Case Report

Cavitary Lung Carcinoma Complicated with Intracavitary Aspergillosis

Akihiko Kitami, Takashi Suzuki, Yoshito Kamio and Shuichi Suzuki

Abstract: Pulmonary aspergillosis and lung cancer rarely occur simultaneously. We report a 51-year-old male with cavitary lung carcinoma, in which aspergillus fumigatus was detected in the resected lung. The patient underwent a left upper lobectomy and lymph node dissection at the diagnosis of cavitary lung carcinoma. Microscopic examination revealed the wall of the cavity to be poorly differentiated squamous cell carcinoma, and a cavity containing a dark yellowish-gray mass to be branching septate hyphae consistent with Aspergillus. We consider from this and other reported cases that careful examination and observation are necessary in cases with pulmonary cavitary lesion, even if the cavitary lesion has been diagnosed as aspergillosis.

Key words: lung carcinoma, aspergillosis

Introduction

Pulmonary aspergilloma is a frequent complication of diseases that cause intrapulmonary cavities, yet the simultaneous appearance of both bronchogenic carcinoma and aspergilloma is rare. We present a case of cavitary lung carcinoma, in which aspergillus fumigatus was detected in the resected specimen.

Case

A 51-year-old male was admitted to Showa University Fujigaoka Hospital in February 1997 because of an abnormal shadow on chest X-ray film. The patient had had some episodes of sputum cruentum since 1994. He had smoked about two packs of cigarettes per day for 30 years. He had a past history of asthma and peptic ulcer. The patient had fever on admission, but he became afebrile after administration of antibiotics. Laboratory studies upon admission revealed iron deficiency anemia (Hb 9.3 g/dl, Fe 11 μg/dl), leucocytosis of 9800/μl, and elevation of C-reactive protein (2.3 mg/dl). Carcinoembryonal antigen was slightly elevated (10.0 ng/dl), but other tumor markers were within normal limits. The chest X-ray film upon admission showed a cavitary lesion with a relatively thin wall in the left upper lung field (Fig. 1). The chest computed tomography (CT) scan revealed a cavity lesion within the mass material (Fig. 2).

Infiltrative shadow of lung and lymphadenopathy were not shown in the chest CT. Sputum cultures detected anaerobic bacteria, but tubercle bacilli was negative. The

Department of Thoracic and Cardiovascular Surgery, Showa University Fujigaoka Hospital, 1-30 Fujigaoka, Aoba-ku, Yokohama 227-8501, Japan.
Fig. 1. Chest X-ray film upon admission showing a cavitary lesion with a relatively thin wall in the left upper lung field.

Fig. 2. Chest CT scan revealing a cavity lesion within the mass material.

tuberculosis skin test was positive (35 mm at 48 hours). Sputum cytological studies and bronchial washing/curetting demonstrated atypical cells (class V adenocarcinoma). From these findings, we diagnosed lung adenocarcinoma (c-T2N0M0 Stage IB). The patient underwent a left upper lobectomy and lymph node dissection in March 1997. The pathologic specimen disclosed a cavity (43×25×35 mm) containing a dark yellowish-gray mass, blood coagulation and sanguinopurulent debris. The culture of this debris revealed anaerobic bacteria (Eubacterium species), and the dark yellowish mass demonstrated branching septate hyphae pathologically consistent with Aspergillus (Fig. 3a). The wall of the cavity was whitish-gray and moderately firm, and microscopic examination revealed it to be poorly differentiated squamous cell carcinoma (Fig. 3b). The patient was alive and well, without evidence of lung carcinoma or aspergillosis at 1 year and 8 months after the surgery.
Lung Carcinoma Complicated with Aspergillosis

Fig. 3. Histological finding of the resected specimen. a) Poorly differentiated squamous cell carcinoma of the cavitary wall. b) Branching septate hyphae consistent with Aspergillus in the cavity.

Discussion

Disease caused by aspergillus species can be manifested in three different ways: As a saprophytic infection within cavities (aspergilloma); as an allergen that initiates such entities as allergic bronchopulmonary aspergillosis (ABPA), asthma and extrinsic allergic alveolitis; and as a true pathogen that can cause either acute invasive pulmonary aspergillosis or a more chronic necrotizing form of disease.1

Although aspergilloma, or an intracavitary fungus ball, is not rare in cavities such as healed tuberculosis, bronchiectasis and bronchial cysts, the simultaneous appearance of both bronchogenic carcinoma and aspergilloma is rare. Smith and Beneck summarized only ten cases of saprophytic aspergillosis in lung carcinoma in 1991, and Tanaka et al summarized six Japanese cases in 1993.2 These cases reported in the literature had distinct clinical characteristics. First, the patients were all male and almost all were smokers, who were not in an immunosuppressed state except for lung carcinoma. Second, although most cases had an episode of sputum cruentum, no patient has developed massive hemorrhage as a complication of this condition. Smith and Beneck explained this as the result of a shorter period of fungal colonization in the lung tumor.3 Third, almost all cases had a diagnosis
of lung carcinoma before the operation, however, only half of the cases were diagnosed as aspergillosis after the operation. The present case had a clinical diagnosis of lung carcinoma based on sputum cytological study, and was suspected to have accompanying infection of anaerobic bacteria, but the diagnosis of aspergillosis was not ascertained before operation.

Although the mechanism of simultaneous appearance of bronchogenic carcinoma and aspergilloma is unclear, we assumed that in this case aspergilloma developed secondary in the cavity of the carcinoma, because the cavity wall was entirely composed of squamous cell carcinoma.

In the radiographic findings of this disease, most cases revealed a cavitary lesion within the mass material, but fungus ball formation is not so common. Fujimoto et al described the characteristics on MR images of the aspergilloma within cavitary lung cancer\(^4\). They described the differences in signal intensity between the intracavitary fungus ball and the viable tumor of the cavity wall on T1- and T2-weighted images. Moreover, the possibility of distinction between aspergilloma itself and liquefactive necrosis based on MR image findings has been suggested. Though this patient did not undergo MR imaging examination, it may become useful for the discrimination of pulmonary cavitary lesions after this.

Although most of the cases had a diagnosis of lung carcinoma before the operation as mentioned above, we noted that two of the previously described patients initially only had a diagnosis of aspergillosis. One of them underwent anti-aspergillosis therapy for about two years before operation\(^5\). The other patient received only anti-aspergillosis therapy, and the diagnosis of lung carcinoma was obtained at necropsy\(^6\). These results suggest that careful examination and observation are necessary in cases with pulmonary cavitary lesion, even if the cavitary lesion has been diagnosed as aspergillosis.

References


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