CASE REPORT

Combined pulmonary fibrosis and emphysema in hypersensitivity pneumonitis

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SUMMARY

Combined pulmonary fibrosis and emphysema is a distinct syndrome reported in patients who smoke. A 72-year-old, never-smoking female dairy farmer was referred for progressive dyspnoea on exertion, basal crackles on auscultation, normal spirometry and normal lung volumes but decreased diffusing capacity of the lung for carbon monoxide, centrilobular emphysema in the upper zones of the lungs and diffuse infiltrative lung disease in the lower zones on high-resolution CT scan. Bronchoalveolar lavage differential cell count showed 35% lymphocytosis, and precipitating antibodies for *Wallemia sebi*, *Trichoderma* species and *Cladosporium sphaerospermum* were identified. The diagnosis of farmer's lung disease with combined pulmonary fibrosis and emphysema was retained. This case highlights for the first time that hypersensitivity pneumonitis should be suspected in the setting of combined pulmonary fibrosis and emphysema in non-smoking patients.

BACKGROUND

Combined pulmonary fibrosis and emphysema is increasingly reported in the literature. It is a distinct syndrome observed in patients affected by smoking-induced chronic lung disease, and is characterised by dyspnoea and inspiratory crackles on examination. On high-resolution CT (HRCT), emphysema is generally found in the upper lobes, and fibrosis in the lower lobes, while functional examination shows normal lung volume and spirometry.[1] Causal contexts other than tobacco smoking have been reported, especially in occupational exposure and connective tissue diseases.[2 3] We report here a case of combined pulmonary fibrosis and emphysema in a non-smoking dairy farmer with hypersensitivity pneumonitis.

CASE PRESENTATION

A 72-year-old woman who never smoked and who was still working as a dairy farmer, reported of chronic cough and dyspnoea (mMRC grade 2 for about 10 years and grade 3 for the past 6 months). She was exposed to dust from mouldy fodder daily. She experienced increased symptoms when working, especially in the winter, although she lived in her place of work and was therefore constantly exposed. She had no other relevant personal or family history, in particular, none of her relatives had any history of interstitial lung disease (ILD). She was not exposed to secondhand or thirdhand smoke and was not taking any medication likely to cause ILD. Inspiratory crackles were found on chest examination. She did not have finger clubbing. Spirometry and lung volumes were normal: forced vital capacity (FVC) was 99% of predicted value (pred); total lung capacity, 87% pred; forced expiratory volume in 1 s (FEV_1), 96% pred; FEV_1/FVC ratio, 79%. However, further pulmonary function tests disclosed impairment of single-breath diffusion capacity of the lung for carbon monoxide (DLCO) at 44% of the predicted value. Blood gases indicated resting hypoxaemia (60 mm Hg) without hypercapnia. The 6 min walk test showed exertional desaturation (92–81% breathing room air) and shortened walking distance (435 m, 80% pred). HRCT revealed diffuse bullous emphysema in the upper lung fields associated with honeycombing fibrosis in the lower lobes (figure 1). Bronchoalveolar lavage (BAL) showed lymphocytic alveolitis (450 cells per mm^3); differential cell count was: 51% macrophages, 35% lymphocytes, 10% neutrophils and 4% eosinophils. Echocardiography was normal, with systolic pulmonary arterial pressure estimated at 35 mm Hg. Antinuclear antibodies were negative and α-1 antitrypsin level was normal. Precipitating antibodies were positive for *Wallemia sebi (3 arcs)*, *Trichoderma* species (3 arcs) and *Cladosporium sphaerospermum* (2 arcs).

Finally, a diagnosis of chronic farmer's lung disease with functional and radiological features of combined pulmonary fibrosis and emphysema was retained.

DIFFERENTIAL DIAGNOSIS

In our case, the diagnosis of hypersensitivity pneumonitis (farmer's lung disease) is robust based on the combination of the clinical presentation (progressive dyspnoea, chronic cough and inspiratory crackles), the context (daily exposure to dust from mouldy fodder), the immunological features (positive precipitating antibodies to known offending antigens) and the BAL findings (lymphocytic alveolitis).[4]

In view of the patient's age and respiratory status, we did not perform lung biopsy, in accordance with the patient's own preferences. Nevertheless, this patient met all the diagnostic criteria for hypersensitivity pneumonitis (HP). In addition, according to the HP study,[5] our patient had a probability of 97% of having a HP.

The diagnosis of combined pulmonary fibrosis and emphysema is also robust because of the combination of functional (normal spirometry and lung

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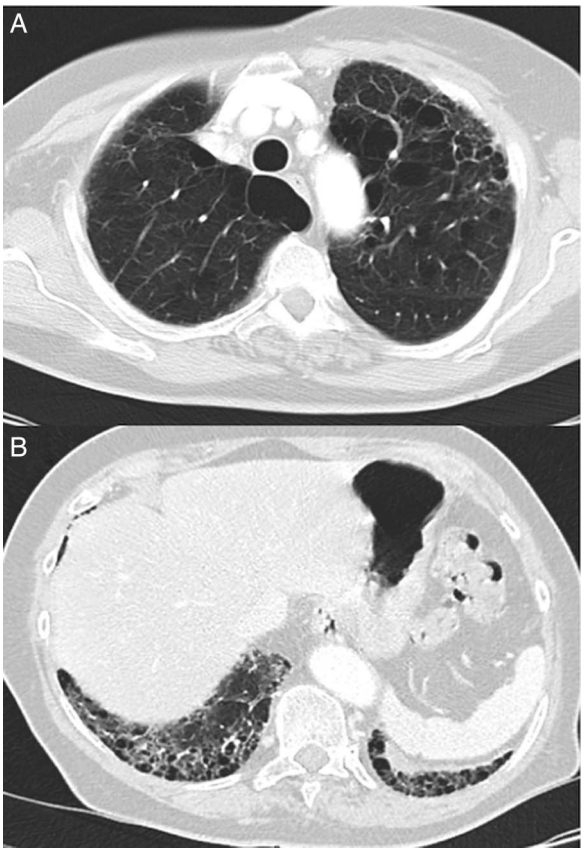

Figure 1 Axial high-resolution CT showing association between emphysema in the upper lobes (A) and fibrosis in the lower lobes (B).

volume, impaired DLCO, hypoxaemia) and radiological features (pulmonary emphysema in the upper lobes and fibrosis in the lower lobes).

TREATMENT

The patient was asked to avoid exposure at the farm. Nevertheless, this therapeutic option was not possible because she refused to move from her home. Furthermore, treatment with a full face mask was not used, in accordance with the patient's own preference.

We therefore prescribed oral corticosteroids (40 mg/day) for about 4 months. This yielded a moderate but significant improvement in the patient's symptoms and functional tests, notably, the 6 min walk test (exertional saturation decreased from 96% to 94%, with a similar walking distance (440 m) to that observed before treatment).

OUTCOME AND FOLLOW-UP

After 4 months of treatment, corticosteroid therapy was decreased by 5 mg every 4 weeks. Stabilisation of the patient's symptoms was obtained with a dose of 10 mg/day. The patient was followed up for at least 1 year during which it was necessary to maintain this dose to avoid a relapse.[6]

DISCUSSION

Although combined pulmonary fibrosis and emphysema is mainly due to tobacco smoking, it has also been reported in non-smoking patients.[7 8]

Emphysema has previously been reported in non-smoking patients with HP.[9] The combination of emphysema and fibrosis has been further suggested in the setting of farmer's lung disease,[9 10] but only in current or former smokers. Even though fibrosis and emphysema are hallmarks of hypersensitivity pneumonitis, we did not find any case report of combined pulmonary fibrosis and emphysema in hypersensitivity pneumonitis in the medical literature through MEDLINE using a search combining the terms 'hypersensitivity pneumonitis' OR 'extrinsic allergic alveolitis' AND 'combined pulmonary fibrosis and emphysema'.

In conclusion, we report for the first time a well-documented case of combined pulmonary fibrosis and emphysema induced by HP.

Learning points

- Emphysema and fibrosis have previously been reported in hypersensitivity pneumonitis.
- Combined pulmonary emphysema and fibrosis is a distinct syndrome observed in smokers, with specific clinical, functional and radiological features.
- We report a typical case of combined pulmonary fibrosis and emphysema induced by hypersensitivity pneumonitis in a patient who never smoked.
- Chronic occupational exposure seems to play a role similar to tobacco in the genesis of combined pulmonary fibrosis and emphysema.

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