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Chronic Lymphocytic Leukemıa Hospitalized Due To Pleural Effusion - A Case Report

Plevral Efüzyon Nedeniyle Hospitalize Edilen Kronik Lenfositik Lösemi - Olgu Sunumu

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Abstract

Objective: Malignant pleural effusion was detected in 15% of patients who died of malignancy. Chronic lymphocytic leukemia is the most common leukemia in adults. In this case, we aimed to elucidate the importance of pleural biopsy fluid cytology, biochemistry, and imaging.
Case: A 58-year-old male patient with a diagnosis of chronic lymphocytic leukemia was admitted to our institution with complaints of dyspnea and hypoxia. At the time of admission, the patient complained of dyspnea and hypoxia, and evacuatory thoracentesis was performed in order to relieve her symptoms. Fluid biochemistry was exudate, and pathology was benign. Tube thoracostomy was applied upon the recurrence of the fluid. Thorax computerized tomography (CT) revealed no pathology except minimal effusion. Positron emission tomography scans (PET/CT) revealed a slightly increased 18 - Fludeoxyglucose (FDG – 18) uptake in the paramediastinal area. Two closed pleural biopsies were performed, and the result was reported as benign. Upon detection of a 5 cm solid, immobile mass on the right chest wall in control, an incisional biopsy was taken over the lesion. Chemotherapy (CT) and radiotherapy (RT) was initiated. The patient, who was followed up for 3 months for undiagnosed pleural effusion, died from a mass on the chest wall and 2 months after diagnosis of malignant mesothelioma.
Conclusion: In this case, we wanted to emphasize the importance of performing a large-scale open pleural biopsy with absolute vision in recurrent pleural effusions, where fluid cytology, biochemistry, and imaging methods can be misleading and increase the awareness of clinicians.

Keywords: Pleural Effusion, Chronic Lymphocytic Leukemia, Pleural Biopsy.

Özet

Amaç: Malignite nedeniyle ölen hastaların %15'inde malign plevral efüzyon saptanmaktadır. Kronik lenfositik lösemi, yetişkinlerde en sık görülen lösemidir. Bu olguda plevral biyopsi sıvı sitolojisinin, biyokimya ve görüntülemeye karşı önemini aydınlatmayı amaçladık.
Olgu: 58 yaşında kronik lenfositik lösemi tanılı erkek hasta nefes darlığı ve hipoksi şikâyeti ile kliniğimize başvurdu. Hastanın semptomlarını gidermek için boşaltıcı torasentez yapıldı. Sıvı biyokimyası eksudaydı ve patoloji iyi huyluydu. Sıvının tekrarlaması üzerine tüp torakostomi uygulandı. Toraks bilgisayarlı tomografisinde (BT) minimal efüzyon dışında patoloji saptanmadı. Pozitron emisyon tomografi taramaları (PET/CT) paramediastinal bölgede hafifçe artmış 18- Fludeoxyglucose (FDG – 18) alımını ortaya çıkardı. İki adet kapalı plevra biyopsisi yapıldı ve sonuç benign olarak bildirildi. Kontrolde sağ göğüs duvarında 5 cm'lik solid, immobil kitle saptanması üzerine lezyon üzerinden insizyonel biyopsi alındı. Kemoterapi (CT) ve radyoterapi (RT) başlandı. Teşhis konulamamış plevral efüzyon nedeniyle 3 aydır izlenen hasta, malign mezotelyoma tanısı aldıktan 2 ay sonra göğüs duvarındaki kitle nedeniyle kaybedildi.
Sonuç: Bu vakada sıvı sitolojisi, biyokimyası ve görüntüleme yöntemlerinin yanıltıcı olabileceği ve klinisyenlerin farkındalığını artırabileceği tekrarlayan plevral efüzyonlarda mutlak görüş ile geniş çaplı açık plevral biyopsi yapılmasının önemini vurgulamak istedik.

Anahtar Kelimeler: Plevral Efüzyon, Kronik Lenfositik Lösemi, Plevral Biyopsi.

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INTRODUCTION

Malignant pleural effusion (MPE), defined by malignant cells in the pleural fluid or parietal pleura, is seen during many malignancies. Malignant pleural effusion was detected in 15% of patients who died of malignancy. Although it usually develops after the diagnosis of cancer, it can sometimes be the first sign of tumor spread or recurrence. MPE often occurs in advanced patients and is associated with a poor prognosis. Therefore, the main purpose of treatment today is palliation. It has been shown that early mortality is higher in tumors with high malignancy risk, low Karnofsky performance score, low pleural pH, and glucose value. Depending on the stage and type of the underlying malignancy, the median survival after diagnosis ranges from 3 to 12 months (1).

Chronic lymphocytic leukemia (CLL), the most common leukemia in adults, occurs with the accumulation of mature-appearing malignant monoclonal B cells in the bone marrow, peripheral blood, or lymph node. CLL's clinical spectrum and course are very variable, with 1/3 of the cases living for more than 20 years and not requiring treatment, while 3 – 10% of them develop an aggressive 'Richter transformation'. The most common finding in physical examination is lymphadenopathy (LAP); splenomegaly and hepatomegaly can also be seen (2). CLL can involve many non-lymphoid organs. Thoracic complications are common in hospitalized patients with CLL, but data on the specific etiology and incidence are limited (3). Because of CLL's involvement, pleural, parenchymal, and airway disease may occur, as well as side effects from therapeutic agents, infections from typical or opportunistic organisms, or existing comorbidities. In early-stage asymptomatic patients, observation and 3-month follow-up are recommended instead of initiating treatment immediately. Moderate-risk (Rai Stage I and II) patients and high-risk patients (Rai Stage III and IV) or Binet Stage B and C patients benefit from treatment (4).

Pleural effusion may cause symptoms such as dyspnea, cough, and chest pain and may accompany fever and vena cava superior syndrome. Fluid may cause blunting in the costophrenic sinus on chest X-ray, which does not cause any symptoms, or it may appear as a homogeneous density covering the entire hemithorax with severe respiratory distress. In some cases, PE may be the first sign of malignancy. Thoracentesis is always necessary for the differential diagnosis of pleural effusion (PE) in patients with hematological malignancies unless the fluid is very low. Its appearance may be serous, serous, chylous, or hemorrhagic if pleural involvement is present (5).

CASE

A 58-year-old male patient with a diagnosis of chronic lymphocytic leukemia was admitted to our institution with complaints of dyspnea and hypoxia. A chest X-ray was performed in a different healthcare facility and referred to us after detecting pleural effusion in the right pulmonary lobe. At the time of admission, the patient complained of dyspnea and hypoxia, and evacuatory thoracentesis was performed in order to relieve her symptoms.

Fluid biochemistry was exudate, and pathology was benign. Tube thoracostomy was applied upon the recurrence of the fluid. The general condition of the patient was moderate. Thorax

computerized tomography (CT) revealed no pathology except minimal effusion. positron emission tomography scans (PET/CT) taken upon the recurrence of the fluid revealed a slightly increased 18 - Fludeoxyglucose (FDG – 18) uptake in the paramediastinal area of the right lung in the areas of pleural thickening compared to the surrounding tissue.

SUV max was 1.8, and surgery was considered high risk in the patient whose general condition was moderate, low effort capacity, and severe anemia. Two closed pleural biopsies were performed and the result was reported as benign. Daily drainage decreased in the patient who underwent talc pleurodesis 3 times, but it did not end. The patient was discharged with a Heimlich valve and was followed up with a drain for 45 days. Upon detection of a 5 cm solid, immobile mass on the right chest wall in control, an incisional biopsy was taken over the lesion. The oncology clinic consulted the patient, whose pathology result was malignant epithelial mesothelioma. Chemotherapy (CT) and radiotherapy (RT) was initiated.

The patient, who was followed up for 3 months for undiagnosed pleural effusion, died from a mass on the chest wall and 2 months after diagnosis of malignant mesothelioma.

DISCUSSION

Thoracic complications in CLL can be examined under 3 headings: 1) Infectious complications that are directly related to the severity of leukemia or immunodeficiency secondary to treatment, 2) Pleural pleural effusion caused by a mass or lymph node related to the localization of CLL, or due to venous or lymphatic compression. Effusions, and 3) bronchopulmonary involvement secondary to lymphocytic infiltration (6). Specific bronchopulmonary involvement due to CLL, known as bronchopulmonary pathological leukemic infiltration (BPLI), is rare; few cases have been reported in the literature. Although pneumonia is the most common thoracic complication in patients with CLL, non-infectious complications are also common. In approximately 3/4 of the cases with CLL, marked neutropenia, cellular immunity defects, and infectious complications due to immunosuppressive therapy occur during the course of the disease (7). A lung biopsy is required to reveal other forms of non-infectious parenchyma involvement in the presence of pneumonic infiltration with delayed resolution. Leukemic pleural effusion and 'Richter's syndrome' are other common thoracic involvements after pneumonia. The progression of CLL may occur as BPLI. In a series in which 2602 cases with CLL were evaluated, thoracic complications were found in 409 cases and it was reported that pneumonia was observed in 62.8%, pleural effusion with a frequency of 31.8%, and lung cancer with a frequency of 6.9%, while BPLI was observed in 5.9% of cases (8).

In another study, direct lung or pleural involvement with leukemic cells (9%) was found to be the second most common complication after pneumonia (9). Autopsy studies, on the other hand, report up to 40% lung involvement with leukemic cells in patients with CLL. However, leukemic cell infiltrates in most patients are clinically insignificant (10,11).

Multiple bilateral mediastinal LAP, mosaic perfusion, expiratory air trapping, budding tree view with centrilobular micronodules, centrilobular ground glass opacities, or homogeneous parenchymal consolidation can be observed on thorax CT. The diagnosis should be based on

bronchoalveolar lavage fluid (BAL), immunophenotype studies, and transbronchial or surgical lung biopsy accompanied by imaging (12).

Pulmonary involvement in CLL can occur in various ways, primarily in patients with advanced disease who have a previous treatment history for CLL. Infectious causes should be excluded in cases. It has been reported that there is no correlation between pulmonary leukemic infiltrates and peripheral blood absolute lymphocyte counts (13). In the series of Carmier et al., progressive lymphocytosis (median 27.2x10 9 cells), bilateral axillary, inguinal LAP, mediastinal LAP, and lymphocytic pulmonary infiltrate have been observed in all cases (14). High lymphocyte counts have been reported in cases with high rations. In general, an intense B-CLL infiltration with peribronchial and perivascular distribution is detected in pulmonary biopsies. Specific leukemic infiltration with CLL actually indicates true extranodal tissue involvement, not a non-specific "temporary effect" secondary to increased permeability due to continued inflammation and host response (13). Combined chemotherapy is recommended for CLL according to the severity of pleural effusion. In the presence of respiratory symptoms, specific therapy should be administered regardless of the extent of the peripheral blood lymphocyte count. Antineoplastic therapy is an appropriate treatment approach when BPLI is diagnosed, especially when infection is excluded (15).

Thoracentesis is the first interventional approach in a patient with an unspecified effusion. Despite the improvements in the diagnostic accuracy of imaging methods, cytology or tissue sample examination is required to confirm the diagnosis of MPE. Initial thoracentesis is diagnostic as well as therapeutic, as most MPE patients are dyspneic. Pleural fluid should be sent for cell count, total protein, lactate dehydrogenase (LDH), glucose, amylase, pH, and cytology. At least 50 mL of fluid sample should be obtained for cytological evaluations (15).

The efficiency of cytological examination in the diagnosis of MPE is variable. Although it reaches 60%, especially in the diagnosis of metastatic adenocarcinoma, it is unfortunately at a low rate of approximately 20% in the diagnosis of mesothelioma. This is because it is difficult to distinguish between normal, reactive, and malignant mesothelial cells. However, this rate may increase to 70% in advanced mesotheliomas with visceral pleural involvement (15).

Although it has been reported that the diagnostic value increases with repeated thoracentesis, the next diagnostic procedure after the first or second negative cytology should be thoracoscopic, which has a sensitivity of 90%. Positive standard pleural cytology may not differentiate between pleural adenocarcinoma, mesothelioma, lymphoma, or reactive lymphocytosis (15).

The treatment of malignant pleural effusion depends on the etiology of the effusion, lung reexpansion, general condition of the patient, symptoms, and life expectancy. With systemic therapy, MPE can be controlled in lymphoma, breast, prostate, ovarian, thyroid cancer, small cell lung cancer, and germ cell tumors. Radiotherapy may be beneficial in mediastinal lymph node involvement. The main goal in the treatment of patients with malignant pleural effusion should be to improve the patient's symptoms with minimal hospitalization and complications. Unfortunately, many patients do not respond to systemic therapy, so other treatment

modalities must be considered. Today, thoracentesis, pleural catheter/pigtail catheter insertion, chest tube, and pleurodesis are used to treat symptomatic MPE (15).

CONCLUSION

In this case, we wanted to emphasize the importance of performing a large-scale open pleural biopsy with absolute vision in recurrent pleural effusions, where fluid cytology, biochemistry, and imaging methods can be misleading and increase the awareness of clinicians.

Abbreviations

BAL : Bronchoalveolar lavage
BPLI : Bronchopulmonary pathological leukemic infiltration
CLL : Chronic lymphocytic leukemia
CT : Chemotherapy
CT : Computerized tomography
FDG – 18 :18 - Fludeoxyglucose
LAP : Lymphadenopathy
LDH : Lactate dehydrogenase
MPE : Malignant pleural effusion
PE : Pleural effusion
PET/CT : Positron emission tomography
RT : Radiotherapy
SUV max : Standardized uptake value

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Ethical Declaration: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from our institution.

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