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Bilateral Pleural Efusion as a Manifestation of Ankylosing Spondylitis: A Case Report

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Abstract

Background. Ankylosing spondylitis (AS) is a chronic seronegative spondyloarthropathy, which results in fusion (ankylosis) of the spine and sacroiliac (SI) joints, with the major histocompatibility antigen HLA B27. Although classically thought as a spinal disease, it can involve other organs such as eyes, lungs, and heart. Pleuroparenchymal involvement is uncommon and is seen in the later stages of the disease.

Case Report. A 55-year-old male smoking patient was referred to our hospital for the evaluation of bilateral pleural effusion etiology which was determined on a chest x-ray. His past medical history revealed that he had not a diagnosis of AS. On physical examination there was kyphosis, loss of lumbar lordosis, and fixed bent-forward posturing. His chest X-ray was compatible with a pleural effusion on right sides and Contrast enhanced computed tomography of total body showed bilateral pleural effusion and vertebral lesions related to AS. He was positive for HLA-B27 antigen (95%). Diagnostic thoracentesis revealed that the bilateral pleural effusion was an exudate with a predominance of lymphocytes. He was diagnosed with AS based on the presence of inflammatory back pain, characteristic imaging findings consistent with sacroileitis, and HLA-B27 positivity. Based on these findings pleural effusion was suggested to be due to AS. Complete resolution of the bilateral pleural effusions was documented on chest

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radiography and echocardiography one month after initiation of prednisolone and sulfasalazine therapy.

Conclusion. Pleural effusion is extremely rare extra-articular manifestation of AS, and its diagnosis requires a coordinated multidisciplinary approach involving pulmonologists, imaging specialists, and rheumatologists toward appropriated therapy and subsequent remission.

Keywords: Ankylosing spondylitis, pleural effusion, chest X-ray

INTRODUCTION

Ankylosing spondylitis (AS) (less commonly known as Bechterew disease or Marie-Strümpell disease) is a chronic seronegative spondyloarthropathy, which results in fusion (ankylosis) of the spine and sacroiliac (SI) joints (1), associated to the major histocompatibility antigen HLA B27 (2). AS is a chronic inflammatory multisystemic disease with an unknown etiology (3). *HLA-B27* is the gene with the strongest association (4). Although classically thought as a spinal disease, it can involve other organs such as eyes, lungs, and heart (5). Systemic manifestations of ankylosing spondylitis occur in approximately 25% of patients (6). Pleuroparenchymal involvement is uncommon and is seen in the later stages of the disease or may follow an asymptomatic clinical course (7) and the rate of abnormal findings increases with increased duration of AS (3). We present a case with bilateral pleural effusion without apical fibrobullous disease which responded well to prednisolone and sulfasalazine treatment.

CASE REPORT

A 55-year-old male, active smoker, was referred to our hospital for the evaluation of bilateral pleural effusion etiology which was determined on a chest x-ray. On admission, the patient presented with dyspnea, cough, weight loss, chest pain, sweats and malaise. He also reported chronic low back pain worsening at night and improving with activity associated with morning stiffness more than 30 minutes and progressive limitation of the mobility. His past medical history revealed no prior diagnosis of AS despite a several-year history of symptoms characterized by insidious onset and a progressively worsening course.

The pulse rate was 77/min, respiratory rate of 16/min and a blood pressure of 130/ 80 mmHg. During his stay in hospital, his temperature was 36.70 C. On physical examination, there was pronounced thoracolumbar kyphosis with loss of normal lumbar lordosis, resulting in a fixed stooped posture (Figure 1). Spinal mobility was markedly reduced, particularly on anterior and lateral flexion; chest expansion was limited, consistent with axial involvement typical of AS. Absence of respiratory sounds on the bilateral lung base and dullness on percussion. Rest of his examination was normal.

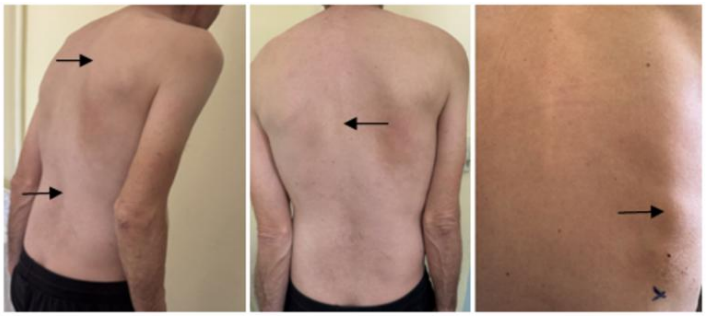

Figure 1. Presentation of the patient's posture with kyphosis, loss of lumbar lordosis, and fixed bent-forward posturing.

His chest X-ray was compatible with a pleural effusion on right sides showing a homogenous opacity obscuring right costophrenic angle (Figure 2 A) and Contrast enhanced computed tomography of total body showed bilateral pleural effusion (DIP right 7.2 cm, dhe left 3.5 cm) (Figure 2 B) and vertebral lesions related to AS, including syndesmophytes, vertebral squaring and sacroiliac joint sclerosis (Figure 2 C).

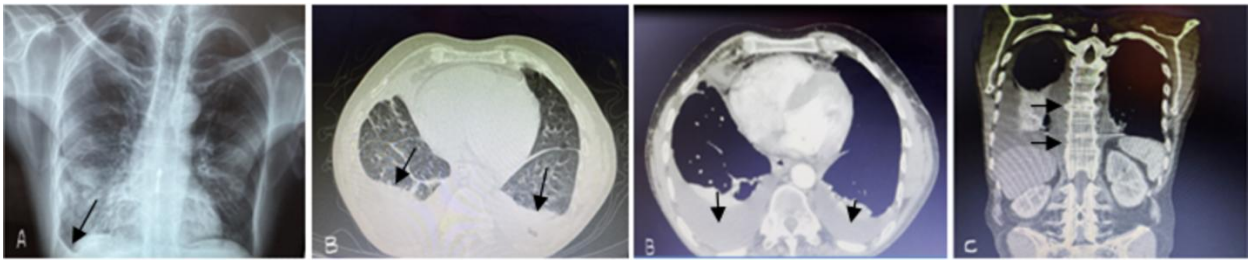

Figure 2. A. The chest radiograph showed small right pleural effusion. B. Computed tomography of total body showing bilateral pleural effusion and ankylosing spondylitis (C).

Laboratory investigations revealed the following data.

Complete blood count was within normal limits: RBW 4.53X10 6/µL hemoglobin 14.6 g/dl, white blood cell-count 5,000/mm3, with 3.8K/µL neutrophils, 0.7 K/µL lymphocytes, 0.4 K/µL monocytes and 0.1 K/µL eosinophils.

Total protein 6.4 g/dl, LDH 237 U/L, Cholesterol 210 mg/dl, Glucose 145 mg/dL. Electrolyte levels, urine analysis renal and liver function tests were all within normal limits.

Antinuclear antibody and rheumatoid factor (RF < 20.0 IU/mL) were negative.

C-reactive protein was normal 0.47 mg/dL (N<0.5 mg/dL), NTpro BNP 141pg/mL, CEA 4.6 ng/mL, CA 19-9: 7.6 U/mL, uric acid 3 mg/dL.

He was positive for HLA-B27 antigen (95%).

HGA: PCO2 46.7 mm Hg, PO2 62.9 mm Hg, Ph 7.426, BE 4.7 mmol/l, SaO2 90.4%.

The interferon-γ release assay QuantiFERON®-TB Gold test was negative and Testi Mantoux was 10 mm.

Diagnostic thoracentesis revealed that the right pleural effusion was an exudate (P/S LDH: 232/237 U/L, P/S protein: 4.2/6.4 g/dl, P/S Glu: 99/145 mg/dL, P/S Cholesterol 115/210 mg/dl, CRP 0.50 mg/dl, with predominance of lymphocytes (84%), monocytes 7%, mesothelial 6%, eosinophils 2%, neutrophils 1%. Histopathologic examination of the right pleural fluid was reported as a fibrinous background with a moderate inflammatory component with rare mononuclear and eosinophils, isolated mesothelial cells or in reactive groups and no malignant cells. Xpert MTB/RIF negative.

Diagnostic thoracentesis revealed that the left pleural effusion was an exudate (P/S LDH: 147/237 U/L, P/S protein: 4.3/6.4 g/dl, P/S Glu: 131/145 mg/dL, P/S Cholesterol 96/210 mg/dl, CRP 0.14 mg/dl.

with predominance of lymphocytes (90%), monocytes 3%, mesothelial 4%, eosinophils 3%.

Xpert MTB/RIF negative. A pleural biopsy was not performed.

AS was diagnosed by the rheumatologist based on the Modified New York criteria supported by imaging findings, clinical features and HLA B-27 positivity. On the basis of these findings, the bilateral pleural effusions were attributed to AS, as a rare extra-articular manifestation.

A course of prednisolone 50 mg daily was begun with a diagnosis as spondylitic pleural effusion after excluding possible etiology. He was discharged from the hospital 17 days later with a recommendation to gradually reduce the dose of prednisolone by 5 mg every 10 days to 5 mg daily. A continuous maintenance regimen of sulfasalazine 500 mg administered twice daily was also initiated.

He responded quickly to treatment and all his symptoms completely resolved within two weeks. Bilateral pleural effusion completely resolved on chest X-ray and echocardiography one month later (Figure 3). Lung fuction test: FEV1- 48.5%, FVC-37.5%, FEV1/FVC - 99.92%, Restrictive ventilatory dysfunction.

The patient then continued to be followed by the rheumatologist.

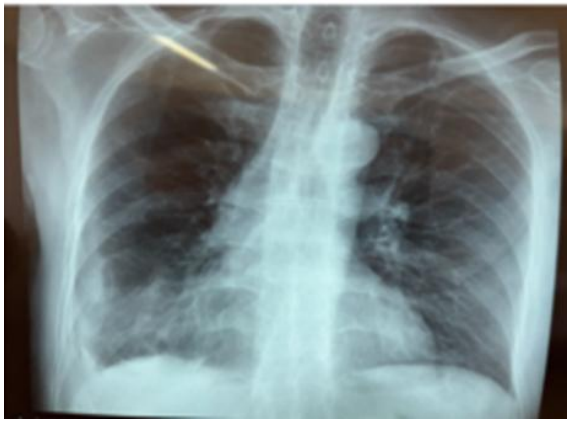

Figure 3. Chest x-ray PA view shows bilateral pleural effusions resolved after one-month treatment with steroid and sulfasalazine.

DISCUSSION

AS is a chronic seronegative spondyloarthropathy, which results in fusion (ankylosis) of the spine and sacroiliac (SI) joints (1). Traditionally it was thought there was a male predilection of 3:1 or more. AS is a chronic inflammatory multisystem disease with an unknown etiology (3). Patients are rheumatoid factor (RF) negative, hence seronegative. *HLA-B27* is the gene with the strongest association (4). Diagnosis requires showing sacroiliitis on imaging or spine inflammation using MRI (8). In our case, the patient underwent contrast enhanced computed tomography to evaluate pleural effusions. Review of the bone window by the radiologist revealed vertebral changes suggestive of AS. This incidental finding, together with characteristic clinical features, prompted further targeted investigations.

Although MRI is the gold standard for detecting early inflammatory changes, the lesions were clearly visible on HRCT, indicating established disease, which aligns with the patient's longstanding history of low back pain and prolonged morning stiffness.

Furthermore, pulmonary involvement in AS is described in the literature as a less frequent extra articular manifestation. The most frequently seen symptoms are: upper lobe fibrobullous disease, interstitial lung disease, pleural thickening, pleural effusion and the formation of mycetoma (7).

Pleural effusion is extremely rare (9). Pleural effusion occurs in autoimmune connective tissue diseases as a part of the inflammatory component. It could also be due to serositis related to ankylosing spondylitis (10). Isolated pleural effusion may be seen in patients with AS without a simultaneous apical fibrobullous involvement of the lungs and it responds well to corticosteroids (5). Kinnear and Shneerson had reported only pleural effusion without apical involvement (11). These effusions were bilateral (9) or unilateral (11).

These changes seen in AS were observed using X-rays, respiratory function tests in previous studies (7). Computed tomography is useful in delineating the extent of pleural thickening, bullous changes, volume loss, parenchymal fibrosis, and bronchiectasis, as well as identifying or excluding an intracavitary pulmonary mycetoma (12). In our case, Contrast enhanced computed tomography of total body showed bilateral pleural effusion and vertebral lesions related to AS.

There is no correlation between the radiological extent of the disease (spinal changes and pulmonary involvement) and any of the haematological or biochemical parameters measured (13). In the present case Complete blood count and biochemical parameters measured was within normal limits.

Pleural effusion developed in AS patients is usually exudative with a normal pH and glucose values (14). It can be diagnosed via exclusion of other etiologies such as parapneumonic effusion, tuberculosis and malignancies. Pleural biopsies can be performed and mainly result in chronic inflammation (15).

In the present case, the bilateral pleural effusion was also an exudate with normal glucose level. The predominant inflammatory cells were lymphocytes. Histopathologic examination of pleural effusion was compatible with chronic inflammation and no malignant cells. Xpert MTB/RIF negative.

A restrictive ventilatory impairment can develop in patients with ankylosing spondylitis because of either fusion of the costovertebral joints and ankylosis of the thoracic spine or anterior chest wall involvement (16). Our case resulted restrictive ventilatory dysfunction.

The treatment of AS associated pleural effusion is not well documented (15). Pleural effusion resolves spontaneously in some cases. However, systemic or local steroids or phenylbutazone had been effective in the pleural effusion (17).

CONCLUSION

In summary, we present a case of AS who had pleural effusion and responded well to treatment with prednisolone and sulfasalasine. The clinician should be aware of this presentation of AS without apicobullous disease. The diagnosis of pleural effusion from AS was determined by multidisciplinary team work including pneumologist, imaging specialist and rheumatologist. Careful consideration of differential diagnoses is essential in patients presenting with pleural effusion and articular symptoms to avoid overlooking alternative or coexisting conditions.

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Conflict of Interest Statement: The authors declare that they have no conflict of interest.

REFERENCES

1. Gaillard F, Kearns C, Knipe H, et al. Ankylosing spondylitis. Radiopaedia.org 2025. https://doi.org/10.53347/rID-904.

2. Levent Erkan , Oguz Uzun, Serhat Findik et al. Isolated pleural and pericardial effusion in a patient with ankylosing spondylitis. Respir Med 2007;101(2):356-8.

3. Zehra Isik Hasiloglu, Nuri Havan, Aylin Rezvani et al. Lung parenchymal changes in patients with ankylosing spondylitis. World J Radiol 2012; 4(5): 215-219.

4. Evans D, Spencer C, Pointon J et al. Interaction Between ERAP1 and HLA-B27 in Ankylosing Spondylitis Implicates Peptide Handling in the Mechanism for HLA-B27 in Disease Susceptibility. Nat Genet 2011;43(8):761-7.

5. Edalatifard M, Rahimi B, Kazemizadeh H et al. Isolated Pleural Effusion in a Patient With Ankylosing Spondylitis and His Dramatic Response to Prednisolone. Case Reports in Clinical Practice 2018; 3(4):123-127.

6. Stolwijk C, van Tubergen A, Castillo-Ortiz JD, Boonen A: Prevalence of extra-articular manifestations in patients with ankylosing spondylitis: a systematic review and meta-analysis. Ann Rheum Dis 2015;74(1):65-73.

7. Kiris A, Ozgocmen S, Kocakoc E, Ardicoglu O, Ogur E. Lung findings on high resolution CT in early ankylosing spondylitis. Eur J Radiol 2003; 47: 71-76.

8. Wenker KJ, Quint JM. Ankylosing Spondylitis. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing 2025. PMID: 29261996.https://www.ncbi.nlm.nih.gov/books/NBK519051/.

9. Rosenow EC, Strimlan CV, Muhm JR. Pleuropulmonary manifestations of ankylosing spondylitis. Mayo Clin Proc 1977;52:641-49.

10. Bouros D, Pneumatikos I, Tzouvelekis A. Pleural involvement in systemic autoimmune disorders 2008; 75(4):361-7.

11. W.J.M. Kinnear, J.M. Shneerson Acute pleural effusion in inactive ankylosingspondylitis Thorax 1985;40:150-1.

12. Rumancik WM, Firooznia H, Davis MS Jr. Fibrobullous disease of the upper lobes: an extraskeletal manifestation of ankylosing spondylitis. J Comput Tomogr 1984; 8:225-229.

13. Chakera TM, Howarth FH, Kendall MJ, Lawrence DS, Whitfield AG. The chest radiograph in ankylosing spondylitis. Clin Radiol 1975; 26: 455-459.

14. Tanoue LT. Pulmonary involvement in collagen vascular disease: a review of the pulmonary manifestations of the Marfan syndrome, ankylosing spondylitis, Sjögren's syndrome, and relapsing polychondritis. J Thorac Imaging 1992; 7: 62–77.

15. Umran Ozden Sertçelik , Elif Tugce Korkmaz, Elif Babaoğlu, Sevinc Sarınc Ulaşlı, Deniz Köksal, Salih Emri, A Rare Cause of Pleural Effusion: Ankylosing Spondylitis. Acta Medica 2018; 49(2): 38-40.

16. Naveen Kanathur , Teofilo Lee-Chiong. Pulmonary manifestations of ankylosing spondylitis. Clin Chest Med 2010;31(3):547-54.

17. Tanaka H, Itoh E, Shibusa T, Chiba H, Hirasawa M, Pleural effusion in ankylosing spondylitis: successful treatment with intra-pleural steroid administration. Respiratory Medicine 1995; 89: 509-11.