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CORRESPONDENCE

Diagnostic role of an oligonucleotide array in a heart transplantation patient with invasive pulmonary aspergillosis



Dear Editor,

Invasive mycoses remains an important issue for immunocompromised patients based on recent studies.^{1,2} Early diagnosis of invasive aspergillosis is especially essential to a favorable outcome because the mortality rate is as high as 70%.³ For rapid identification of molds, an oligonucleotide array was developed based on the internal transcribed

spacer-1 (ITS-1) and ITS-2 sequences of the rRNA genes.⁴ The array can identify 64 species of fungi with a high sensitivity (98.3%) and specificity (98.1%). However, its usefulness for direct detection of fungi in clinical specimens has not been approved. Therefore, we presented a patient as clinical experience of the application of oligonucleotide array for rapid diagnosis of invasive pulmonary

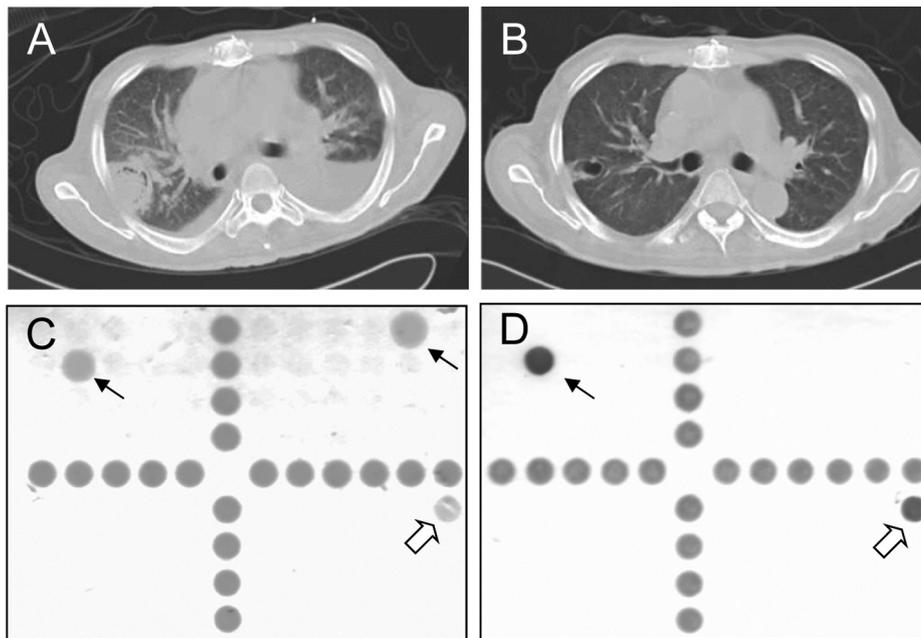


Figure 1. (A) Computed tomography shows a ball-in-hole lesion on the right lower lung. (B) After 3 months of voriconazole therapy, the lung lesion resolved. (C) Direct detection of fungi in sputum by the oligonucleotide array. The signals of *Aspergillus fumigatus* (right) and *Aspergillus terreus* (left) are indicated by the arrows, while the hollow arrow indicates the positive control. (D) Identification of the fungus isolated from sputum by the array. The signal of *A. terreus* is indicated by the arrow, while the hollow arrow indicates the positive control.

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aspergillosis. The study was approved by the Institutional Review Board of National Cheng Kung University Hospital, Tainan, Taiwan (Number: B-ER-101-071).

A 44-year-old man with dilated cardiomyopathy was hospitalized due to congestive heart failure. He received heart transplantation, and the hospital course was complicated by candidemia, *Enterococcus* bacteremia, *Enterobacter cloacae* bacteremia, acute kidney injury requiring renal replacement therapy, bleeding at left pararenal space, and hemoperitoneum intervened by transcatheter arterial embolization, and ventilator-associated pneumonia. Follow-up computed tomography (CT) revealed left pararenal and perisplenic hematoma and right lung consolidation. Sputum culture isolated *Stenotrophomonas maltophilia* and a mold. Chest CT 13 days after the first CT, demonstrated a cavitory lesion over the right lower lung (Figure 1A). The index of the optical density of *Aspergillus* galactomannan determined by a kit (Platelia *Aspergillus* EIA; Bio-Rad, Marnes-la-Coquette, France) in serum and bronchoalveolar lavage fluid was 2.1 and 7.17, respectively. Voriconazole was prescribed and gradual improvement was shown on CT galactomannan (Figure 1B). The patient was discharged without sequel. Using the array, *Aspergillus fumigatus* and *Aspergillus terreus* were detected in the sputum (Figure 1C). Sputum fungal culture reported the isolates of *Aspergillus* species after 26 working days. The colony was identified as *A. terreus* by the oligonucleotide array (Figure 1D) and ITS sequencing.⁴

The galactomannan immunoassay is one of diagnostic methods for invasive aspergillosis, but the results might not be rapidly available. By contrast, the oligonucleotide array can provide the result within 24 hours⁴ and can be a supplementary tool in the diagnosis of invasive aspergillosis. In addition, the array found two *Aspergillus* species (*A. fumigatus* and *A. terreus*), but only "*Aspergillus* species" was reported from the clinical microbiology laboratory. The fungal isolate was later identified as *A. terreus* by the oligonucleotide array and by ITS gene sequencing. It is possible that there were actually two *Aspergillus* species in the culture plate, and only the colony of one species was picked for further identification, or *A. terreus* overgrew.

In conclusion, we present a case of heart transplantation with invasive pulmonary aspergillosis, and with the aid of oligonucleotide array rapid diagnosis of invasive aspergillosis and early initiation of appropriate antifungal therapy could be possible.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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113002). We certify that we have no conflict of interest in connection with this article.

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