An Unusual Case of CAPD-Related Peritonitis Associated with *Candida Albicans*

Peritonitis is the main infectious complication in patients undergoing continuous ambulatory peritoneal dialysis (CAPD). The most common organisms causing bacterial peritonitis are gram-positive, although the number of gram-negative infections is increasing (1). In about 5% of the episodes, fungal infections account for fungal peritonitis (FP). In most cases, FP episodes are caused by *Candida* species, and *Candida albicans* represents approximately 25% of cases (2). Prolonged use of broad-spectrum antibiotics (especially ciprofloxacin and ceftriaxone), leading to colonization of the colon and other sites with yeast, and previous bacterial peritonitis are regarded as the strongest risk factors for FP in CAPD patients (3). Continuous ambulatory PD peritonitis may occur by several routes. The most common is thought to be intraluminal and is the major route for skin and environmental organisms. Furthermore, obesity and diabetes mellitus are leading predisposing factors for cutaneous candidiasis. Here, we report on a patient with *Candida albicans*-related peritonitis presumably caused by an intertrigo of the right inguinal region, an inflammation of the body folds usually associated with *Candida albicans* (4).

A 70-year-old, obese woman (87.0 kg, 1.66 m, body mass index [BMI] 31.3) with end-stage renal disease as a consequence of diabetes mellitus (mean HbA_{1c} 7.2%) was undergoing continuous cycle peritoneal dialysis (CCPD) (high average transporter type) for 22 months without any complications. At this time, correct peritoneal dialysis (PD) procedure was being carried out by her husband. Due to the husband's rehabilitation, the woman went to a special-care home as an ambulant patient. Although experienced staff was available for conducting appropriate PD procedures, the patient carried out PD exchanges unattended several times. One week later the effluents became cloudy. On physical examination, we saw a non-acutely ill-looking woman with a slightly diffuse tender abdomen. There were no signs of an exit-site infection. Furthermore, an ultrasound investigation of the

tunnel resulted in no pathological findings. The PD fluid had an elevated white cell count (WCC) of $4.9 \times 10^9/L$. The gram stain of the peritoneal fluid was negative and indicated the absence of gram-positive and gram-negative bacteria as well as yeasts. For culture analysis, an aliquot of dialysate fluid was inoculated into a blood culture system (Bactec; BD diagnostics, NJ, USA). The peripheral WCC was $7.1 \times 10^9/L$ and serum C-reactive protein (CRP) was 94 mg/dL (normal < 6 mg/dL). After intraperitoneal (IP) administration of a broad-spectrum antibiotic regimen using piperacillin/tazobactam (2×4.5 g/d) according to local policy to cover possible *Pseudomonas* peritonitis or enteric organisms, CRP declined within 3 days. During this time PD was continued. The PD fluid, however, remained cloudy with a slightly decreased WCC of $0.5 \times 10^9/L$. In the cultured PD fluid, a *Candida albicans* strain sensitive to fluconazole was identified. A subsequent physical examination of the patient revealed an intertrigo infection located in the right fossa inguinalis. In accordance with the analysis of the PD fluid, *Candida albicans* was also found in the smear of the intertrigo infection. The antimicrobial regimen was changed to IP administration of fluconazole (200 mg/d). Later on, the WCC remained at an elevated level of $2.1 \times 10^9/L$ and the effluents became hemorrhagic. Consequently, the catheter was removed and the patient was placed on hemodialysis.

In this case, inappropriate personal hygiene and intraluminal mediated infection with *Candida albicans* is considered as the main reason for the FP. In conclusion, this case demonstrates the necessity of proper cleaning and drying of skin folds in particular of diabetic and obese patients as well as sufficient hand hygiene for risk reduction of infections caused by touch contamination (5).

DISCLOSURES

The authors have no financial conflicts of interest to declare.

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