Candida peritonitis

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Candida peritonitis

Candida peritonitis is frequent, representing up to 71% of invasive Candida infections in surgical ICUs

Information on the species causing Candida peritonitis, their in vitro susceptibility, antifungal strategies in this setting and patient outcome is still scarce

Leroy O, Gangneux JP, Montravers P et al. Epidemiology, management, and risk factors for death of invasive Candida infections in critical care: a multicenter, prospective, observational study in France (2005–2006). Crit Care Med 2009; 37: 1612–1618.

Candida peritonitis

Candida peritonitis can result from

- **colonization of indwelling catheters used for CAPD**
- **GI perforation due to ulcers, diverticular colitis, surgery or intra-abdominal neoplasm.**

Symptoms include

- **fever, abdominal pain, tenderness**
- **cloudy peritoneal dialysate containing greater than 100 leukocytes/mm3.**

Candida peritonitis usually remains localized to the abdominal cavity unless patients are severely immunosuppressed.

Candida peritonitis

Invasive Candida infections are associated with high mortality, especially in intensive-care units (ICUs)

Both rapid initiation of appropriate antifungal therapy and efficient source control are essential for their treatment and have been shown to reduce mortality

Candida peritonitis

Major risk factors for Candida peritonitis include

hollow viscus perforation,
abdominal and thoracic surgery,
surgical drains in situ,
intravenous and urinary catheters,
severe sepsis,
extensive Candida colonization

This infection is uncommon following simple perforations or when appropriate repair is achieved on the first intervention. However, presence of persistent dehiscence or multiple surgical interventions significantly increases the risk.

Table 1. Clinical Factors Predicting Failure of Source Control for Intra-abdominal Infection

Delay in the initial intervention (>24 h)
High severity of illness (APACHE II score ≥15)
Advanced age
Comorbidity and degree of organ dysfunction
Low albumin level
Poor nutritional status
Degree of peritoneal involvement or diffuse peritonitis
Inability to achieve adequate debridement or control of drainage
Presence of malignancy

NOTE. APACHE, Acute Physiology and Chronic Health Evaluation.

Candida peritonitis

ORIGINAL ARTICLE MYCOLOGY

A multicentre study of antifungal strategies and outcome of *Candida* spp. peritonitis in intensive-care units

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Montravers et al for the AmarCand study group

Montravers et al A multicentric study of antifungal strategies and outcome of Candida Peritonitis in ICU for the AmarCand study group Clinical Microbiology and Infection

Volume 17, Issue 7, pages 1061–1067, July 2011

AmarCand a prospective, non-interventional study
271 adult ICU patients with proven invasive Candida infection who received systemic antifungal therapy (France, 2005-2006).

93 (median age 65 years, SAPS II 52) had Candida peritonitis, including 73 nosocomial peritonitis, 53 concomitant bacterial peritoneal infections and 26 candidaemias.
Candida species were
C. albicans (58%), C. glabrata (20%),
C. krusei (n = 9), C. kefyr (n = 5), C. parapsilosis (n = 3), C. tropicalis (n = 3), C. ciferii (n = 2) and C. lusitaniae (n = 1).

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28% were fluconazole-resistant or susceptible dose-dependent (C. albicans 3/32, C. glabrata 9/14, C. krusei 4/4).

Empiric antifungal treatment was started 1 day (median) after peritonitis diagnosis, with fluconazole (n = 2 patients), caspofungin (n = 12), voriconazole (n = 3), amphotericin B (n = 2), or a combination (n = 4).

Peritonitis was diagnosed on the basis of macroscopic findings and direct examination or positive culture for Candida of the peritoneal fluid collected during operation.
Candidaemia was defined by at least one positive blood culture.
Candida peritonitis was considered as nosocomial if diagnosed > 48 h after hospitalization or community-acquired (<48 h)

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Following susceptibility testing, empiric antifungal treatment was judged inadequate in 9/45 (20%) patients and modified in 30 patients
(fluconazole was replaced by caspofungin (n = 14) or voriconazole (n = 4)).
Mortality in ICU was 38% (35/93) and was not influenced by type of Candida species, fluconazole susceptibility, time to treatment, candidaemia, nosocomial acquisition, or concomitant bacterial infection. care.

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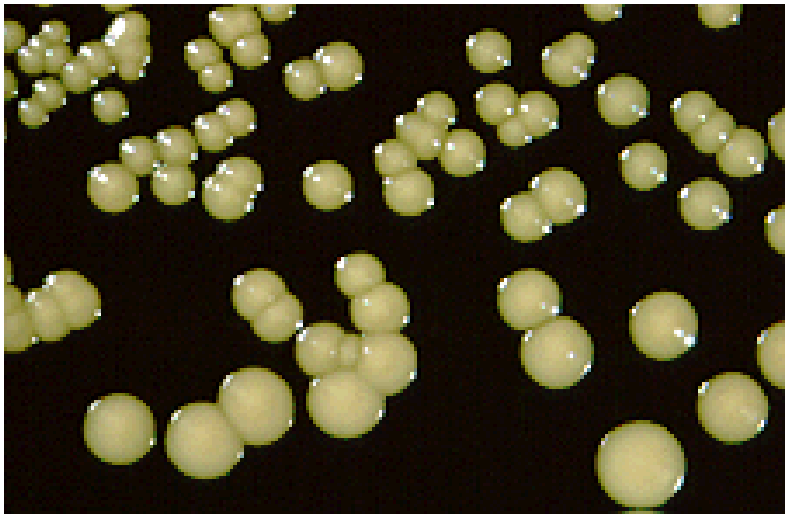
No specific factors for death were identified.

In summary, a high proportion of fluconazole-resistant or susceptible dose-dependent strains was cultured.

These results confirm the high mortality rates of Candida peritonitis and plead for additional investigation in this population. Antifungal treatment for severe cases of Candida peritonitis in ICU patients remains the standard care.

Direct microscopy of sterile body fluids, such as CSF, vitreous humor, joint fluid and peritoneal fluid is relatively insensitive and positive culture will usually be required to make a diagnosis.



Serology:

interpretation of serological tests for *Candida*, especially in the neutropenic patient
... is often difficult
....must be correlated with other diagnostic methods

False-negatives and false-positive results do occur.

Hopwood and Evans (1991) provide an excellent review of the current serological methods available.

Peritoneal Dialysis-Related Candida Peritonitis

This infection is relatively uncommon in comparison with bacterial peritonitis, but it is nonetheless a serious complication associated with significant morbidity and mortality

Risk factors include previous episodes of bacterial peritonitis, probably as markers of exposure to broad-spectrum antibacterial therapy, and presence of candidiasis at other sites.

Peritoneal Dialysis-Related Candida Peritonitis

Unlike other forms of deep-seated candidiasis, dissemination is distinctly uncommon. Some experts propose that when a patient being treated for bacterial peritonitis does not respond within 3–4 days to antibacterial therapy, a fungal cause should be suspected.

Levallois J, Nadeau-Fredette AC, Labbé AC, et al.
Ten-year experience with fungal peritonitis in peritoneal dialysis patients: antifungal susceptibility patterns in a North-American center.
Int J Infect Dis 2012; 16:e41–e43.

Peritoneal Dialysis-Related Candida Peritonitis

Numerous clinical reports emphasize the importance of catheter removal in achieving cure

Intraperitoneal instillation of amphotericin B is no longer recommended because it is associated with chemical peritonitis and development of peritoneal fibrosis.

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Ten-year experience with fungal peritonitis in peritoneal dialysis patients: antifungal susceptibility patterns in a North-American center.
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Candidiasis in immunocompetent patients.

The first step in the management of candidiasis should be to correct the underlying conditions that allow *Candida* to colonise the skin or mucosa ie to restore the normal epithelial barrier function.

Candidiasis in immunosuppressed patients.

it is often not possible to correct the underlying predisposing conditions that would prevent candidiasis in these patients

Candidiasis in immunosuppressed patients.

These patients present a major diagnostic problem for the clinician, primarily due to the inadequacies of current diagnostic methods.

Thus empiric treatment with Amphotericin B is usually initiated in patients with persistent antibacterial resistant fever for greater than 72-96 hours duration.

Candidiasis in immunosuppressed patients.

High dose Fluconazole [400-800 mg/day] and Liposomal Amphotericin B [3-5 mg/kg/day] have also been used with success, especially in cases of hepatosplenic candidiasis.

More recently, the combined use of Fluconazole with 5-Flucytosine and Fluconazole with Amphotericin B have been used to treat some patients with systemic candidiasis.

In addition, haematopoietic growth factors such as G-CSF, GM-CSF and M-CSF have been used to stimulate neutrophil and/or monocyte-macrophage production in order to boost the host immune system.

Antifungal Therapy

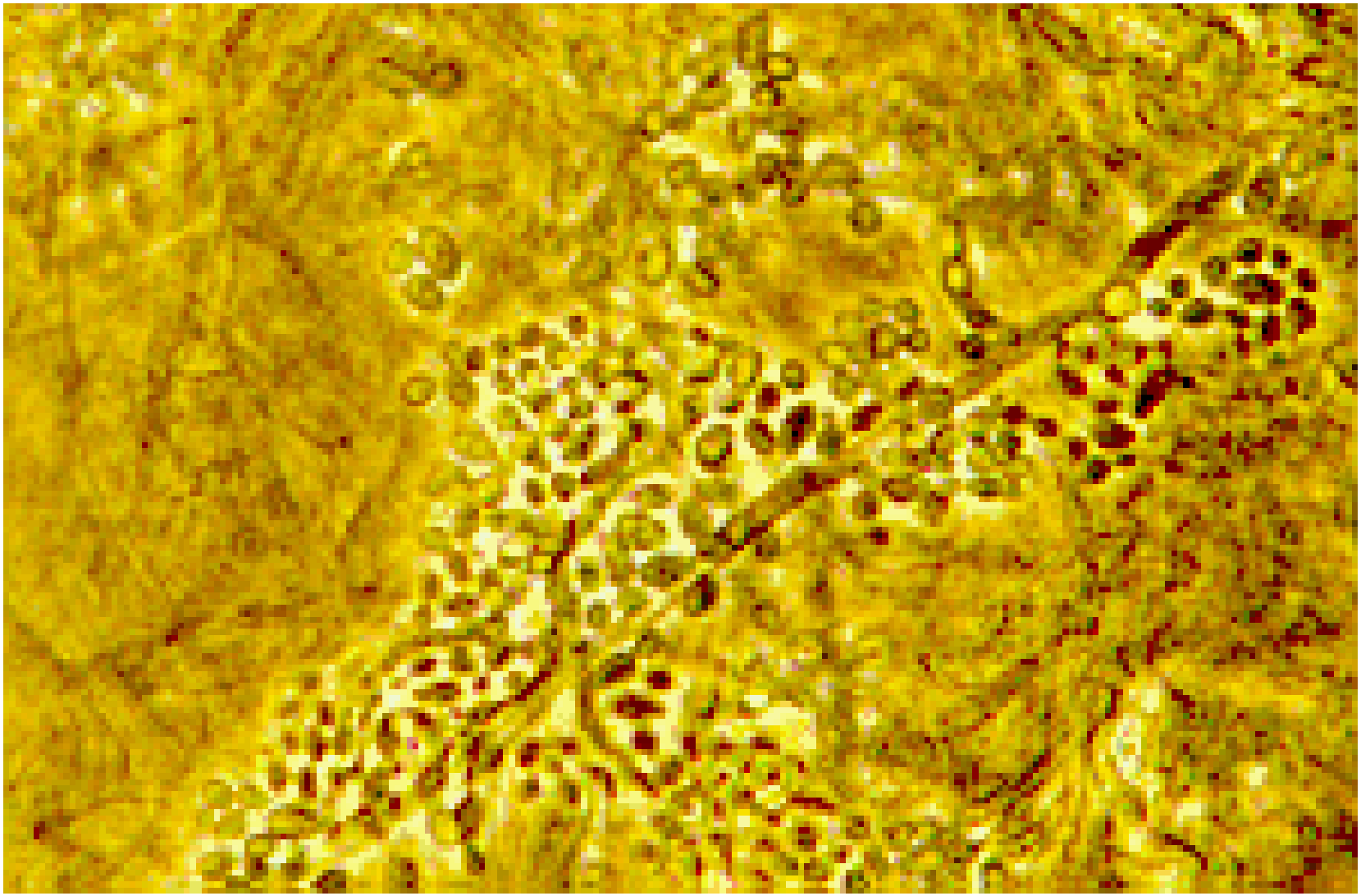
Antifungal therapy is recommended if *Candida is grown from intra-abdominal cultures (B-II).*

Fluconazole is an appropriate choice for *Candida albicans (B-II).*
For fluconazole-resistant *Candida species, therapy with* an echinocandin is appropriate (B-III)

For the critically ill patient, initial therapy with an echinocandin instead of a triazole is recommended (B-III).

Because of toxicity, amphotericin B is not recommended as initial therapy (B-II).

10% KOH mount showing the presence of budding yeast cells and pseudohyphae in a skin scraping.



Thank you

PAS stained smear showing the presence of budding yeast cells and pseudohyphae in a urine specimen.