Case Reports

Hamman-rich syndrome ‘primed’ by radiation?

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Introduction

In 1933 (1) and 1944 (2) Hamman and Rich described cases of fulminating interstitial pneumonia. Such cases are rare. There is no proven treatment although steroids and immunosuppressants are used. The prognosis is poor. Radiation-induced pulmonary fibrosis and bronchiolitis obliterans organizing pneumonia (BOOP) have been described occurring about 1 year after chest irradiation, but to our knowledge no case of Hamman–Rich syndrome has been described.

Case Report

A 53-year-old woman presented with a painful right arm. She had been generally unwell for 2 weeks with breathlessness on exertion. Three years previously she had had a left-sided mastectomy for breast carcinoma and radiotherapy to the left chest wall.

Examination revealed a tender right arm, lymphoedema of the left arm and fine inspiratory crackles at the left base. There was no pyrexia, cyanosis, clubbing, lymphadenopathy or dyspnoea at rest. Chest radiography revealed shadowing at the left base (Fig. 1). Venography of the right arm and a bone scan were normal. Five days later the patient developed increasing dyspnoea and a fever of 38.5°C. Bilateral mid-zone crackles were present. Bronchopneumonia was suspected and erythromycin begun. Blood gas analysis revealed a PO$_2$ of 7.6 kPa and PCO$_2$ of 3.6 kPa with a normal pH. Oxygen was administered. Two days brought no improvement. Radiographic changes were now bilateral. Lymphangitis carcinomatosa and interstitial pneumonia were considered. An autoimmune screen was negative. CT scanning was not possible due to dyspnoea. Bronchoscopy with transbronchial biopsy was performed but histology was normal. By day 16 the patient was apyrexial but deteriorating. High dose steroids were started. The decline continued with the PO$_2$ falling to 4.4 kPa despite 60% oxygen. The patient died 21 days after admission. Post-mortem examination revealed widespread changes of a Hamman–Rich type fibrosis with lesser changes of super-added infection. There was no evidence of malignant disease.

Discussion

The label 'Hamman–Rich syndrome' has been applied to different histological and clinical entities but we use it to

Fig. 1. Detail of chest radiograph at admission showing left basal changes. Note previous mastectomy.
refer to a clinical picture of fulminant (sub)acute interstitial pneumonia with a histological picture dominated by interstitial elements and few acute inflammatory cells. This is similar to the 'diffuse interstitial pneumonia' described by Katzenstein (3). An autoimmune cause is possible. One study showed immunofluorescence in alveolar sections disappearing as end-stage fibrosis developed (4), but in general no convincing link has been demonstrated. We speculate that the radiotherapy given 3 years previously may have primed the lung to develop fibrosis. However, breast carcinoma is common and both diseases may have arisen by chance.

Radiation causes acute inflammation and late fibrosis in about 10% of those exposed. The delay between exposure and disease is considerable, at around 2 and 9 months respectively. Bilateral pneumonitis was reported after unilateral irradiation in 1964 (5). Recent reports describe unilateral irradiation causing bilateral lymphocytic alveolitis on bronchoalveolar lavage (6,7). Additionally, cases of BOOP have been reported occurring 2–7 months after radiotherapy (8–10). BOOP has been described, confined entirely to the radiation field, occurring 13 yr after exposure, although causation has been disputed (11).

Radiation can cause interstitial lung disease with a considerable latent period. In the case described here the delay was 3 years. Latent periods can be explained by the concept of 'priming': ionizing radiation passing through lung tissue could damage epithelial and endothelial cells, denuding basement membranes and revealing previously hidden autoantigens. Circulating lymphocytes could be sensitized and later stimulated to produce cytopathic effects. There is thus no theoretical limit to the length of time between exposure and disease.

In presenting this case we would like to alert other clinicians to a possible association between previous radiotherapy and fulminant, late, interstitial lung disease.

References