Pulmonary aspergillosis due to *Aspergillus terreus* combined with staphylococcal pneumonia and hepatic candidiasis

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Abstract

A female patient with systemic lupus erythematosus (SLE) developed pulmonary aspergillosis with staphylococcal pneumonia and hepatic candidiasis. *Aspergillus terreus*, which is a rare causative organism of pulmonary aspergillosis, was identified from a pulmonary lesion by culture. The aleurioconidium production, a characteristic of the genus *Aspergillus* sect. *terrei*, was demonstrated on short and irregular hyphal features in tissue sections. This report is the first of a combined case of pulmonary aspergillosis due to *A. terreus* with infections caused by other microorganisms.

Introduction

Pulmonary aspergillosis is not uncommon as a terminal complicating infection. Of the many species of Aspergillus, the most commonly responsible pathogens for invasive aspergillosis in humans are *A. fumigatus*, *A. flavus* and *A. niger* [1]. Members of other species are rarely identified. *Aspergillus terreus* is one such rare pathogen of deep mycosis: only three cases of pulmonary infection caused by *A. terreus* have been reported [6, 9, 19], one of which included a precise pathological documentation [19]. In the present report, we describe for the first time a combined case of pulmonary aspergillosis caused by *A. terreus* with hepatic candidiasis and pneumonia due to *Staphylococcus aureus*.

Case history

A 37-year-old Japanese female with a twelve-year history of SLE remained well with corticosteroid therapy until March in 1988 when she presented with general edema. She was hospitalized for a month for the treatment of cerebral bleeding in 1985, details of which are unclear. She was started on blood dialysis on March 27, 1988, due to chronic renal failure. Antinuclear antibodies were positive at a dilution of 1:10 and showed a diffuse pattern. Direct and indirect Coomb's tests, RNP, Sm and ENA antibodies had negative results at that time. On the tenth day of dialysis her condition deteriorated, and CT scan showed cerebral infarction of the left posterior lobe. She responded to blood dialysis and pulse therapy of
corticosteroid, and her condition gradually improved. On August 31, the patient suddenly had a convulsion and lost consciousness. Respiration was controlled artificially through use of a tracheotomy. White cell count at that time was 1000 cells/µl. Cultures of the patient’s blood were negative, but broad-spectrum antimicrobial chemotherapy was continued to prevent infection. On September 28, she again had a general convulsion, and she died on October 2, 1988.

**Autopsy findings**

The lungs weighed 750 g (left) and 650 g (right). Both lungs were edematous. Yellowish white nodules measuring 1 to 6 mm in diameter were scattered on the cut surfaces of the lungs. The right upper and middle lobes were almost entirely consolidated and some other lobes showed segmental consolidation. Histological examination of both types of lesions revealed bronchioles and alveoli diffusely infiltrated by large numbers of polymorphonuclear leucocytes. Colonies of gram-positive cocci were irregularly scattered in these lesions. Cultures from the tissues confirmed the organisms as *Staphylococcus aureus*.

Sections through a nodule, 10 mm in diameter, in the left lower lobe contained a small amount of cream-like material; histologically, it consisted of amorphous necrotic material with masses of fungal hyphae and a number of cocci. The hyphae continuously proliferated to the visceral pleura causing focal pleuritis (Fig. 1). Both *Aspergillus terreus* and *Staphylococcus aureus* were cultured from the creamy material. Inflammatory cell infiltration, mainly polymorphonuclear leucocytes was scarce in the necrotic and pleural lesions, but lung tissue surrounding the lesion was filled with polymorphonuclear leucocytes. Numerous hyphal elements were detected in the surrounding tissue. Phagocytosis of some hyphal elements by multinucleated giant cells were also observed. In the necrotic and the surrounding tissue, hyphae were short and sometimes curving. Their branching was random, and abundant septa were distributed at irregular intervals of 2 to 8 µm along the hyphae, some of which were swollen. Small lateral conidia, also called aleurioconidia, attached to the hyphae directly or by short conidiophores (Fig. 2). On the other hand, hyphae in the pleural lesion exhibited typical morphological features of the genus *Aspergillus* (Fig. 3): they had parallel contours, and the pattern of branching was progressive. The hyphal branches had the same caliber as the parent hyphae from which they arose. All hyphae and conidia were stained positive by the ABC method using rabbit anti-*Aspergillus* antiserum (Fig. 4). The tracheal wall showed ulceration at the site of the tracheotomy. *S. aureus* was also cultured from the ulcerated lesions.

The weight of the liver was 1110 g. The cut

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*Fig. 1*. Fungal elements are seen throughout the necrotic and surviving pulmonary tissue. Hyphae are proliferating through the pleura (arrow) (GMS, × 200).