.

Having no pathological diagnosis after trans thoracic needle biopsy, 18FDG PET/CT helped to exhibit the diffusiveness of the disease and to see a systemic disease with multiple localizations. Peripheral lymph node biopsy revealed a stage

ÖZET

Torasik lenfomaların hastalığın başladığı dönemdeki akciğer tutulumu nadirdir. Yirmi iki paket yılı sigara öyküsü olan 35 yaşında bir ev hanımı öksürük ve hemoptizi ile başvurdu. Toraks bilgisayarlı tomografisi (BT) multipl mediastinal ve sol hiler lenfadenopati ile birlikte sağ akciğerde geniş bir kaviter kitle lezyonunu ortaya koydu.

Trans torasik iğne biyopsisinden patolojik tanı elde edilemeyince, 18 FDG PET/CT hastalığın yaygınlığını belirlemek ve multipl lokalizasyonları olan sistemik bir hastalığı tanımada yardımcı oldu. Pe riferik lenf nodu biyopsisi evre IVB

IVB nodular sclerosing Hodgkin's Lymphoma. The patient had complete response to chemotherapy.

Pulmonary lymphomas may imitate other pulmonary diseases with their similar clinical and radiological signs. 18 FDG PET/CT is helpful to avoid delay in diagnosis in some cases as it reveals all localizations and the dissemination of the disease.

nodüler sklerozan Hodgkin Lenfomayı gösterdi. Hastada kemoterapi ile tam yanıt alındı.

Pulmoner lenfomalar benzer klinik ve radyolojik bulguları ile diğer akciğer hastalıklarını taklit edebilirler. 18FDG PET/CT hastalığın yaygınlığını ve tüm lokalizasyonlarını gösterdiğinden bazı hastalarda teşhisin gecikmesini engellemektedir.

INTRODUCTION

Lymphomatous proliferation may involve the lungs by three ways: (1) by haematogenous dissemination of Hodgkin Disease or non-Hodgkin lymphoma, (2) by contiguous invasion from a hilar or mediastinal nodal lymphoma involvement (3) by primary pulmonary involvement. The first two are related with progression or relapse of diagnosed lymphomatous disease and the required treatment is the treatment of haematological disease (1).

Thoracic lymphomas, which are very common especially in patients with Hodgkin's Lymphoma (HL), are characterised by enlargement of mediastinal lymph nodes, parenchymal abnormalities, and pleural, pericardial and chest wall involvement (2). Lung involvement at the onset of the disease is relatively uncommon and is found in about 10-12% of patients with HL (3,4). Pulmonary lymphoma may mimic other pulmonary diseases including asthma, lung cancer (5,6). Invasive diagnostic methods are usually required to achieve exact diagnosis. Should diagnosis and treatment are delayed, it may cause widespread disease.

This is a presentation of a patient with HL mimicking lung cancer with her smoking history, clinical and radiological signs.

CASE

A 35 years old housewife referred with cough and haemoptysis. She has had these complaints for four months. She had been treated with antibiotics by another center along six weeks because of pneumonia on chest radiography. She told that she was still suffering symptoms and the clinical situation was getting worse. In her history, there was an appendectomy 10 years ago, bilateral excision of inguinal lymphadenopathy without no pathological examination 5 years ago. She has been using medication for anxiety for four years. She has a history of 22 package year cigarette smoking and there was no use of alcohol or narcotic agent. Her mother had died of an unknown haematological disease and father had died of atherosclerotic heart disease.

In chest radiography, there was a cavitary density on right hilus and a density on left hilus. Thorax computed tomography (CT) revealed a large cavitary mass lesion on superior segment of right lower lobe and posterior segment of right upper lobe with multiple mediastinal and left hilus lymphoadenopathy (Figure 1).

In laboratory; routine biochemical tests were normal with a haemoglobin 10 gr/dl, haematocrit: %30.1, leucocyte: 14.400/mm^3, granulocyte %87, lymphocyte %10.3, monocyte %2.7, thrombocyte: 360.000/mm^3, anti HIV (-), anti HCV (-), HBsAq (-). The direct examination of sputum acid resistant bacilli and Löwenstein Jensen culture were negative.

In fiberoptic bronchoscopy; the bronchi of superior segment of right lower lobe was narrowed and the bronchial mucosa was

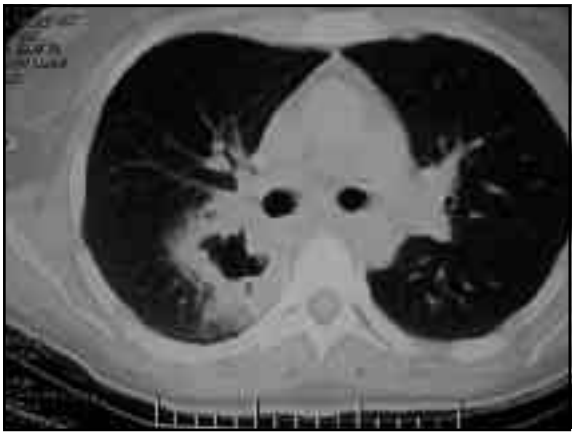

Figure 1. Thorax CT reveals a mass with cavitation on the right lower lobe.

hyperemic and irregular. Bronchoscopic trans bronchial needle biopsy was suspected malign and the cytology of brush biopsy and bronchial lavage fluid were benign. Trans thoracic needle biopsy was performed and revealed signs of a indifferent malignant tumor without any tumor cell subtype. As the pulmonary mass was not completely peripheral, we could not perform a Tru-Cut biopsy.

We decided to perform a whole body fluorine-18 fluorodeoxyglucose (18FDG) - positron emission tomography / computed tomography (PET/CT) to search the extra-pulmonary involvement and also to detect the requirement of surgery for diagnosis and treatment. There were increased 18FDG uptake of malignity level; on mass lesion at anterior segment of right upper lobe (SUVmax:15.3); on mass lesion invading both superior segment of right lower lobe and posterior segment of right upper lobe (SUVmax:20.8); at lymph nodes of paracardiac (SUVmax:6.4), left hilus (SUVmax:8.3), subcarinal (SUVmax:6.9), precarinal (SUV max:6.9), right lower and upper paratracheal (SUVmax:7.4 and 5.2), left upper paratracheal (SUVmax:4.9), anterior mediastinal (SUVmax: 5.6), bilateral supraclavicular (SUVmax: right 5.8 and left 8.6), bilateral interpectoral (SUVmax: right 4.8 and left 4.3), left axillar (SUVmax:4.5), left lateral cervical (SUVmax: 2.9), bilateral inferior jugular (SUVmax: right 5.9 and left 3.3), gastrohepatic (SUVmax:12.6), celiac (SUVmax:13.1), superior mesenteric (SUVmax:7.3), portal (SUVmax:6.2), para-aortic (SUVmax:9.9), right retrocrural (SUV max:5.5); and at right surrenal gland (SUV max:5.4) (Figure 2 and Figure 3).

Two excisional lymph node biopsy, 0.4 cm and 0,8 cm, was performed at right supra-clavicular site. In histopathology, there were Reed-Sternberg cells. In immunohisto-chemistry, Bcl-x was negative, CD-3 was negative, CD-30 was positive, CD-20 was focal positive, Fascin was positive. Stage IVB nodular sclerosing Hodgkin's Lymphoma was diagnosed (Figure 4). The biopsy of

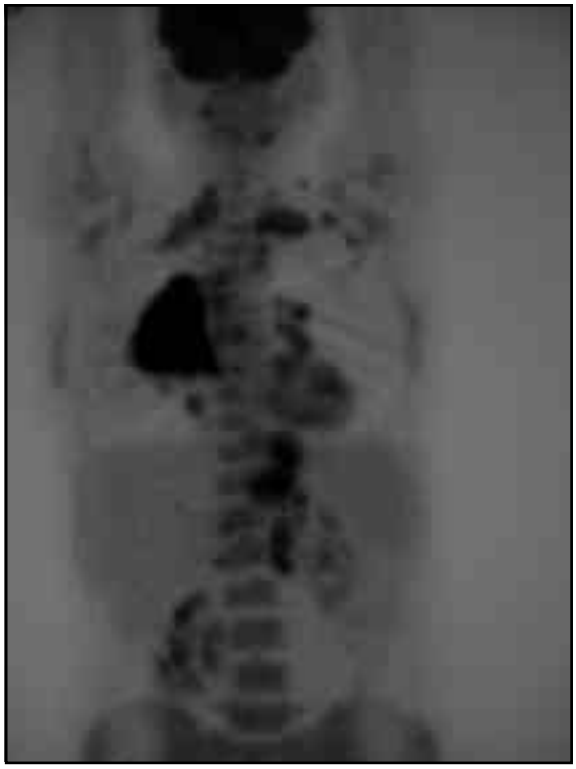

Figure 2. Multipl lesions with higher SUVmax in whole body 18FDG-PET/CT.

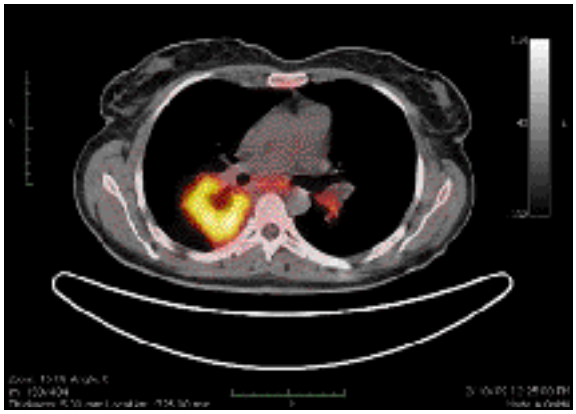

Figure 3. 18FDG uptake of malignity level on mass lesion at superior segment of right lower lobe.

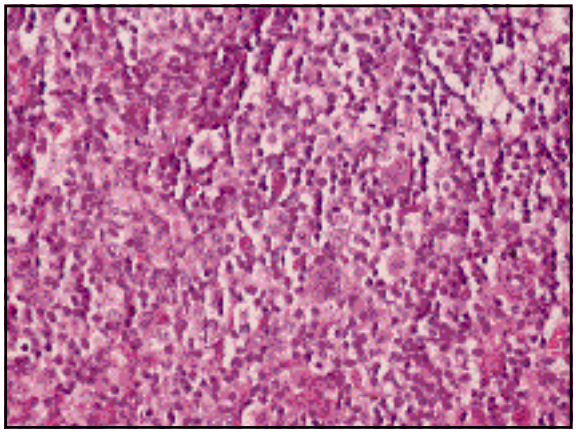

Figure 4. (HE 40x10) Reed-Sternberg cells in lymph node.

bone ma rrow revealed no involvement for disease.

A combined chemotherapy was initiated with doxorubicine 25 mg/m ^{2} IV (day 1,15), bleomycin 15 mg IV (day 1,15) vinblastin 6 mg/m^2 IV (day 1,15) and dacarbazin 375 mg/m^2 IV (day 1,15).

Eight cycles of chemotherapy was completed. There is regression at all of the sites of disease and patient has not any symptom. The control PET/CT detected no FDG uptake (Figure 5).

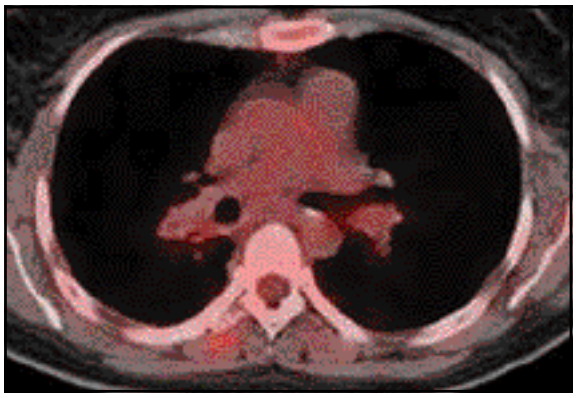

Figure 5. 18FDG-PET/CT after chemotherapy.

DISCUSSION

Pulmonary lymphom as cause difficulties in diagnosis with similar clinical and radiological signs imitating other pulmonary frequently seen disorders. Diagnosis may be delayed if invasive diagnostic methods have not been used.

Intrathoracic involvement is frequent in both Hodgkin's and non-Hodgkin lymphoma. The main localization is mediastinal lymphadenopathies. In HL, nodal involvement is usually by contiguity and usually localized at superior mediastinum. Pulmonary parenchymal disease occurs in 38% of HL (7). In HL, mediastinal lymphadenopathy with contiguous spread is a hallmark, and lung parenchymal involvement at the initial presentation is almost always associated with mediastinal lymphadenopathy (8). Anterior mediastinal, paratracheal and tracheobronchial lymph nodes are involved in almost all cases of HD with intrathoracic disease. In the large series by Filly and coworkers (3) all mediastinal lymph nodes were radiographically involved more frequently in patients with HD with the exception of the paracardiac and posterior mediastinal groups. Anterior mediastinal adenopathies were found in about 90% of patients with

HD showing intrathoracic localisation of the disease. Involvement of hilar nodes is the next most common site of disease in HD, occurring in up to 22% of patients with intrathoracic disease usually in association with mediastinal adenopathies (4).

The presence of multiple hilar and mediastinal lymph nodes in presented case point that the pulmonary involvement occurred by direct contiguity of lymph nodes.

Three distinct radiological patterns of pulmonary lymphoma are recognised: nodular, bronchovascular-lymphangitic and pneumonic-alveolar. Rarely lymphoma may be endobronchial. In untreated HD, parenchymal involvement is invariably associated with mediastinal lymphadenopathy and often with widespread disease (7). The presented case had a large cavitary pulmonary mass at the time of diagnosis. No non-invasive or invasive methods have been performed for four months that her symptoms had continued. As she had been diagnosed pneumonia with the radiological and clinical signs, she had been followed using antibiotics. So, there was a delay in diagnosis.

Diagnosis of intrathoracic lymphoma is by transbronchial or transthoracic biopsy or by needle aspiration of tissue or pleural fluid (7). CT guided trans thoracic needle aspiration biopsy revealed only a malignant undifferentiated tumor, not an exact histology. We could finally diagnose nodular sclerosing HL by excisional lymph node biopsy.

The addition of immunostaining improves the diagnostic yield in equivocal cases (7). Immunostaining and the presence of Reed-Sternberg cells confirmed the diagnosis in our case.

In patients who have lymphoma, the presenc e and distribution of thoracic involvement is important in both tumor staging and treatment (8). Presently CT is widely and successfully used in staging patients, whereas MRI seems to be preferable, as a second-step technique, if pericardial, pleural and chest wall involvement are suspected. The role of gallium scanning is limited in the staging, although it could be relevant in the follow-up of treated patients (2). In the series of Lewis et al. (9), who reviewed CT scans of 31 patients with untreated lymphomas, the most common finding (68%) was a mass or mass-like consolidation, up to 8 cm in diameter, with or without cavitation; air bronchogram was found in about 40% of cases. PET/CT detects more disease sites both above and below the diaphragm on staging of lymphoma than gallium. To use PET/CT in radiological follow is a new topic (10).

In this case thorax CT was helpful to exhibit the pulmonary mass and multiple mediastinal lymphadenopathies. Magnetic resonance imaging had not been preferred. When we had difficulty to confirm the diagnosis, 18FDG PET/CT helped us not only to exhibit the diffusiveness of the disease but also to see that we met a systemic disease with multiple localizations. With 18FDG PET/CT, it was also easy to decide which lymph nodes might be excised to confirm diagnosis and to have the stage of the Hodgkin Lymphoma.

Treatment and prognosis vary depending on cell-type, location and extent of disease (7). We met a significant improvement in clinical and radiological signs after chemotherapy.

Pulmonary lymphomas may mimic other pulmonary diseases with their similar clinical and radiological signs. When suspected, invasive diagnostic methods should be performed to achieve histological confirmation without no delay. 18FDG PET/CT is helpful to avoid delay in diagnosis as it reveal all

localizations of the disease and help clinicians to decide where excisional biopsy should be done. It also shows the dissemination of the disease.

REFERENCES

1. Cadranel J, Wislez M, Antoine M. Primary pulmonary lymphoma. Eur Respir J 2002; 20: 750-62.
2. Bonomo L, Ciccotosto C, Guidotti A, Merlino B, Storto ML. Staging of thoracic lymphoma by radiological imaging. Eur Radiol 1997; 7: 1179-89.
3. Filly R, Blank N, Castellino RA. Radiographic distribution of intrathoracic disease in previously untreated patients with Hodgkin's disease and non-Hodgkin's lymphoma. Radiology 1976; 120: 277-81.
4. Castellino RA, Blank N, Hoppe RT, Cho C. Hodgkin disease: contributions of chest CT in the initial staging evaluation. Radiology 1986; 160: 603-5.
5. Erbaycu AE, Karasu I, Özdemirkıran FG, Yücel N, Özsöz A, Bilgir O. Endobronchial low-grade MALT lymphoma causing unilateral hypertranslucency. Monaldi Arch Chest Dis 2004; 61: 237-40.
6. Sirmali M, Kalaç N, Ağaçkiran Y, Kaya S. Primary pulmonary lymphoma disguised as asthma. Acta Chir Belg 2006; 106: 127-9.
7. Berkman N, Breuer R, Kramer MR, Polliack A. Pulmonary involvement in lymphoma. Leuk Lymphoma. 1996; 20: 229-37.
8. Bae YA, Lee KS. Cross-sectional evaluation of thoracic lymphoma. Radiol Clin North Am 2008; 46: 253-64.
9. Lewis ER, Caskey CI, Fishman EK. Lymphoma of the lung: CT findings in 31 patients. AJR 1991; 156: 711-4.
10. Friedberg JW, Chengazi V. PET scans in the staging of lymphoma: Current status. The Oncologist 2003; 8: 438-47.

Corresponding Author:

Dr. Ahmet Emin ERBAYCU
Dr. Suat Seren Göğüs Hastalıkları ve
Göğüs Cerrahisi Eğitim ve Araştırma Hastanesi,
Göğüs Hastalıkları, İZMİR
e-posta: drerbaycu@yahoo.com