An Unexpected Effusion: Pleural Effusion as the Initial Manifestation of Rheumatoid Arthritis

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Introduction
Rheumatoid arthritis (RA) is a well-known autoimmune, inflammatory arthritis, which commonly has pulmonary manifestations, including pleural disease. Extra-articular disease occurs in approximately 50% of patients, with the lung being a common site of involvement. This is a case of a man presenting with dyspnea and pleural effusion as the initial presentation of rheumatoid arthritis.

Case Description
A 78 year-old man with a history of severe COPD and asbestos-related pleural disease presented with a few months of increasing dyspnea. Vital signs were significant for desaturations to 83% with ambulation. Exam demonstrated absent breath sounds at the left base. Chest radiograph showed bilateral pleural thickening and calcification consistent with asbestos exposure and a moderate left sided pleural effusion (see Figure 1 below).

Serum: protein 7.1 g/dL
Pleural Fluid: 3700 WBCs with lymphocyte predominance (77%), LDH 470 IU/L, protein 5.3 g/dL, and glucose of 28 mg/dL, gram stain negative, cultures with no growth
Light’s criteria: Pleural Protein/Serum Protein = 0.75; Pleural LDH > 2/3 the upper limits of normal

Figure 1. Initial chest x-ray with moderate left sided pleural effusion as well as bilateral pleural plaques.

Thoracentesis yielded 1.8 liters of dark yellow fluid with subsequent pleural fluid studies consistent with exudative effusion by Light’s criteria (pleural, serum) with:

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- Pleural Protein/Serum Protein = 0.75; Pleural LDH > 2/3 the upper limits of normal

Clinical Course
Follow up chest radiograph five days later demonstrated reaccumulation of left sided effusion. Repeat thoracentesis was performed with exudative fluid analysis and markedly elevated LDH (945 IU/L). Due to concern for malignancy, the patient was scheduled for pleural biopsy. However, prior to pleural biopsy, the patient developed new symmetrical hand and wrist pain. Serum rheumatoid factor, ESR, and CRP were all markedly elevated. Hand radiographs showed erosive synovitis. He was treated with prednisone and methotrexate for rheumatoid arthritis and his arthritis subsequently improved. Notably, chest radiograph showed complete resolution of the left pleural effusion after treatment for arthritis (see Figure 2 below).

Discussion
While uncommon, rheumatoid pleural effusion can predate arthritis symptoms. Characteristic findings of a rheumatoid pleural effusion include high LDH, non-monoclonal lymphocytic predominating pleural fluid, very low glucose and low pH. Elevated lipids and adenosine deaminase levels may rarely be seen, but these are not specific to rheumatoid pleural effusions. Measurement of rheumatoid factor in the pleural fluid is not useful, as this can be elevated in other inflammatory states. This case highlights the importance of maintaining a broad differential for exudative effusions, particularly those with high LDH, lymphocytic predominance and low glucose.

References