with positive rheumatoid factor, mild arthritis of his hand joints, and lung involvement for several years with multiple rheumatoid nodules. An open lung biopsy done 3 yr previously showed interstitial lymphoid hyperplasia with giant multinuclear cells that was consistent with pulmonary involvement of RA. He was maintained on prednisone 10 mg per day for several years. Pulmonary status remained stable up to his present admission. Methotrexate (MTX) 7.5 mg per week was added to this regimen a year prior to admission due to active arthritis. He had a history of heavy smoking until recently.

On admission, the patient was not dyspnoic, and had a temperature of 37.4°C. No lymphadenopathy was detected. Heart sounds were normal. His lungs were clear on auscultation. The abdomen was mildly distended but not tender. The liver and spleen were not enlarged. There was no skin rash. There was no evidence of active arthritis or subcutaneous rheumatoid nodules. Laboratory studies showed a white blood count of 8000/mm³, haemoglobin of 14 g/dl and a platelet count of 137 000/mm³. Eosinophil count was 200/mm³. Erythrocyte sedimentation rate (ESR) was 24 mm at 1 h. Chest X-ray demonstrated a cavitary lesion in the left lower lobe, 5 cm in diameter, and a similar lesion in the right upper lobe of 2 cm diameter (Fig. 1A). A scan of the chest showed numerous cavitary lesions in both lungs, with clear evidence of progression in both size and number of the nodules compared with a study done 3 yr before. A cavitary lesion of 5×3×2 cm in the left lower lobe had grown significantly compared with the previous CT.

A diagnosis of active rheumatoid lung disease was made, MTX was discontinued and steroid therapy was increased (60 mg per day). However, 1 day after steroid treatment was started the patient developed sudden shortness of breath with severe pleuritic chest pain. Chest X-ray revealed a large pneumothorax of the left lung (Fig. 1B). Drainage by a chest tube produced 350 cc transudative fluid. Fluid cultures were negative for bacteria. No malignant cells were evident. The patient’s recovery was uneventful and he was discharged on prednisone treatment that was gradually reduced to 10 mg per day over a period of 2 months. Follow-up after 6 months showed the patient to be in a stable condition without symptoms.

Pulmonary necrobiotic nodules are a relatively rare manifestation of RA, occurring in less than 0.5% of patients with RA [1]. Usually, they are associated with the presence of subcutaneous rheumatoid nodules, and appear mainly in men with long-standing seropositive RA. These nodules may be single or multiple, varying in size from 0.5 cm to a few centimetres, and may regress or enlarge spontaneously [2]. The nodules can cavitate, causing haemoptysis, if they are close to a main bronchus, or may cause pneumothorax if they are situated peripherally adjacent to the pleura.

Previous reports in the literature have suggested that the occurrence of spontaneous pneumothorax secondary to rheumatoid nodules is associated with inflammatory

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Secondary spontaneous pneumothorax in a patient with pulmonary rheumatoid nodules during treatment with methotrexate

Sir, Methotrexate (MTX) is a first-line disease-modifying drug in rheumatoid arthritis (RA) and improves articular manifestations of this disease. Its effect on extra-articular complications of this disease is less clear. We describe a patient with long-standing RA who presented with enlarging pulmonary necrobiotic nodules and subsequently developed a spontaneous pneumothorax during treatment with MTX.

A 64-yr-old male was admitted due to a low-grade fever and non-productive cough with pleuritic chest pain of several weeks. He had suffered from RA for 10 yr
To our knowledge, this is the first described case of a patient with spontaneous pneumothorax secondary to cavitary nodules during treatment with MTX. The patient had active pleuropulmonary disease, which caused fever, cough and mild pleuritic pain. MTX may have aggravated the pulmonary disease, causing enlargement of the pulmonary cavitation, leading to pneumothorax. Therefore, augmentation of anti-inflammatory therapy should be considered (such as increasing the dose of steroids), even in patients treated with low-dose MTX.

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Fig. 1. (A) Posteroanterior upright chest radiograph revealing a cavitory lesion in the left lower lobe, 5 cm in diameter, and a similar lesion in the right upper lobe of 2 cm diameter. (B) Posteroanterior upright chest radiograph revealing a large pneumothorax of the left lung.

MTX has not been shown clearly to affect extra-articular manifestations of RA, and these manifestations could nevertheless worsen during treatment with the drug [5]. Additionally, MTX carries a significant risk of pulmonary toxicity [5,6]. Toxicity includes acute pneumonitis, pulmonary fibrosis and opportunistic infections such as *Pneumocystis carinii* and a high rate of herpes zoster [8]. Patients with pulmonary involvement in RA are more likely to develop MTX-induced pulmonary toxicity [6]. A previous report suggested that MTX might be involved in exacerbating extra-articular manifestations of RA, such as subcutaneous nodulosis and cutaneous vasculitis, that gradually disappeared after discontinuation of MTX [9]. However, the report did not comment on rheumatoid pulmonary nodules during MTX therapy.