Rapid progression of *Candida tropicalis* in a case with severe sepsis

Kota Hoshino, Mariko Mizunuma, Reiko Yamasaki, Norihiko Matsumoto, Yuhei Irie, Hiroyasu Ishikura

Department of Emergency and Critical Care Medicine, Fukuoka University Hospital (7-45-1 Nanakuma, Jonan-ku, Fukuoka 814-0180, Japan)

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**Introduction**

Disseminated candidiasis is defined as *Candida* infection in multiple organs, with or without positive blood culture results. We report a case in which disseminated candidiasis was diagnosed at autopsy.

**Presentation of case**

A 63-year-old Japanese man, who was not in an immunocompromised state preoperatively and not clinically diagnosed with *Candida*, underwent super-low anterior resection for rectal cancer. On the day after surgery, an emergency re-operation was required because of rectal anastomotic leakage. Hartmann’s operation was performed because it was impossible to check the area of anastomosis. After re-operation, the patient was transferred to our ICU with multiple organ failure (MOF), septic shock, acute respiratory distress syndrome, disseminated intravascular coagulation, and acute kidney injury. The procalcitonin level was >100 ng/ml, whereas β-D-glucan level was 19 pg/ml on ICU admission. Biapenem 1,200 mg, intravenous immunoglobulin 5 g, noradrenaline 0.6 μg/kg/min, recombinant thrombomodulin 380 U/kg, and methylprednisolone 1 mg/kg/day for adrenal insufficiency were administered through a central venous catheter. Continuous hemodiafiltration and polymyxin B-immobilized fiber column direct hemoperfusion were performed. *Escherichia coli*, *Enterococcus faecalis*, and *Clostridium* species were found in ascites culture; however, blood culture was negative on day 1 of ICU admission. A small amount of *Candida tropicalis* (*C. tropicalis*) was detected on sputum culture on day 4 of ICU admission. In addition, *C. tropicalis* colonization spread to urine and stool during the clinical course. The procalcitonin level decreased (day 8: 9.8 ng/ml); however, the patient’s MOF was exacerbated. He died on day 11 of ICU admission.

On autopsy, the sigmoid colon showed necrosis, and the site of the anastomosis was fragile. There were *Candida* abscesses around the sigmoid colon. Multiple organs (heart, lung, liver, spleen, kidney, and mesentery) were infiltrated by *Candida* (*Fig. 1*). *C. tropicalis* was histologically identified by Grocott staining.

**Discussion**

Non-albicans *Candida* infections have been increasing in recent years, and *C. tropicalis* is more invasive than *C. albicans*. In addition, the morbidity and mortality rates associated with *C. tropicalis* infection are higher than those associated with *C. albicans* infection. Disseminated *C. tropicalis* infections have been reported in patients with cancer, hematological malignancy, and bone marrow transplants and neonatal patients admitted to ICU.

In our case, the patient’s MOF was exacerbated after the occurrence of anastomotic leakage because of the invasion of *C. tropicalis* from the anastomotic region was identified at autopsy. Because the procalcitonin level was decreasing, we hypothesized that a microbial bacterial-to-fungal substitution resulted in the rapid progression of the patient’s illness. The disseminated *C. tropicalis* infection occurred rapidly after surgery despite the patient being non-immunocompromised and not showing any signs of *Candida* infection before surgery. To the best of our knowledge, no other such cases have previously been reported in the literature.

Although the ideal timing for antifungal administration in critically ill patients has not yet been identified, empirical antifungal administration should be considered when patients are deemed to be at high risk of *Candida* infections, although *Candida* infections have not yet been diagnosed. The *Candida* score was reported as a bedside scoring system in critically ill patients with *Candida* colonization, and a cut-off value of 2.5, with a sensitivity of 81% and specificity of 74%, indicated *Candida* infection. In this case, *Candida* colonization was detected on day 4 of ICU admission, although there were no overt clinical signs of fungal infection. We
believe that empirical antifungal administration should have immediately been initiated because the Candida score was already 3 at that time.

There are no definitive criteria for empirical antifungal drug therapy administration. Non-albicans Candida tends to be resistant against fluconazole\(^9\); therefore, other antifungal drugs may be selected on the basis of facility-specific antibiograms.

**Conclusion**

Disseminated candidiasis after rectal anastomotic leakage rapidly progressed in the above case; therefore, antifungal therapy was not administered in time. This case illustrates the importance of considering empirical antifungal administration in patients at high risk of Candida infections.

**Conflict of interest statement**

None.

**References**