

CASE REPORT

AN INTERESTING CASE OF PNEUMOTHORAX IN RHEUMATOID ARTHRITIS

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HOW TO CITE THIS ARTICLE:

Shruthi S, R. Manjunath, Rajeev H. Gowda, Aravind M. N. "An Interesting Case of Pneumothorax in Rheumatoid Arthritis". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 58, November 3; Page: 13209-13214, DOI: 10.14260/jemds/2014/3758

ABSTRACT: Rheumatoid Arthritis is a multisystem disease with pulmonary manifestations including idiopathic pulmonary fibrosis, obliterative bronchiolitis, pneumonitis, bronchiectasis as well as pneumothorax. Cases of rheumatoid arthritis with active tuberculosis disease have been documented as well as reactivation of latent tuberculosis as a result of methotrexate therapy with or without systemic steroids has led to a renewed interest in the association of the two diseases. We report the case of rheumatoid arthritis in a young female patient who presented with cough and fever of fortnight duration and rapidly developed spontaneous pneumothorax that eventually required surgical pneumonectomy. **CONCLUSION:** Even though patients with rheumatoid arthritis can present with spontaneous pneumothorax due to rupture of rheumatic nodules, Common diseases like tuberculosis should be kept in mind while treating pulmonary complaints in patients with rheumatoid arthritis, especially those who are on methotrexate therapy.

KEYWORDS: RHEUMATOID ARTHRITIS, PNEUMOTHORAX, METHOTREXATE, TUBERCULOSIS.

CASE REPORT: A 25 year old female, a known case of Rheumatoid arthritis since 7 years, was on treatment with methotrexate and HCQS since 4 months (due to symptom exacerbation), presented to the outpatient clinic with complaints of fever with chills and cough since 15 days. Fever was intermittent, high grade, associated with chills. Cough was productive, with scanty serous sputum. She did not give any history suggestive of dyspnea, hemoptysis or chest pain. She did not complain of any weight loss or anorexia. No past or contact history of tuberculosis or any other known co morbidities.

On examination, she was febrile (102 F) with normal general as well as systemic examination. A provisional diagnosis of viral fever was made and the patient was admitted to the inpatient department. Her initial blood investigations were: Hb-11 g%, TC-13520, ESR- 64, Peripheral smear: Normocytic hypochromic anemia with leukocytosis and neutrophilia. Platelet count of 3 lakhs/mm.³

liver function tests revealed hypoalbuminaemia (2.6g %) with normal enzyme levels. Renal function test were normal. No Malarial parasites were found and antibody test for typhoid revealed negative results.

Chest x ray was reported to be normal.

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Fig 1: Chest X Ray at Presentation

Symptomatic treatment was started but she failed to respond to it. On 4th day of treatment, she complained of breathlessness, which was acute in onset, MRC grade 5. On examination, she had Tachypnea (32/min), tachycardia (110/min), BP- normal. Trachea was central, while hyper-resonant note and Decreased air entry in right infrascapular, infra-axillary and mammary area was elicited.

No added sounds were noted. Other system examinations were remarkably normal. Her blood investigations revealed Hb-11.3g%, elevated total counts ($15,570/\text{mm}^3$) with polymorphonuclear leukocytosis (87%). Her ESR was raised (84 mm at the end of one hour) and her serum albumin was decreased (2.6 g/dl). Liver enzymes, renal function tests and serum electrolytes were essentially normal. Platelet count was also found to be normal and no organism was cultured in blood culture test.

Repeat Chest x ray showed right sided pneumothorax.



Fig. 2: plain chest radiogram showing right sided pneumothorax

Intercostal drainage tube was inserted. Later she developed subcutaneous emphysema with persistent Pneumothorax. On auscultation, bronchial breathing was heard in right axilla. Bilateral coarse crepitations were heard. Antibiotics started. However patient continued to have fever and breathlessness and developed pyo-pneumothorax.

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Fig. 3: Pneumothorax with subcutaneous emphysema with ICD in situ

As the patient condition worsened, CECT thorax was done which showed right upper lobe broncho-pleural fistula, right sided hydro-pneumothorax, collapsed lung and diffuse bilateral subcutaneous emphysema.

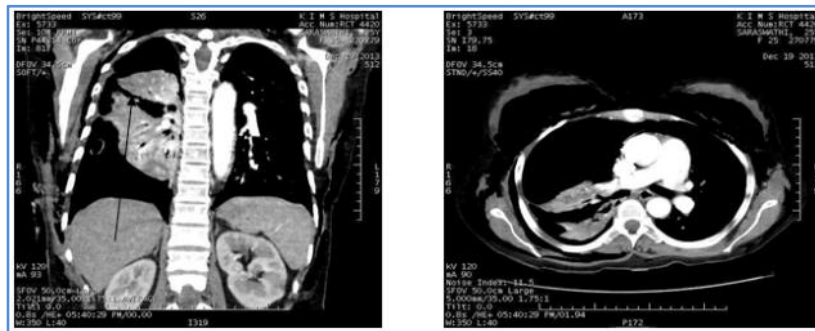


Fig. 4A, 4B: Ct Images Showing Upper Lobe Bronchopleural Fistula, Right Sided Hydro-Pneumothorax, And Diffuse Bilateral Subcutaneous Emphysema

Diagnosis made was Right upper lobe bronchopleural fistula secondary to? Rheumatoid arthritis. Pleural fluid analysis was done; it showed Exudate with neutrophilic predominance AFB stain yielded negative results. Pleural fluid culture showed acinetobacter. Antibiotics were continued based on culture sensitivity. Day25, Bronchoscopy was done which showed right upper lobe? fungal growth/? pyogenic granulation tissue with BPF.

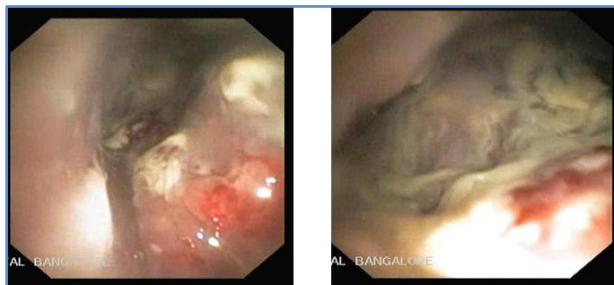


FIG 5A, B: Bronchoscopy images showing mass in right upper lobe (? fungal growth/granulation tissue)

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BAL – was negative for AFB as well as KOH mount. Antibiotics were continued. Empirically patient was started on antifungal and on ATT. As the patient condition remained the same and due to necrosis of right upper lobe with bronchopleural fistula, patient was posted for right upper lobectomy. On table - necrosis and adhesion of entire lung was found. Hence right pneumonectomy was done.

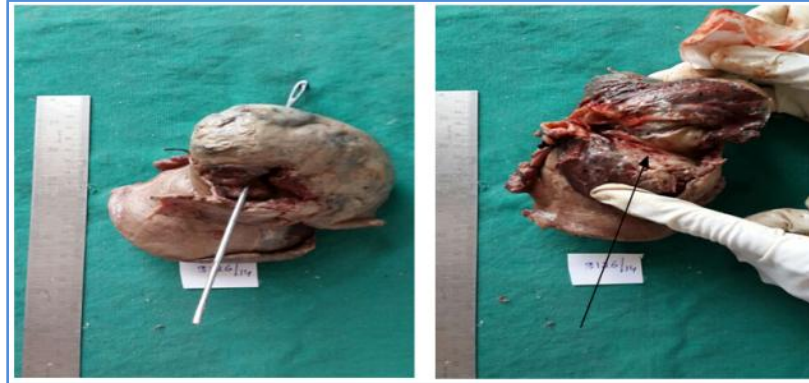


FIG 6A, 6B: necrosis of right upper lobe with bronchopleural fistula, cut section showing white cheesy nodular areas

On cut section - large bronchopleural fistula 8cm in length & covered with cheesy material. Rest of right lung shows grey white cheesy nodular areas. Histopathological study of the sections revealed epithelioid granuloma with multinucleate giant cells with large areas of caseating necrosis suggestive of tuberculosis.

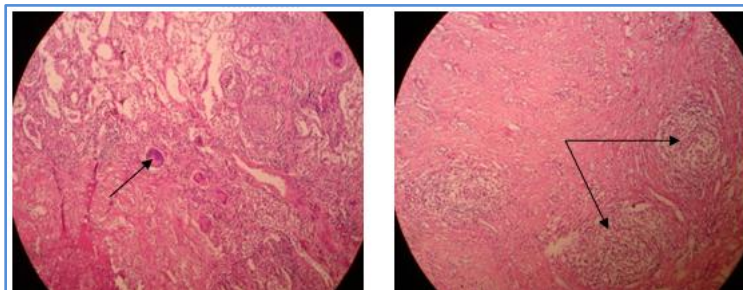


FIG 7A, 7B: Epithelioid granuloma with multinucleate giant cells with large areas of caseating necrosis suggestive of tuberculosis

ATT was continued; patient general condition improved and was discharged after 45 days. Final Diagnosis made as “Right upper lobe bronchopleural fistula secondary to necrotizing tuberculosis of right lung with rheumatoid arthritis”

DISCUSSION: Rheumatoid Arthritis is a multisystem disease with pulmonary manifestations including idiopathic pulmonary fibrosis, obliterative bronchiolitis, pneumonitis; bronchiectasis.1 Radiographically rheumatoid nodules are infrequently seen - less than 1 percent. More common in men- particularly those who smoke, with active articular disease, high rheumatoid factor titre, and in those who have subcutaneous nodules.^{2,3} They may vary in size. The nodules can cause hemoptysis, pneumothorax or bronchopleural fistula depending on their location.

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Pneumothorax in RA may be associated with eosinophilia, high ESR and other pulmonary manifestations of RA, such as pulmonary fibrosis and vasculitis⁴. Our patient however did not have eosinophilia. The literature contains descriptions of similar cases requiring differential diagnosis to rule out other entities, such as bronchogenic carcinoma or tuberculosis.⁵ Therefore a histologic diagnosis is needed to assure that images correspond to rheumatoid nodules.⁶

Wolfe, et al calculated the annual incidence of TB in 10,782 American RA patients to be 6.2 per 100,000 per year, similar to the 6.8 per 100,000 rate reported for the general US population.⁷

Indeed, cases of active TB in patients with rheumatoid arthritis (RA) have recently been reported, and this has brought about a renewed interest in the relationship between the 2 diseases.⁸ In our patient, such a rapid progression of Respiratory symptoms leading upto necrosis of almost whole lung could be attributed to? Immunosuppression by methotrexate (but total count was normal on presentation) or? hypoalbuminemia.

Rheumatoid arthritis is associated with hypoalbuminemia. Chronic inflammation due to RA is associated with a greater fractional catabolic rate (FCR) and, when extreme, increased transfer of albumin out of the vascular compartment. A vicious cascade of events ensues in which inflammation induces anorexia and reduces the effective use of dietary protein and energy intake and augments catabolism of the key somatic protein, albumin.⁹

Methotrexate inhibits the production of intracellular polyamines, which are essential for lymphocyte growth and replication. Friedman et al. and many others have confirmed that MTX depresses established delayed hypersensitivity.¹⁰ Additionally, a recent study suggested that Methotrexate promotes the apoptosis of activated T cells, which in turn limits T-cell proliferation.¹¹ The activation of tuberculosis in psoriatic patients receiving methotrexate therapy has been well known for years.¹²

More recently, late reactivation of pulmonary and extra pulmonary tuberculosis in patients with rheumatoid arthritis on methotrexate therapy has been highlighted.¹³ The increasing use of low-dose MTX in RA, alone or in combination with corticosteroids, clearly predisposes to increased susceptibility to infection, including TB.¹⁴

CONCLUSION: Spontaneous pneumothorax due to rupture of a rheumatoid nodule, is a known, albeit uncommon, complication, Common diseases like Tuberculosis should not be forgotten in our country and attempt should be made to prove it. Although it is not possible to prevent all cases of tuberculosis reactivation, some steps can be used to reduce the risk. A history of possible tuberculosis exposure or previous infection should be elicited from all patients before prescribing methotrexate. We suggest that physicians caring for (iatrogenically) immunosuppressed patients should be aware of the potential hazards of Tuberculosis, since early chemotherapy and chemoprophylaxis would reduce TB-associated morbidity and mortality in patients with rheumatic diseases.

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Date of Submission: 29/09/2014.
Date of Peer Review: 30/09/2014.
Date of Acceptance: 29/10/2014.
Date of Publishing: 03/11/2014.