

# A case report: Pulmonary involvement in rheumatoid arthritis

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## Abstract

57 years old male patient, due to the increase in 15 years follow-up of RA patients under cyclosporine therapy because of complaints by the rheumatology clinic patients considered as appropriate to launch abatement was directed to us by the patient isoniazid prophylaxis. A pleural effusion was diagnosed on chest X-ray. The patient was accompanied by thoracentesis on USG. The pleural effusions were exudative. Tracking of fever, cough, sputum complaint and low acute phase reactants excluded empyema. ADA levels were under 70, and TB pleurisy was excluded by the lack of growth in ARB and culture results. The lung involvement of RA was suspected without interstitial lung disease.

Rheumatoid arthritis with interstitial lung disease is the commonest form of lung involvement; the incidence of pleural effusion and nodular lesions in the form is less common. Although pleural effusion has been reported before it was thought be caused by the new biological agents for treatment of rheumatoid arthritis.

**Keywords:** Rheumatoid Arthritis; Pulmonary Involvement; Pleural Fluid; Nodular Infiltration.

## INTRODUCTION

Rheumatoid arthritis (RA) is a systemic disease characterized by symmetric polyarticular joint involvement. The incidence of the disease in our country is 0.49% and involvement of the lung, according to the prevalence, occurs as nodular, pleural and interstitial pulmonary disease. In RA cases, pleural involvement and pleural effusion were reported 40-70% and 3-5% in autopsy studies, respectively. Almost all of the pleural effusion cases related to RA are aged over 35 and typically pleural effusion presents a couple of years later than arthritis (1).

## CASE REPORT

A 57 years old male patient followed up for RA for 15 years has had methotrexate and sulphasalazine treatment in the past. The patient experienced increase in complaints during sulphasalazine treatment and Rheumatology Polyclinic administered abatement and the patient was consulted with Pulmonology Polyclinic for isoniazid prophylaxis.

Tuberculin skin test (TST) performed on the patient which

was 8 mm and the patient was administered isoniazid prophylaxis. The patient started to use Abatement in the fifth week of the prophylaxis. After 3 months of treatment, the treatment of the patient was changed to adalimumab.

The patient admitted to our polyclinic while under treatment to sign medication security form. Physical examination of the patient revealed bilaterally decreased respiratory sounds. Posterior-Anterior (PA) chest X-ray was performed to the patient. Density increase with upward facing concavity in the bilateral lower zones was detected (Figure 1).

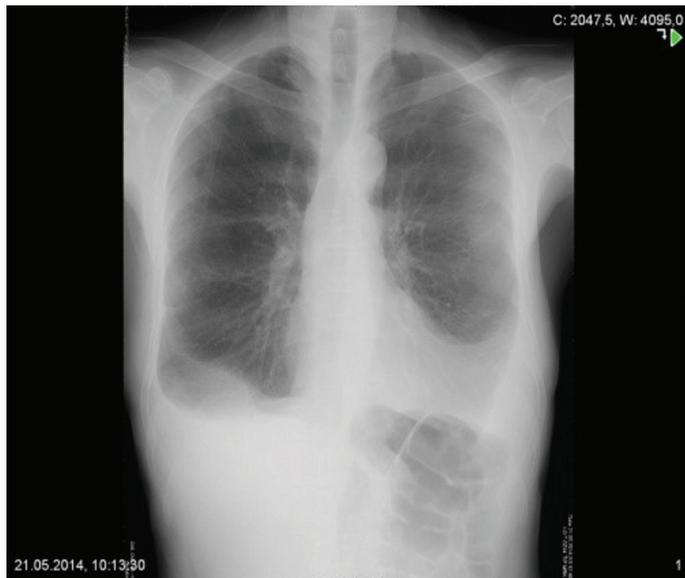
Thorax computer tomography (CT) revealed pleural effusion with the 3.5 cm deepness in the deepest area in both lungs as well as 5 mm subpleural nodular lesion in the left lung apico-posterior segment region and multiple lesions, the biggest one is 5 mm in the both lungs posterobasal region (Figure 2,3).

Ultrasound guided thoracentesis was performed to the patient. The patient was hospitalized for further investigation of the exudative character of the thoracentesis sample. Bilateral simultaneous thoracentesis was performed on

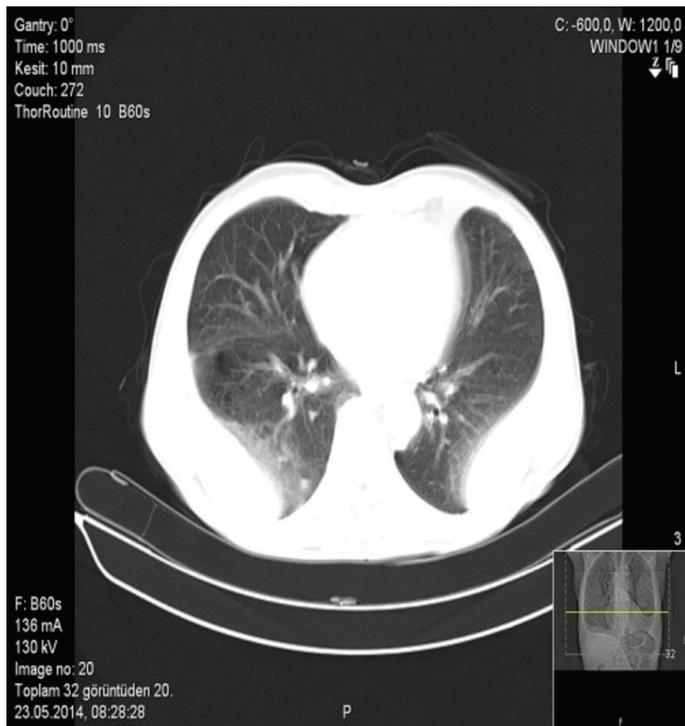
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the patient with a differential diagnosis of RA pulmonary involvement, tuberculosis pleurisy and empyema. Thoracentesis revealed glucose <5mg/dl, protein 9,2gr/dl, albumin 2,5gr/dl, LDH >1995 U/l, ADA 63.9U/l in the right pleural fluid and glucose <5mg/dl, protein 7,7gr/dl, albumin 2,4gr/dl, LDH 6561 U/l, ADA 59,8 U/l in the left pleural fluid. ADA levels below 70 U/L, no proliferation in tuberculosis culture and negative AFB result ruled out tuberculosis pleurisy. Pulmonary involvement of RA was considered.



**Figure 1.** Bilateral pleural effusion, with left side being affected more



**Figure 2.** Nodular lesion and bilateral pleural effusion in the right lung lower lobe



**Figure 3.** Bilateral localized pleural effusion

## DISCUSSIONS

The incidence of RA is higher in female patients whereas the pulmonary involvement is higher in male patients. In approximately 50% of the patients, pulmonary involvement is seen in any stage of the disease and it is the cause of death in 18% of the patients (2). Clinical presentation is generally silent in the beginning, and presents itself as progressive dyspnea and dry cough as the disease progresses. Effort dyspnea helps with diagnosis only in the latter stages of the disease as the effort of the patients would be limited by the joint problems. Physical examination reveals bibasilar crackles in lung auscultation. In contrast with idiopathic pulmonary fibrosis, clubbing is rare in RA-IPD (3). There is no active respiratory complaint in our patient. Respiratory function tests (RFT) might reveal 5-15% restrictive defect and 50% decrease in carbon monoxide diffusion capacity (DLCO). RFT was not performed in our patient as there would be limitations in the respiratory functions secondary to bilateral pleural effusion. Pleurisy, rheumatoid nodule, rheumatoid pneumoconiosis, interstitial pulmonary fibrosis, bronchiolitis obliterans organized pneumonia (BOOP), obliterating bronchiolitis, follicular bronchiolitis, bronchiectasis, vasculitis and lymphocytic interstitial pneumonia are the main pulmonary involvements of RA. Incidence of pleural effusion and nodular lesion is low (4,5) and it is known that the sampling from these fluids are of exudate character (6). Differential diagnosis of exudative pleural effusion with low pH, low glucose and high LDH includes bacterial empyema, tuberculosis, malignancy, paragonimiasis and rheumatoid pleurisy (6,7). RA related pleural effusion is expected to have low glucose (<20 mg/dL), complement levels, LDH levels of >1000 U/L and pH of <7.00 (7-12). Pleural fluid glucose to serum glucose rate was found below 0.5 in 80% of the RA patients (13). In our case, glucose level in the liquid is too low to measure. Pleural effusions and pleurisy might regress spontaneously or cause fibrosis (14,15). Pleural

effusion might develop secondary to medication use in these patients. Pulmonary pathologies are seen in 3-18% of the RA patients secondary to methotrexate (16,17). Eosinophilia is seen in pleural effusions secondary to medication use whereas RA related pleural effusion has mostly lymphocytosis, and neutrophil dominance in rare cases and chronic nonspecific inflammation and fibrosis are seen in pleural biopsy (4). Pleural effusion in our patient had lymphocyte dominance and the patient was not using methotrexate for a long time. Treatment options are repeated symptomatic effusion drainage, oral steroids and RA disease treatment. Effusion regresses in 4 weeks in 50% of the patients, but it may continue for years in 20% (3). Thoracentesis revealed LDH1995 U/l, ADA 63.9U/l in the right pleural fluid and LDH 1000 U/L and pH of 1000 and low glucose in thoracentesis fluid, gram staining and no proliferation in the cultures, and no fevers during the follow-up ruled out empyema and RA related pleural effusion was considered. The patient was directed to Rheumatology Polyclinic with RA pulmonary involvement diagnosis. RA related effusion is called sterile emphysematous pleural fluid, because of no proliferation in the cultures despite the pus colored appearance of the effusion (13). 74% of 10.434 patients who are followed up by 15 rheumatology clinics in our country between 2002 and 2012 were using anti-TNF agents. 73 of them had tuberculosis. More than half of 73 patients had extra-pulmonary tuberculosis and 6 patients died due to tuberculosis. 34% of 73 patients were RA patients and tuberculosis incidence increased in those who used to have anti-TNF agents (18). In our case, regarding the usage of who use anti-TNF agent, tuberculosis pleurisy was ruled out. During the follow-ups of the patient whose therapy was rearranged, spontaneous regression occurred in the fluid.

While RA related pleural effusion is not common, it should be considered in the differential diagnosis of diseases with high morbidity and mortality such as tuberculosis pleurisy and empyema. In this paper, we have reported a case of RA related pleural effusion in a patient receiving biologic therapy.

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