Fatal Respiratory Failure Caused by Pulmonary Infiltration by Pseudo-Gaucher Cells*


Pseudo-Gaucher cells are reticuloendothelial cells that are found in several diseases. We report a case of pulmonary tuberculosis in which extensive pulmonary involvement with these cells resulted in fatal respiratory failure.

(Chest 1992; 101:265-67)

Roentgenographic manifestations of Gaucher’s disease in the lungs consist of a diffuse reticulonodular infiltrate or miliary pattern. This pulmonary involvement is not unusual in the infantile form of Gaucher’s disease, but is uncommon in the adult form.1,2 We report a patient with pulmonary tuberculosis who died of respiratory failure due to extensive involvement of both lungs by cells that were microscopically comparable to what is found in Gaucher’s disease, or so-called pseudo-Gaucher cells.

CASE REPORT

A 30-year-old female immigrant from Pakistan underwent routine medical screening on her arrival in The Netherlands. A chest roentgenogram was obtained, and pulmonary tuberculosis with cavitation in the right upper lobe was diagnosed. She was initially treated with isoniazid, rifampicin, pyrazinamide, and pyridoxine. Based on the sensitivity test results, the treatment regimen was later changed to kanamycin (six weeks), cycloserine, ethambutol, pyrazinamide, and clofazimine. This new approach gradually resulted in some improvement.

Six months later, fever, anemia (hemoglobin, 84 g/L), leukocytopenia (WBC, 4 × 10³/L), and hepatosplenomegaly developed. Except for a slightly elevated alkaline phosphatase level (174 U/L), liver function was normal. A new chest roentgenogram was obtained (Fig 1). Compared to the initial one, there were impressive changes, with widespread infiltrative and nodular lesions in both lungs.

Bone marrow and liver biopsies (Fig 2) were performed. Epithelioid granulomas were found in specimens from both. Auramine staining for mycobacteria was negative. Cultures and laboratory investigations were negative for other infections. Mycobacterium tuberculosis was again found in sputum, whereas cultures of urine, liver, bone marrow, and blood were negative. Because of the clinical suspicion of disseminated tuberculosis, the therapy was changed to kanamycin, rifabutin, ethambutol, and ciprofloxacin. Three days later, the patient died of respiratory failure.

At autopsy, pleural thickening with calcifications was found in the right lung. Cultures revealed M tuberculosis with the same resistance pattern as before. Enlarged lymph nodes were found in the mediastinum and mesentery. The liver and spleen were both very enlarged. Cultures of all other sites were negative. There were no signs of other infections in either the lungs or elsewhere. Microscopy showed large numbers of granulomas with histiocytic cells, characterized by the presence of numerous needlelike structures with a large amount of foamy cytoplasm. These cells were found in the liver, bone marrow, lymph nodes, spleen, and lungs (Fig 3). Special stains for acid-fast bacilli and fungi and even a

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FIGURE 1. Posteroanterior chest roentgenogram depicts cavitation in the right upper lobe and extensive small infiltrative lesions in both lungs.

FIGURE 2. Epithelioid granuloma in liver biopsy specimen obtained a few months before death. Note the large foamy histiocytic cells with striated cytoplasm resembling Gaucher cells (hematoxylin-eosin, original magnification × 560).

FIGURE 3. Lung autopsy specimen displays massive infiltration of pseudo-Gaucher cells in the interstitium of the alveolar walls (hematoxylin-eosin, original magnification × 560).
periodic acid-Schiff stain of these organs were negative. In the lungs there was also an increase of strong acid phosphatase-positive cells in the interstitium of the alveolar walls. Electron microscopy of the spleen showed ceroid-like dark material stored in histiocytic cells; no tubular structures were seen. This resulted in the final diagnosis, infiltration of the lungs by pseudo-Gaucher cells.

**DISCUSSION**

Pseudo-Gaucher cells are reticuloendothelial cells with abundant cytoplasm containing linear striations, resembling the storage cells found in Gaucher's disease. These pseudo-Gaucher cells have been described in various conditions, especially hematologic malignancies, as well as in idiopathic thombocytopenic purpura, aplastic anemia, thalassemia major, multiple myeloma, rheumatoid arthritis, and gangliosidosis. In chronic myelogenous leukemia, the striations are seen at electron microscopy to correspond to cytoplasmic sags filled with linear and amorphous deposits, clearly different from the tubular structures seen in Gaucher cells. The occurrence of pseudo-Gaucher manifestations in the course of atypical mycobacteriosis has been described earlier in an immunosuppressed patient. Our patient with a normal immune system and a multiresistant form of tuberculosis appears to have suffered from this peculiar complication. The cause of this generalized occurrence of Gaucher-like histiocytes may be related to incomplete breakdown of mycobacterial cell walls, and one might speculate whether the extensive infiltration of the reticuloendothelial system also is a reflection of a much more widespread infection than could be proved by cultures during life and at autopsy. Furthermore, it might be possible that the extensive use of a rather uncommon combination of antituberculosis drugs in this patient played a role in the abnormal storage, which ultimately resulted in respiratory failure, as has been described in Gaucher's disease. With regard to this possibility, clofazimine in particular has to be considered, because it is known to accumulate in the tissues and to precipitate as a solid.

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**Upper Lobe Pulmonary Parenchymal Calcification in a Patient with AIDS and Pneumocystis carinii Pneumonia Receiving Aerosolized Pentamidine**


In patients with AIDS-related Pneumocystis carinii infection occurring during aerosolized pentamidine prophylaxis, roentgenographic findings may be atypical. Pulmonary parenchymal calcification due to *P carinii* is rare. In this case, extensive upper lobe pulmonary parenchymal, splenic, and nodal calcifications occurred after two years of monthly treatments with aerosolized pentamidine.

*We report the development of upper lobe relapse with extensive pulmonary parenchymal and lymph node calcifications in a 43-year-old homosexual with AIDS who was receiving aerosolized pentamidine prophylaxis after a previous episode of Pneumocystis carinii pneumonia diagnosed by transbronchial biopsy. Extensive pulmonary calcification during aerosolized pentamidine therapy has not previously been reported and adds to the spectrum of atypical radiographic findings associated with relapse of *P carinii* pneumonia in patients receiving aerosolized pentamidine.*

**CASE REPORT**

A 43-year-old homosexual with AIDS presented with fever, dry cough, and dyspnea. He was a cigarette smoker (50 pack-years) and had no history of previous chest disease or opportunistic infections, including *Pneumocystis carinii* pneumonia. There was no history of exposure to tuberculosis, pathogenic dusts, or fungi. Medications included 300 mg of aerosolized (jet nebulizer) pentamidine monthly for primary prophylaxis and zidovudine. CD4+ cell count was less than 200/μL, and he was normocalcemic. Chest roentgenograms revealed dense upper lobe infiltrates (Fig 1) and calcified hilar lymph nodes. Bronchoalveolar lavage was unrevealing, but transbronchoscopic biopsy demonstrated *P carinii*. Special stains and cultures for all other pathogens including cytomegalovirus, fungi, and Mycobacteria were negative. Pentamidine (4 mg/kg per day) was given intravenously for 21 days, and the symptoms resolved. One month later, the chest roentgenogram showed considerable clearing of the upper lobe infiltrates.

He presented again three months after his first presentation, with fever, productive cough, and dyspnea. Serum calcium concentration was again normal. The chest roentgenogram now showed bilateral upper lobe infiltrates similar to the original finding. Computed tomography (Fig 2) demonstrated extensively calcified consolidated upper lobe infiltrates and small bilateral pleural effusions. Extrapulmonary calcification was also noted in the mediastinal and hilar lymph nodes and spleen. Repeat BAL was negative.

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