A case of *Acremonium strictum* peritonitis

ASLI GAMZE SENER*, MINE YUCESOY‡, SECKIN SENTURKUN‡, ILHAN AFSAR*, SUREYYA GUL YURTSEVER* & MERAL TURK*

*Ataturk Training and Research Hospital Clinical Microbiology Department, ‡Dokuzeylul University Medical Faculty Microbiology and Clinical Microbiology Department, and ‡Ataturk Training and Research Hospital Nephrology Department, Izmir, Turkey

During the past two decades opportunistic fungal infections have emerged as important causes of morbidity and mortality in patients with severe underlying illnesses. A few cases of *Acremonium* spp. infections have been described in immunocompromised patients, but they have on occasion been reported as the cause of invasive disease in immunocompetent individuals. Peritonitis is a common clinical problem that occurs in patients with end-stage renal disease treated by continuous ambulatory peritoneal dialysis (CAPD). Yeasts, or rarely molds, may also cause peritonitis in patients on CAPD and we present here a case caused by *Acremonium strictum*.

**Keywords** *Acremonium strictum*, opportunistic fungal infection, peritonitis

**Introduction**

Hyaline filamentous fungi which were previously uncommon as disease agents are increasingly encountered as the cause of life threatening invasive infections that are often refractory to conventional therapies [1]. Infections with fungi such as *Acremonium* species have become significant problems in the treatment of immunocompromised hosts [2]. *Acremonium* species have been reported to be the cause of localized or disseminated infections in patients with predisposing conditions such as Addison’s disease, neutropenia, immune suppression and intravenous drug abuse [3–5]. We present a case of a fungal peritonitis caused by *Acremonium strictum* in a patient undergoing continuous ambulatory peritoneal dialysis (CAPD).

**Case report**

A 47-year-old woman with diabetes mellitus and chronic renal failure was admitted to the nephrology service of Ataturk Training and Research Hospital with dimness in peritoneal dialysis fluid. The patient’s primary diagnosis was hypertensive nephropathy of eight years duration and she had been treated by CAPD for five years. Abdominal pain was the main complaint of the patient. Physical examination revealed edema in the pretilial region. Tension arterial and pulses were normal. Biochemical findings were as follows: hematocrit 29%; leucocyte count 10000/ml; neutrophil count 7800/ml; eritrocet sedimentation rate 109 mm/h; glucose 155 mg/dl; urea 92 mg/dl; and transaminases ALT and AST of 8 and 6 U/l, respectively. Leucocyte count was detected as 1,200/ml in peritoneal dialysis fluid.

Cultures were inoculated with blood, nasal, peritoneal dialysis fluid and catheter samples. *Staphylococcus aureus* was recovered from the nasal specimens. In addition leucocytes (1,200/ml) were detected in peritoneal dialysis fluid. Nasal mupirocin and systemic antibacterial therapy (cefazolin and ciprofloxacine) were started. Fungal colonies were isolated in cultures inoculated with peritoneal dialysis fluid.

Isolation and identification of *Acremonium* spp. were performed in the laboratory of the Department of Microbiology, Ataturk Training and Research Hospital. Direct examination of the specimen of the peritoneal dialysis fluid revealed hyphae and leucocytes. The peritoneal fluid was cultured on sheep blood agar, eosin-methylene-blue agar and Sabouraud dextrose agar. After 4 days of incubation at 37°C, mold colonies were observed on all agar plates. Downy, pale-salmon
(orange/white) colored colonies were observed on Sabouraud dextrose agar (SDA). On microscopic examination with lactophenol cotton blue, septate hyphae, conidiogenous cells and needle-shaped awl phialides were seen. This fungus was identified as *Acremonium* spp. on the basis of its colony morphology and its morphology on microscopic observation of the lactophenol cotton blue preparations (Figs. 1–3) and further identified as *Acremonium strictum* by Centers for Disease Control and Prevention Fungus Reference Unit. Molecular analysis was not performed. Oral fluconazole (100 mg/day) and removal of the catheter resulted in microbiologic and clinical cure.

**Discussion**

In the last few years there has been an increase in mycoses caused by opportunistic fungal pathogens [6].

Species of the genus *Acremonium* are widespread soil saprophytes which on rare occasions can be opportunistic pathogens in immunosuppressed individuals [7–12]. Wang et al. [8] reported *Ochroconis gallopavum* infection and *Acremonium* spp. peritonitis in a 13-year-old renal transplant recipient. The patient failed to respond to high dose amphotericin B therapy and died. Chang et al. [9] reported a patient with leukemia who developed pyomyositis due to *Acremonium* spp. They successfully treated the patient with amphotericin B, granulocyte colony-stimulating factor (G-CSF) and surgical drainage. Disseminated *Acremonium strictum* infection in a neutropenic patient was reported by Schell and Perfect [10]. There are only a few reports for disseminated *Acremonium* infections. Foell et al. [11] presented a case of double fungal infection with disseminated *Acremonium strictum* and pulmonary *Aspergillus fumigatus*. They reported that the infections were rapidly fatal despite neutrophil recovery and early antifungal combination therapy with amphotericin B and caspofungin. In another study, fungal infections of dialysis fistulae were presented in two patients with recurrent infections were presented. *Staphylococcus aureus* and *Acremonium* species were isolated from the thromboses of their grafts [12]. The authors suggested amphotericin B therapy for fungal infections of dialysis fistulae. However Mattei et al. [13] reported two cases of *Acremonium* fungemia which were successfully treated with voriconazole with very mild toxicity. Peritonitis is a frequent complication in patients with chronic renal failure on continuous ambulatory peritoneal dialysis (CAPD) treatment. Manzano-Gayosso et al. [14] investigated the prevalence of fungal peritonitis on patients undergoing CAPD. Specimens of the peritoneal dialysis fluid from 165 patients on CAPD treatment with peritonitis manifestations were submitted for
mycological studies and Acremonium spp. were isolated in two of the cases.

Because reported cases are limited, optimal treatment of Acremonium species infections is not well-defined. In addition, conflicting results have been obtained in different studies [3–5,15]. Early catheter removal and prophylaxis have been suggested for peritoneal dialysis patients with fungal peritonitis [16]. Chan et al. [17] have studied 290 patients on CAPD and recommended that oral fluconazole was used as initial therapy in all patients, which was followed by catheter removal if peritonitis failed to improve. The cure rate with fluconazole therapy alone without catheter removal was 9.5% but when combined with catheter removal, the cure rate increased to 66.7%. They concluded that oral fluconazole can be safely used as initial therapy in patients with fungal peritonitis complicating CAPD. Warris et al. [18] reported a 7-year-old boy with relapsed acute lymphatic leukemia who developed fungaemia caused by Acremonium strictum and amphotericin B and fluconazole were used to treat the patient. General resistance to most antifungals, excluding amphotericin B and ketoconazole has been reported [5]. Hence, amphotericin B therapy, in combination with ketoconazole or another azole or allylamine, is advocated for Acremonium infections [3–5,16,19].

Although Acremonium infection is rare in humans, cases have been increased recently. This is due to recent advances in medical technology that have led to increased numbers of immunosuppressed patients, receiving broad-spectrum antibiotics or having indwelling medical devices [20].

We emphasize the importance of an active search for unusual organisms like Acremonium strictum in immunodeficient patients and early specific treatment against such microorganisms for the reduction of their morbidity and mortality.

References

This paper was first published online on iFirst on 5 March 2008.