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An Early Lupus Pleuritis With Large Pleural Effusion Due to Systemic Lupus Erythematosus in a 17-Year-Old Girl

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ABSTRACT

Systemic Lupus Erythematosus (SLE) known as "lupus" is an autoimmune disease that mostly affects women. In this disorder, the body's immune system attacks different tissues. Manifestations and symptoms vary among individuals from mild to severe. One of the most common manifestations of lupus is pleuritis with pleural effusion; however, its manifestation as the initial symptom of the disease is remarkably rare. Herein, we present a 17-year-old female with SLE, which was diagnosed with early pleural effusion regarding rheumatologic counseling subjected to treatment.

Introduction

Systemic Lupus Erythematosus (SLE) is an autoimmune disorder that can affect almost any part of the body. According to the diagnostic criteria of the American College of Rheumatology, this disorder mostly affects females, especially young and middle-aged women [1]. Pleuropulmonary involvement is one of the most common manifestations of SLE. It may appear as pleuritis with or without pleural effusion [2]. Nearly 50% of SLE patients are reported with pleural effusions in clinical manifestation and up to 93% after autopsy [3].

Plural effusion as the only clinical manifestation with SLE has been reported in only 5% of cases [4]. Diagno-

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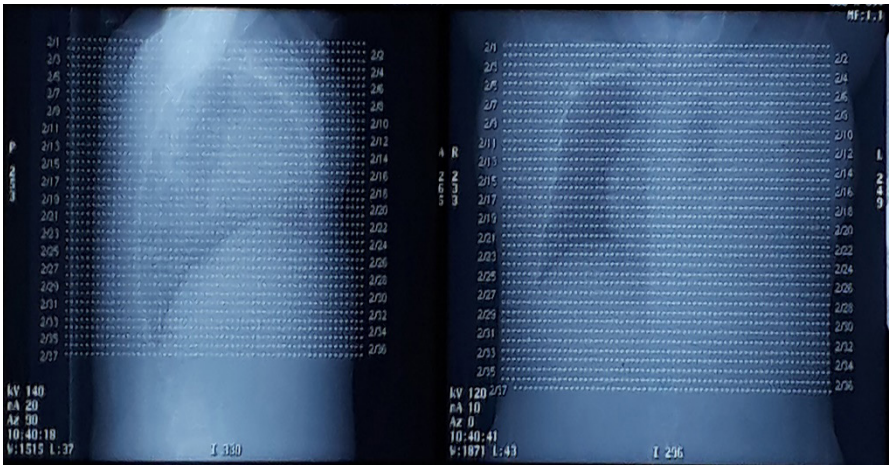

Figure 1. Initial chest radiography indicating a massive left-sided pleural effusion

sis of early pleural effusion is difficult due to the non-specific clinical characteristics [5]. Herein, we report a 17-year-old female with SLE, who was presented with early pleural effusion.

Case Presentation

On May 9, 2018, a 17-year-old female referred to the Internal Ward of Imam Khomeini Hospital of Sari City in Mazandaran Province of Iran and complained of dyspnea and dry cough since 15 days before admission. Besides, she mentioned the loss of appetite, weight loss, night sweats, nausea, migratory arthritis (from 5 months ago), and hives history. She was hospitalized and initial chest radiography indicated the left massive pleural effusion (Figure 1). Computed Tomography (CT) showed the progression of pleural effusion (Figure 2).

Besides, regarding the suspicion of Mycobacterium tuberculosis infection, a serosanguinous fluid pleural biopsy was aspirated and sent to the laboratory for cytopathology evaluation. According to microscopic analysis, sections from pleural biopsy revealed a dense fibrotic background with moderate lymphocytic infiltration, and the focus of fibrin deposition granuloma was not seen. Finally, only fibrinous fibrotic pleuritis was diagnosed with no definite granuloma and no vasculitis.

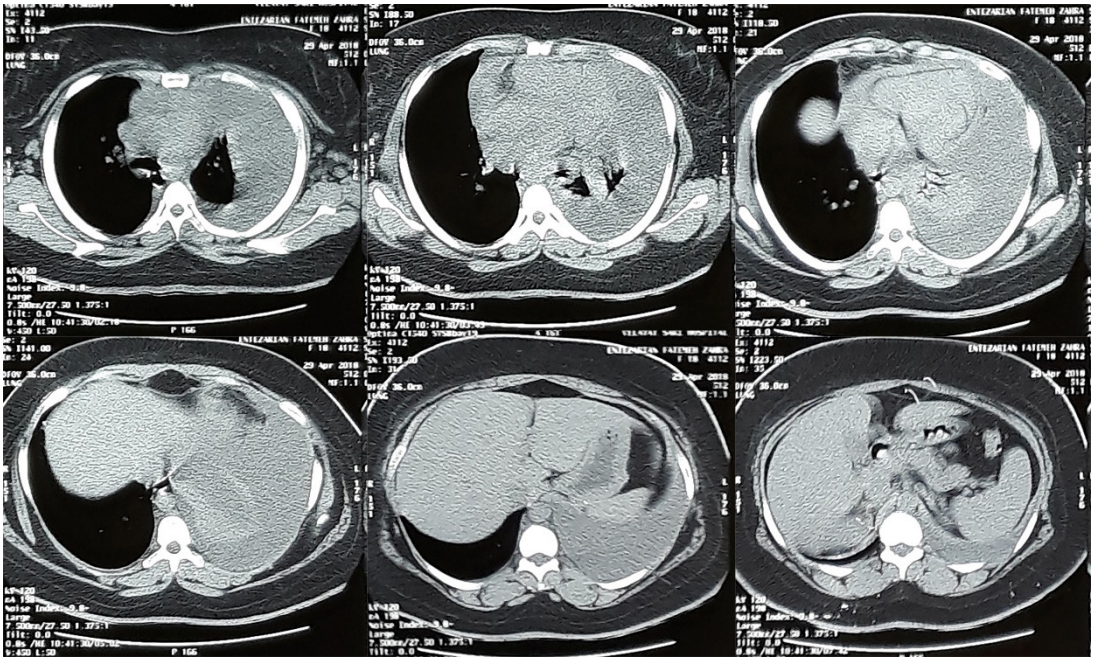

Figure 2. CT scan of the chest demonstrating the left-sided massive pleural effusion and its progression to the right side

Table 1. Summary of laboratory findings

Indexes	Status	Patient's Results	Normal Values
WBC count, $\times 10^3/\mu L$		8.8	4.5-11
RBC count, $\times 10^6/\mu L$		3.93	3.8-5.5
Hemoglobin, g/dL	Low	9.6	11.7-16
HCT, %	Low	31.5	35-47
ESR, mm/h	High	46	4-20
MCV, FL		80	80-99
MCH, Pg	Low	24	27-35
MCHC, g/dl	Low	30	32-37
Platelet count, $\times 10^3/\mu L$	High	408	130-400
RDW-CV, %	High	16.8	10.6-15.7
PDW, FL		13.2	9-17
PMV, FL		11.4	9-13
Total reticulocyte, %		1.5	0.5-1.5
Corrected reticulocyte, %		1.1	0.5-1.5
Direct combs		Negative	
Indirect combs		Negative	
RPI		0.75	
Complement C3, mg/dL		176	90-180
Complement C4, mg/dL	Low	7	10-40
LDH, IU/L		316	< 1100
Total protein, mg/dL	High	8.5	6.4-8.3
Calcium, mg/dL		10	8.5-10.5
Phosphorus, mg/dL	High	5	2.5-4.8
CRP, mg/dL	High	66.6	Up to 6
Na, mEq/L		142	135-145
K, mEq/L		4.5	3.5-5.5
Lupus anticoagulant		42	30-45
Serum ANA, ratio	High	4.2, Positive	Negative
Anti-ds DNA, IU/mL	High	467, Positive	Negative
Anti-CCP, RU/mL		Negative	Negative

Indexes	Status	Patient's Results	Normal Values
Anti-cardio G, GPL/mL		Negative	Negative
Anti-cardio M, MPL/mL		Negative	Negative
Anti-Smith Ab, RU/mL		1.7	Up to 20
Anti-tissue transglutaminase (IgG), U/mL		Negative	Negative
Urine creatinine 24 h, g/24 h		0.9	0.6-1.8
Urine volume 24 h, mL/24 h		1000	800-2000
Urine protein 24 h, mg/24 h	High	245	24-141
Pleural fluid analysis			
Total protein, mg/dL		5.3	
Glucose, mg/dL		83	
LDH, IU/L		330	
RBC count, $\times 10^6$/µL		1000	
WBC count, $\times 10^3$/µL		160	
Neutrophils, %		15	
Lymphocytes, %		85	
ADA		25.4	Serum: Up to 15 CSF: Up to 9 Other Fluids: Up to 30
Triglyceride, mg/dL		51	<200
Cholesterol, mg/dL		104	<200
ANA, ratio	High	3.8, Positive	Negative

Ziehl-Neelsen staining failed to show Mycobacterium. Moreover, preparing of Polymerase Chain Reaction (PCR) test using hot start PCR using specific primers and fluorescent probe with detect limitation of 2×10 copies of DNA/mL and 97% of sensitivity failed to detect M. tuberculosis DNA. Pleural fluid was exudative with 8.5 g/dL total protein and an ADA level of 25.4. Also, echocardiography results were normal.

Regarding the order of the rheumatology unit, ANA was positive in both pleural fluid (3.8) and serum samples (4.21). In addition, serum anti–dsDNA was positive at the level of 467 IU/mL. C3 level was normal and C4 was low. Eventually, regarding rheumatologic counseling, the diagnosis of SLE was made for the patient and subjected to treatment. Table 1 presents different indexes through the analysis.

According to the final decision, after successful treatment and stability of clinical condition, she was discharged from the hospital and followed by azoran (50 mg/d), prednisolone (10 mg two times a day), hydroxychloroquine (200 mg two times a day), and folic acid (5 mg/d). After about 2 months of follow-up, the patient was in a healthy clinical condition and she was still under monitoring.

Final Diagnosis: Early lupus pleuritis with pleural effusion due to SLE.

Discussion

Systemic lupus erythematosus is a chronic inflammatory autoimmune disorder that affects females more than males and it mostly occurs between 15 to 50 years

of age. Pleuritis with or without pleural effusion is one of the most common manifestations of SLE, but it is pretty rare as an early presentation [6, 7].

According to previous reports of lupus pleuritis [8], pleural effusion mostly tends to be bilateral and small to medium in size. However, in our patient, Computed Tomography (CT) scan showed the unilateral left massive pleural effusion.

The cases with unknown etiology of exudative pleural effusion should be considered as the lupus pleuritis. Therefore, one of the approaches is to exclude the chance of Tuberculosis (TB) pleuritis, especially in endemic regions. This possibility was checked at the first stage of our diagnostic process by Ziehl-Neelsen staining and microscopic examination as well as preparation of the PCR test that both were negative.

Regarding the differentiation of lupus pleuritis and TB pleuritis, both have some overlaps regarding clinical manifestations and laboratory findings of pleural fluid. According to Palavutitotai et al., the duration of the disease, body temperature, cough, pain on the chest and relapses, pleural ADA level, and disease activity can help for the differential diagnosis of these two disorders [9].

Furthermore, in SLE, exudative pleural fluid is common, with the majority of lymphocytes, neutrophils, and glucose [5, 8], which was observed in the pleural fluid of this young girl.

About the prognosis of this disorder, approximately 94% of patients have a full response to steroids and NSAIDs. Besides, only about 13% of cases of lupus pleuritis may relapse. Therefore, the prognosis of this disease is generally good [10].

Conclusion

Pulmonary manifestations are common in SLE, but its early appearance due to SLE is a challenging issue for physicians. Early diagnosis of pleuritis with pleural effusion is necessary to begin the treatment and requires a differential diagnosis between TB pleuritis and lupus pleuritis. A comparison of ANA titer in both pleural fluid and serum is essential for an accurate diagnosis.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles are considered in this article.

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Conflict of interest

The authors declared no conflict of interest.

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