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Medical Imagery

Secondary pneumothorax due to *Aspergillus welwitschiae* in a lung transplant recipient

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A 57-year-old female who received prophylactic oral itraconazole for 2 years after bilateral lung transplantation for diffuse panbronchiolitis presented during scheduled outpatient follow-up. A chest computed tomography scan accidentally revealed a right pneumothorax without evidence of cavitary lesions (Figure 1), which was not observed 3 months previously. Although bronchoscopic examination revealed no significant pathological findings in the respiratory tract, microbiological analysis of sputum specimens demonstrated persistent colonization with *Aspergillus niger*. Serological testing indicated a slight elevation in serum galactomannan antigen index to 0.6. These findings suggested post-transplantation pulmonary aspergillosis, possibly Aspergillus tracheobronchitis, as the underlying etiology of the secondary pneumothorax. After initiation of antifungal therapy with intravenous caspofungin, *A. niger* was eradicated from the sputum and the pneumothorax resolved.

Later, PCR amplification of the calmodulin gene was performed, and the isolate was identified as *Aspergillus welwitschiae*, showing 100% sequence homology with the reference strain (GenBank accession number: LC570775). Based on the Clinical and Laboratory Standards Institute method (M38), minimum inhibitory concentrations of antifungal agents were determined as follows; ≤0.015 μg/mL for micafungin, 0.125 μg/mL for caspofungin, 2 μg/mL for amphotericin B, 4 μg/mL for itraconazole, 2 μg/mL for voriconazole, >8 μg/mL for isavuconazole, and 0.5 μg/mL for posaconazole.

A. welwitschiae belongs to *Aspergillus* section *Nigri*, representing approximately 50% of species within this taxonomic group [1]. This species has been isolated from various agricultural sources, including onion bulbs, garlic, and other food commodities [2]. It reportedly represents the predominant etiological agent of otomycosis, accounting for approximately 40% of cases [3]. *A. welwitschiae* accounts for 10% of overall clinical *Aspergillus* isolates, with predominant detection from the lower respiratory tract of patients with chronic pulmonary disorders [1,4]. Morphological differentiation among species within *Aspergillus* section *Nigri* is not feasible, resulting in routine clinical reporting as *A. niger* [5]. *A. welwitschiae* commonly demonstrates resistance to azole antifungals [6,7], with the primary resistance mechanism being attributed to the overexpression of the *cyp51A* gene [8]. This case highlights the potential of *A. welwitschiae* to cause breakthrough pulmonary infection manifesting as pneumothorax despite prophylactic itraconazole therapy.

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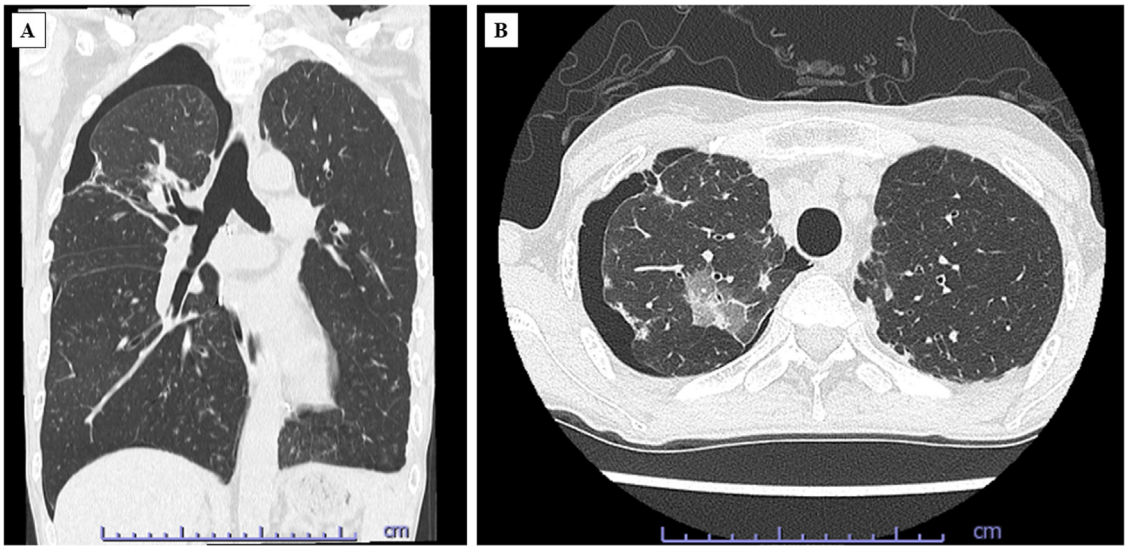

Figure 1. Finding of computed tomography (CT). (A) Coronal section. (B) Axial section. Chest CT shows a mild right pneumothorax and a ground-glass opacity in the right upper lobe without a cavity lesion. Bronchiectasis due to diffuse panbronchiolitis was bilaterally observed.

Author contributions

SF drafted and HH revised the manuscript; ST and SS managed the patient; SB, TY, AW were responsible for the microbiological investigation. All authors gave final approval to the submitted manuscript.

Declarations of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article. The author is an Editorial Board Member/Editor-in-Chief/Associate Editor/Guest Editor for (Journal name) and was not involved in the editorial review or the decision to publish this article.

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Availability of data and materials

The datasets used during the current study available from the corresponding author on reasonable request. The isolate was deposited as IFM 69725 at the Medical Mycology Research Center, Chiba University through the National Bio-Resource Project, Japan.

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