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Massive Pleural Effusion: A Rare Presentation of Rheumatoid Arthritis

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Abstract

A 45 year old male with recurrent pleural effusion was admitted for acute respiratory failure with massive left pleural effusion. Extensive work up revealed the pleural effusion to be of rheumatoid origin. He underwent thoracentesis and was treated with prednisone and methotrexate. This resolved the pleural effusion without any further recurrence. Massive rheumatoid pleural effusion with acute respiratory failure is a rare presentation of rheumatoid arthritis.

Keywords

pleural effusion; massive; rheumatoid factor; thoracentesis; respiratory failure

Abbreviations

RF: Rheumatoid Factor; Anti-CCP: Anti- cyclic citrullinated peptide antibody; RA: Rheumatoid Arthritis; LDH: Lactate Dehydrogenase; CT: Computed Tomography; NSAIDS: Non-Steroidal Anti-inflammatory Drugs.

Introduction

The most common pulmonary manifestation of Rheumatoid Arthritis (RA) is pleural disease. Pleural effusions are often small and asymptomatic and may occur before, after or concurrent with arthritic disease. Symptomatic effusions in Rheumatoid arthritis are uncommon with a prevalence estimated at about 2%-5% and are usually seen in long standing active disease [1]. Massive pleural effusion with acute respiratory failure is a rare presentation of rheumatoid arthritis, especially in the absence of arthritic disease and seronegative rheumatoid factor. Review of the literature revealed only few case report of significant rheumatoid pleural effusion as a preceding feature of rheumatoid arthritis [2,3,4,5].

Case Report

A 45 year old male presented with shortness of breath and left sided pleuritic chest pain of 2 weeks duration. He denied any cough, fever or night sweats and past medical history revealed left sided thoracentesis 2 weeks previously. He also gave a history of 20-pound weight loss in the last one year. He denied any joint pains or swelling. He had a 20 pack-year smoking history. Vital signs were remarkable for a respiratory rate of 40 and tachycardia with a rate of 120 bpm. Temperature was 98.6°F and there was no jugular venous distension. A chest examination revealed dullness over the left chest with decreased breath sounds. Cardiovascular and abdominal examinations were unremarkable and no articular joint swelling was observed. There were no rheumatoid nodules.

Initial laboratory analysis showed sinus tachycardia on the EKG and serum troponins were negative. His hematocrit was 30% and his white cell count was 7900mm^3. A chest xray was significant for large left sided pleural effusion. He underwent an emergent thoracentesis with chest tube placement. Pleural fluid was bloody and the analysis was notable for a cell count of 4000mm^3 (45% neutrophils, 40% lymphocytes, 15% Eosinophils). Lactate dehydrogenase (LDH) level was 1253 U/l, with a total protein of 5.5 g/dl and glucose of 15mg/dl. Gram stain and Acid fast bacilli stains were both negative. Cytologic examination of the fluid showed acute inflammatory cells with no evidence of malignancy. Bronchoscopy with bronchoalveolar lavage revealed negative findings**.** He was commenced empirically on antibiotics.

While in the hospital his blood cultures, bacterial, mycobacterial and fungal cultures of pleural fluid, as well as HIV screening all came back negative. The Antinuclear antibody titer and Rheumatoid Factor (RF) were also negative. To identify the possible etiology of the recurrent left pleural effusion, the patient underwent left pleural biopsy and pleurodesis. Pleural biopsy revealed mesothelial lined fibroconnective tissue with no evidence of malignancy and the patient was discharged with antibiotics.

Ten days later he was readmitted for the same symptoms of shortness of breath and left sided chest pain. Chest Xray revealed reaccumulation of massive left pleural effusion (Figure1 and Figure 2). He underwent thoracentesis which revealed an LDH of 1040, with glucose of 12mg/dl and protein of 5.3g/dl. Pleural fluid cell count (Neutrophils 40%, Lymphocytes 48% and Eosinophils 12%). Gram stain, AFB stain, Pleural fluid cultures and cytology were again all negative. Considering his low glucose and high LDH in pleural fluid, serum rheumatoid factor was analyzed again. This time Anti-cyclic citrullinated peptide antibody(Anti-CCP) in serum was also tested. The RF came back negative but the Anti-CCP came back high positive (>250). At this point a diagnosis of Rheumatoid Pleural effusion was made and the patient was commenced on prednisone and metotrexate. At his 1 year follow up, there was no evidence of arthritis and he has not had any recurrence of pleural effusion. He is currently maintained on oral prednisone and metotrexate.

Discussion

Pleural effusions in Rheumatoid arthritis are most common in patients with a long history of active articular disease and rheumatoid nodules [6]. Massive pleural effusions as a presenting feature of RA are uncommon and are a diagnostic challenge in the absence of arthritic symptoms. The characteristic findings of the exudative pleural fluid that may favor the diagnosis of Rheumatoid pleural effusion include low glucose (<25mg/dl), low PH (<7.2), high LDH (2-3 times upper limit of normal), high RF titers (>1:320) that exceed levels in the serum (though this was not analyzed in our case) and low C3 and C4 complement levels [7]. Lymphocyte predominance is the norm but neutrophilia may also be seen. This case demonstrates the challenges faced in the diagnosis of rheumatoid pleuritis in a patient with serum negative rheumatoid factor, absence of arthritic symptoms and a primary presentation of massive recurrent pleural effusion with acute respiratory failure. The distinctive feature of this case report is the significant presentation without associated arthritis. Serum positive rheumatoid factor is seen in 95% of patients with RA associated effusions [8]. Rheumatoid factor in pleural fluid was not checked. Another unique feature of this case is the pleural fluid eosinophilia which is a rare finding [8]. The characteristic findings of the pleural fluid (low glucose, high LDH), after exclusion of infection and malignancy, together with the high titers of Anti-CCP antibody helped in clinching the diagnosis. Furthermore, his response to

prednisone and metotrexate with complete resolution of effusion and absence of recurrence further supported the diagnosis.

Small and asymptomatic rheumatoid pleural effusions do not require any treatment. Most cases will resolve spontaneously or with treatment of underlying rheumatoid arthritis [9]. Treatment of large and symptomatic pleural effusion includes NSAIDS, repeated thoracentesis, oral and intra pleural steroids. These modalities of treatment have shown inconsistent benefits and treatment of underlying rheumatoid arthritis may be most helpful [9]. Pleurodesis may be considered in refractory effusions [9]. Decortication may be required in cases of lung entrapment from severe pleural thickening [1,9].

Conclusion

Rheumatoid pleuritis should be considered in the differential diagnosis of unexplained pleural effusion even in the absence of arthritic disease and seronegative rheumatoid factor**.** This will facilitate prompt diagnosis, institution of appropriate therapy and prevent morbidity that may result from delay in diagnosis or misdiagnosis.

Figures

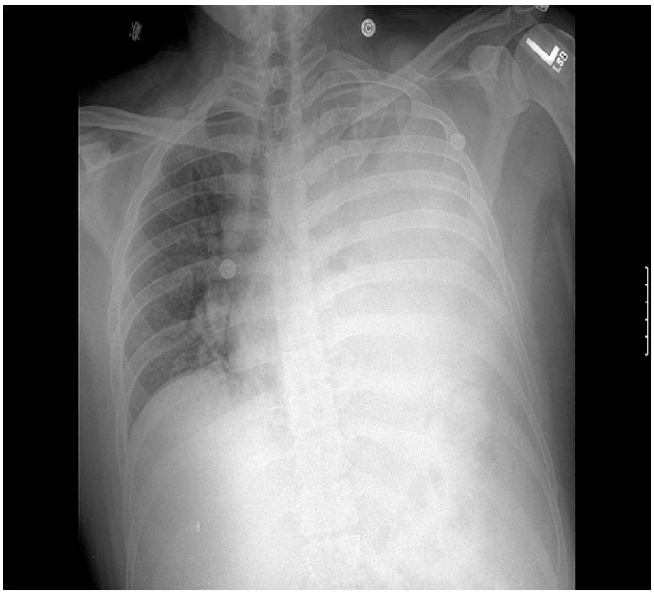

Figure 1: Chest Xray Showing Massive Pleural Effusion

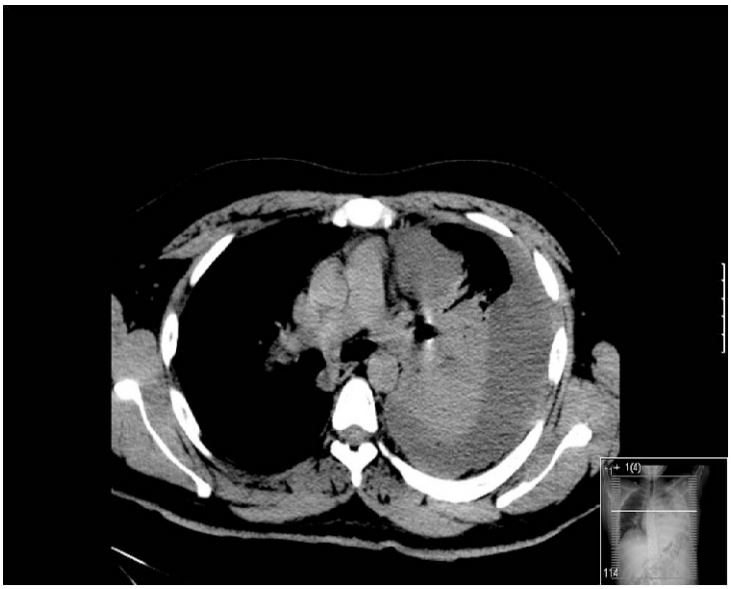

Figure 2: Computed Tomography Showing Left Pleural Effusion and Atelectasis

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