Xenon-133 Evidence of Bronchopleural Fistula Healing during Treatment of Mixed Aspergillus and Tuberculous Empyema

Morton S. Skorodin, Gregory A. Gergans, James R. Zvetina, and John R. Siever

Veterans Administration Hospital, Hines, Illinois, Loyola University Medical School, Maywood, Illinois, and Abraham Lincoln School of Medicine, University of Illinois, Chicago, Illinois

We present a case of mixed empyema with bronchopleural fistula due to Mycobacterium tuberculosis, Aspergillus fumigatus, and Aspergillus flavus, which resolved under multiple antituberculous drugs and intrapleural amphotericin B. The bronchopleural fistula and its subsequent closure were documented by xenon-133 ventilation lung scans.


Pleural aspergillosis occurs often in association with bronchopleural fistula and is characterized by empyema. It may develop following a spontaneous pneumothorax or as a postoperative complication of lung resection for cancer, tuberculosis, or aspergilloma (1–4). Treatment of empyema due to aspergillosis has included surgical approaches as well as intrapleural and intravenous administration of antifungal agents (1–5).

We present a patient with mixed empyema and bronchopleural fistula due to Mycobacterium tuberculosis, Aspergillus fumigatus and Aspergillus flavus, successfully treated with instillation of amphotericin B into the pleural cavity and daily antituberculous drug therapy. Because surgical intervention was initially considered, a ventilation scan was obtained to assess the relative contribution of each lung to total pulmonary function (6). The initial xenon-133 ventilation scan proved valuable in demonstrating the bronchopleural fistula. Two months later, a second ventilation scan demonstrated resolution of the fistula.

CASE REPORT

A 46-year-old black male developed chest pain and shortness of breath in January, 1980. He had a previous history of pulmonary tuberculosis with bilateral apical cavities. He went to a private hospital where a right-sided pneumothorax was diagnosed and a chest tube was inserted. He was then transferred to our hospital, where he was found to be acutely and chronically ill. He had fever, productive cough, decreased breath sounds over the right hemithorax and the left upper lung field, anemia, hypoalbuminemia, and the syndrome of inappropriate ADH. Chest radiograph showed a right pneumothorax with chest tube in place. Large cavities were also noted in both upper lung fields, with multiple fungus balls (Fig. 1). In addition, he was found to have a bronchopleural fistula with continuous air leak and drainage of purulent fluid through the chest tube. Pleural-fluid culture yielded growth of Mycobacterium tuberculosis, Aspergillus fumigatus, and Aspergillus flavus. Sputum culture yielded M. tuberculosis. Fungal immunodiffusion was positive for Aspergillus antigens with two lines. He was treated with several antituberculous drugs. Despite continuous suction, air leak persisted. A xenon ventilation

FIG. 1. Chest radiograph (2/25/80) demonstrating right-sided pneumothorax in addition to large upper-lobe cavities containing multiple mycetomas.
The scintiphoto series was obtained for a preoperative evaluation (Fig. 2). The scintiphotos demonstrated the unique finding of retention of Xe-133 in the right pleural space. Surgery was initially contemplated but was deferred, and the patient was treated with instillation of amphotericin B through the chest tube. These irrigations were given once daily and consisted of 25 mg in 35 ml of 5% dextrose in water, the solution being permitted to remain in the pleural space for 1 hr, with the tube clamped. A total of 575 mg of amphotericin B was administered over a 4-wk period. He became afebrile and the bronchopleural fistula closed during this time, as showed by clinical and radiographic evidence. In addition, the follow-up ventilation scintiphoto no longer demonstrated peripheral retention of xenon (Fig. 3). His sputum subsequently became negative for tuberculous organisms and he has continued to do well.

DISCUSSION

Over sixty cases of pleural aspergillosis have been recorded in the literature. Several treatments have been used, often successfully, including intrapleural and parenteral amphotericin B and intrapleural nystatin as well as various surgical procedures (1–5). It has recently been asserted that surgery is required for successful treatment of pleural aspergillosis (2). Our patient, with simultaneous pleural tuberculosis and aspergillosis, responded without requiring surgery or intravenous amphotericin. He had no problem with renal dysfunction or fever, as may occur with amphotericin administered intravenously (7).

Of considerable interest are the ventilation scans in this case. There was retention of Xe-133 in the pleural space on the right, indicating bronchopleural fistula at the time of xenon inhalation (8–11). In a subsequent lung scan no retention of the radioxenon was observed in the pleural space, demonstrating closure of the bronchopleural fistula following successful treatment.

REFERENCES