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Case report

Chylothorax due to leukemic infiltration in a patient with chronic lymphocytic leukemia

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ABSTRACT

Chylothorax is characterized by accumulation of milky fluid called chyle into the plural space. Most common causes of chylothorax are trauma or surgery of thoracic duct and malignancies. Among the malignancies lymphoma is responsible approximately 70% of chylothorax but other lymphocytic tumors including chronic lymphocytic leukemia (CLL) is rarely reported. A 71 years old man with known CLL, presented with dyspnea and pleural effusion and diagnosed chylothorax due to leukemic infiltration that confirmed by immuno flow cytometric analyse.

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1. Introduction

Chylothorax is characterized by lymphatic fluid that enriched with fat and its digestive products absorbed by the intestinal epithelium, called chyle, into the pleural space [1]. The leakage of chyle into the pleural space is the main mechanism underlying chylothorax and is usually due to thoracic duct disruption [1,2]. A triglyceride levels of >110 mg/dl or presence of chylomicrons [1,2]. Thoracic surgery that includes dissection of the mediastinum is the most frequent cause of chylothorax [1]. Malignant obstruction of the thoracic duct is the most frequent cause of nontraumatic chylothorax. Lymphoma is the most common cause of neoplastic etiologies of chylothorax (70% of cases) [1]. Chronic lymphocytic leukemia (CLL) is an indolent type of B-cell non-Hodgkin's lymphoma that can be found in the bone marrow and blood, or predominantly in lymph nodes [3]. Pleural effusion occurs commonly in non-Hodgkin's lymphoma, but is less often in CLL [7]. Here, we present a case of chylothorax in a patient with CLL which was diagnosed by immunoflow cytometric analyses.

2. Case report

A 71 years old, man presented with dyspnea which had been increased for a few month. Patient declined chest pain, hemoptysis and cough. The patient's history revealed that, he had diagnosed B-cell CLL 7 years ago and still being treated with *fludarabine* with the diagnosis of a stage 3–4 CLL. He had received last chemotherapy one month ago before the hospital admission. Physical examination revealed body temperature: 36.8 °C, heart rate: 88/bpm, tension arterial: 110/70 mmHg and saturation O₂:88%. There was no breath sound at right lung basillaries on auscultation. Chest radiography revealed homogen density at right lower zone. Complete blood count analyses revealed white blood count:5.200/10³ u/L, haemoglobin: 9.9 g/dL, platelet count: 135.000/10³ u/L, absolute neutrophil count:2.500 10³/uL (55%), and lymphocyte count: 1.700 10³/uL (32%). Moderate pleural effusion was detected on contrast enhanced thorax computed tomography (Fig. 1).

Diagnostic thoracentesis was performed and a white, milky, fluid was aspirated. Laktate dehydrogenase: 363 U/L and 504 U/L, total protein: 5.2 g/dL and 7.1 g/dL, triglyceride 575 mg/dL and 32 mg/dL, total cholesterol: 62 mg/dL and 110 mg/dL were found in pleural fluid and serum, respectively. The pleural fluid was exudative and chylothorax was diagnosed. Nil by mouth, central venous catheterization and total parenteral nutrition was administered. Chest tube drainage was performed. Cytologic analyses showed no atypical or malignant cells. Acide fast bacilli was negative. Repeated flow cytometric analyses were appropriate with B-cell CLL in both of blood and pleural fluid (Table 1).

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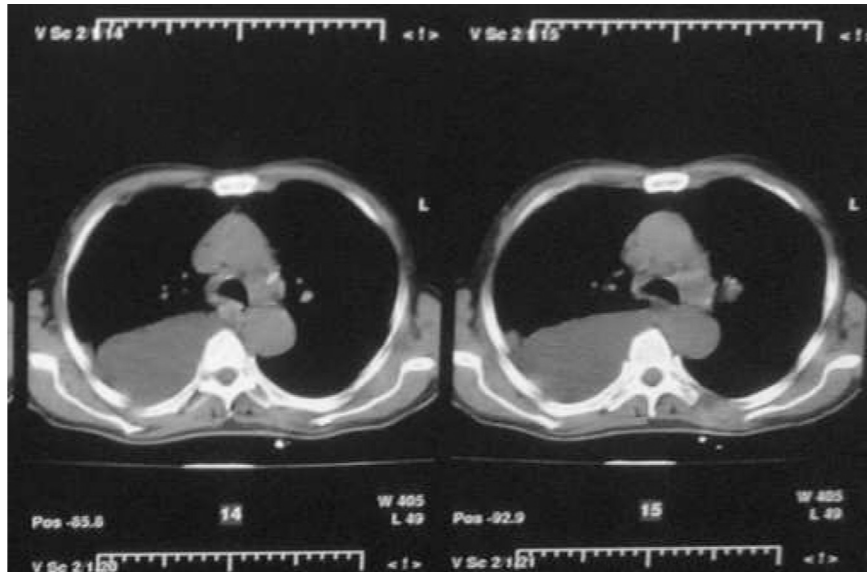


Fig. 1. Thorax computed tomography shows moderate pleural effusion on right hemithorax and there is no enlarged lymph node in mediastene.

Table 1
Flow cytometric analyses of the patient's blood and pleural fluid.

	Blood	Pleural fluid
CD3	23.7%	88.9%
CD5+CD19–	24.1%	89.1%
CD4	11.5%	72.3%
CD8	15.0%	15.3%
CD4+CD8+	0.1%	0.2%
CD19	69.7%	9.5%
CD5+CD19+	69.1%	9.2%
CD20	57.9%	5.4%
CD22	68.8%	7.2%
CD20 + 22	57.3%	4.2%
CD23	37.3%	3.4%
HLA-DR	76.6%	17.3%
CD34	0.3%	Negative
CD11c	29.5%	4.9%

Cylothorax was considered to leukemic infiltration and new chemotherapy regimen was started. Talk pleurodesis was performed after daily fluid drainage decreased 50 mg/day and chest tube was removed. But the patient had poor prognosis and died 6 months later despite new chemotherapy regimen was administered.

3. Discussion

The chyle is a bacteriostatic, nonirritating, milky fluid, which is transported by thoracic duct into the systemic venous system from intestines, liver, and lower extremities [1,2]. Obstruction or trauma of thoracic duct lead to leakage of chyle into the pleural spaces [1]. The etiology of chylothorax has been divided into four major categories: tumor, trauma, idiopathic and miscellaneous [4]. Dyspnea and chest discomfort are the main symptoms in patients with chylothorax. Differently from other pleural effusions, pleuritic chest pain and fever are uncommon because of chyle is not irritating to the pleural surfaces [1]. The sole symptom in our patient was dispnea and the patient declined chest pain and fever.

Lymphoma is the most common cause of malignancy associated chylothorax in adult patients, for over 70–75% of cases [1,3]. Other

lymphocytic tumors, including CLL, are rarely reported [4]. In a retrospective study [5], Teng et al. investigated 88 patients with chylothorax and found that 18 (20%) were malignancy associated. Among malignancy associated chylothorax 11 were lymphoma (6 of 11 had no mediastinal involvement) and 7 were solid malignancy [5]. Diagnosis of chylothorax is confirmed when the chylomicrons are found in pleural fluid or the triglyceride levels are >110 mg/dL in the pleural fluid [3]. A triglyceride level between 55 and 110 mg/dl requires a lipoprotein analysis to detect chylomicrons [1]. In our patient a milky, exudative fluid was aspirated and triglyceride level was determined as 575 mg/dL, thus the diagnosis of was chylothorax was confirmed.

Pleural effusions may be the first presentation of a hematologic malignancy or may develop during the course of the disease [6]. In patients with non-Hodgkin lymphoma and Hodgkin disease pleural effusions are reported with a frequency of 20% and 30%, respectively [6]. In patients with malignancy, chylous pleural effusions are usually associated with damage of the thoracic duct and related lymphatic channels of the thorax, neck, and abdomen [7]. CLL usually involves the peripheral blood and bone marrow but involvement of the thorax, consisting of pulmonary infiltrates and pleural effusion, rarely occur [2]. In pleural effusions due to infiltration of CLL, the fluid may be hemorrhagic and contains numerous predominantly B cell lymphocytes [8]. The differential diagnosis of pleural effusion in a patient with CLL includes infection, pleural involvement and lymphatic obstruction. Immunophenotyping of chyle may have limited value in diagnosing chylothorax in CLL patients [8]. Positivity of cell surface markers including CD3, CD5, CD19, CD20, CD23, and sometimes CD43 are useful for CLL [2]. In our patient there was no enlarged lymphadenopathy that lead to obstruction of thoracic duct and no evidence of infection. Thus we used the flow cytometric analyse of pleural fluid to confirm that the chylothorax in our patients was associated with leukemic infiltration. The result of the flow cytometric analyse was appropriate with B-cell CLL (The surface marker identical for CLL including CD3, CD5, CD4, CD8 and CD19 were detected positive in pleural fluid).

Patients with pleural involvement by CLL usually have a long-standing diagnosis of CLL and thus they may have a limited

prognosis [6,7]. But the patients who had either successful thoracic duct ligation, mediastinal irradiation or pleurodesis were reported longer survival [6]. Our patient developed chylothorax 7th years of disease course and despite successful treatment and pleurodesis, he had a poor prognosis and died 6 months after chylothorax developed.

Management of chylothorax should include aggressive nutritional support to reverse hypovolaemia, immunosuppression, and protein and electrolyte deficiencies. In the presence of large chylothoraces that lead to respiratory distress therapeutic thoracentesis preferably intercostal chest tube drainage should be performed initially. Low fatty diet or nil by mouth are advised in the presence of extensive leakage of chyle. Total parenteral nutrition is indicated in the presence of chronic chylothorax or rapid loss of nutrients into the pleural space [1]. In our patient, intercostal tube drainage was preferred and total parenteral nutrition via central venous catheterization and nil by mouth administered.

Chylothorax rarely occurs during the late course of CLL. Flow cytometric analyse may have limited value in detecting leukemic infiltration of pleural fluid.

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