Mucoid Impaction Caused by Monokaryotic Mycelium of *Schizophyllum commune* in Association with Bronchiectasis

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**Abstract**

A 51-year-old female was admitted to our hospital because of fever, cough, and hemoptysis. A chest radiograph showed a partial collapse of the left upper division and infected bullae in the left upper lobe. Bronchoscopic examination showed thick mucous plugs in the left upper bronchus. The isolates of the plugs proved to be *Schizophyllum commune*. Neither accumulation of eosinophils nor Charcot-Leyden crystals were present in the plugs. Mild ectatic changes of the left upper bronchus had been observed 17 years previously. We describe the first case of mucoid impaction, which was independent of the immunological reactions, caused by *S. commune* in association with bronchiectasis.

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**Key words:** hypersensitivity reactions, minimal inhibitory concentrations, amphotericin B, itraconazole

**Introduction**

*S. commune*, a basidiomycetous fungus, is ubiquitous in the environment and has been considered to be nonpathogenic to humans. Reports of infection caused by *S. commute* are rare (1-4). Reports involving the lung include cases of allergic bronchopulmonary mycosis (ABPM) in healthy female (5, 6) and fungus ball of the lung (4). To our knowledge, no basidiomycete has been reported from a case of mucoid impaction in association with bronchiectasis.

**Case Report**

A 51-year-old Japanese female was referred to our hospital three months before admission for cough and hemoptysis. Radiographs and CT scan of the chest showed a partial collapse of the left upper division and large bullae with niveau occupying the left upper lobe. We diagnosed the case as infected bullae and treated the patient with oral administration of levofloxacin (300 mg daily). Her symptoms disappeared without improvement of a partial collapse as observed on chest films. Bronchoscopic examination revealed thick white-yellowish mucous plugs in the left upper lobe bronchus which were removed. Cultures of the plugs yielded growth of fungi, which was not identified as *Aspergillus sp.* Microscopic examination of the plug smear and the bronchial washing fluid revealed massive clumps of mycelia with some necrotic tissue, and no accumulation of eosinophils or Charcot-Leyden crystals. And microscopic analysis of the mycelia disclosed uncharacteristic septate hyphae branching at right angles. Oral itraconazole (200 mg daily) was begun one month before admission. However, fever and cough developed one week before admission.

Seventeen years previously, she underwent a segmentectomy of the lingular lobe due to severe hemoptysis due to bronchiectasis. She had no history of bronchial asthma.

Her temperature was 38.2°C. Physical examination was negative except that the breathing sound was diminished over the upper one-third of the left lung.

WBC count was increased to 10,700/mm³ with no eosinophilia. Results of blood chemistry analysis were normal. A radioimmunosorbent test revealed normal IgE levels. Precipitating antibodies to *A. fumigatus* were undetectable by the Ouchterlony test. Pulmonary function tests revealed that the vital capacity (97.4%) and the forced expiratory volume in 1 second (87.1%) were normal. Chest roentgenogram and CT scan on admission demonstrated a partial collapse of the left upper division and infected bullae in the left upper lobe (Figs. 1, 2). Bronchogram of the left bronchi taken 17 years ago prior to the lingular segmentectomy revealed ectatic changes of the bronchi of the lingular and also the left upper division (Fig. 3).

On mycological study, cultures of the plugs showed white, felt-like appearance and a pronounced odor, but no spores were observed. Minute spicular formations were seen on hyphae. As the isolate was suspected to be *S. commute*, mating tests

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Figure 1. Chest roentgenogram on admission showed partial collapse and large bullae with fluid level occupying the left upper lobe.

Figure 2. Chest CT scan on admission showed obstruction of the left upper bronchus and infected bullae.

Figure 3. Bronchogram of the left bronchi prior to a lingular segmentectomy, taken 17 years previously, revealed ectatic changes of the bronchi of the lingular and also the left upper division.

Figure 4. White-yellowish, fan-shaped basidiocarps with a short stipe grew at the peripheral zone of the clinical isolate of S. commune, when it was cocultured with the seven tester monokaryotic strains on plates of potato dextrose agar.

were performed. The clinical isolate was inoculated onto plates opposite each tester monokaryotic strain of S. commune; it was dikaryotized and produced basidiocarps (Fig. 4). Also, when cocultured with a dikaryotic strain, it was dikaryotized and produced basidiocarps. On the basis of these mating behaviors, the isolate was identified as the monokaryotic mycelium of S. commune, and it was taken to the Research Center of Pathogenic Fungi and Microbial Toxicses, Chiba University with an IFM number of 47583. Titer of serum antibody to S. commune cytosol antigen was positive before administration of itraconazole as determined by ELISA methods described previously (5).

A diagnosis of mucoid impaction caused by the mono-
karyotic mycelium of *S. commune* infection in association with preexistent bronchiectasis was made. Treatment was begun with amphotericin B (AMPH-B) (1 mg/kg, IV) for one month. Her symptoms, a partial collapse and an infected bullae, gradually improved (Fig. 5). At 16 months after cessation of therapy, no recurrence of infection has occurred.

**Discussion**

Human infections caused by *S. commune* are rare, but several cases of pathology caused by this fungus have been reported such as involvement of brain (7), accessory nasal sinus (8), lung (4), hard and soft plate (2) and nail (1). In addition, the role of *S. commune* in allergic disorders of the lung and the accessory nasal sinus has been indicated (5, 9).

In this case, mild ectatic changes of the left upper bronchus had already been revealed by bronchogram 17 years previously. This case showed normal IgE levels with no eosinophilia. Neither accumulation of eosinophils nor Charcot-Leyden crystals were present in the mucous plugs. Several reports involving the lung were described as cases of allergic bronchopulmonary mycosis (ABPM) (5, 6). However, the above-mentioned findings suggested that she had only mucoid impaction independent of hypersensitivity reactions caused by *S. commune* in association with bronchiectasis. We believe this is the first case of mucoid impaction in association with bronchiectasis caused by the monokaryotic mycelium of *S. commune*.

The role of antifungal therapy in the treatment of *S. commune* infections is controversial. The minimum inhibitory concentration (MIC) (Eagle's minimal essential medium was used) of itraconazole, AMPH-B, and fluconazole against the patient's isolate were 0.125, 0.39, and 12.5 µg/ml, respectively. Administration of AMPH-B were reported to be effective (8, 10). In this case, oral itraconazole (200 mg daily) for one month was ineffective although MIC was within the therapeutic ranges. There may also be a role for treatment with corticosteroid, but steroid therapy was not initiated because this was not a case of allergic lung disease. Therefore, she was successfully treated with AMPH-B following an unsatisfactory response to itraconazole. She has had no recurrence for 16 months after cessation of therapy.

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**References**