Peritonitis remains a leading complication of peritoneal dialysis (PD). About 18% of the infection-related mortality in PD patients is a result of peritonitis. We present a case of peritonitis in a patient on automated PD in whom the infection was not related to a break in PD technique, but to an unusual cause: retrograde transmission of a gonococcal organism.

Key words
Peritonitis, gonococcal infection

Introduction
Peritonitis remains the major complication of peritoneal dialysis (PD), contributing to significant morbidity. About 18% of infection-related mortality in PD patients is related to peritonitis (1). Peritonitis has a significant influence on peritoneal membrane characteristics, leading to PD failure. The spectrum of usual organisms is small, but sometimes rare organisms gain access to the peritoneal cavity. We present a case of peritonitis in a patient on automated PD (APD) in whom the infection was not related to a break in PD technique, but to an unusual cause.

Case description
A 20-year-old woman presented with abdominal pain of 1 week’s duration. The patient had been noncompliant with her PD for 10 days, and when she resumed therapy, she noticed cloudy PD effluent. She had generalized weakness, poor appetite, and abdominal pain, but no diarrhea or oozing from the PD catheter exit site.

Past medical history consisted of end-stage renal disease secondary to Alport disease, with PD start in June 2012. Her APD prescription consisted of 1.5% glucose solution (fill volume: 2000 mL) in 6 cycles over 9 hours. She did not use long day dwells. She still had a good amount of urine output (approximately 700 mL daily). She had experienced 1 episode of PD peritonitis in June 2013, but the organism was not detected, and the infection responded to intraperitoneal vancomycin and ceftazidime.

Other significant history included deafness, anemia of end-stage renal disease, and secondary hyperparathyroidism. She had no visual defects. Her home medications included calcitriol, ferrous sulphate, alfa erythropoietin, phosphate binders, and oral furosemide for volume control. Health information for her biologic parents was not available. The patient was married and sexually active with her husband. No history of substance abuse was present. She reported intermittent menstrual spotting, the last episode having occurred 3 months earlier.

Physical examination was unremarkable except for diffuse abdominal tenderness. The PD catheter exit site was clean. The effluent analysis showed a cell count of 81,000, with 89% neutrophils. Gram stain showed gram-negative diplococci. Considering the microbiology report, gonococcal peritonitis was diagnosed. The original loading dose of vancomycin and ceftazidime was then tailored to monotherapy with ceftazidime.

On further questioning, the patient reported having had unprotected sex 2 weeks before her peritonitis. She denied any pelvic complaints, including vaginal discharge, pelvic pain, or bleeding per vagina.

Discussion
The most common source of peritonitis in PD patients is contamination at the time of PD fluid exchange. Such infections are commonly caused by staphylococci from skin. Other common routes of bacterial entry include extension of infection from the exit site, an enteric source, or hematogenous seeding. Gonococcal infection covers a broad disease spectrum that
includes asymptomatic infection, cervicitis, urethritis, anorectal infection, pelvic inflammatory disease, and disseminated gonococccemia. A disseminated infection can seed into the peritoneum, but the affected patients typically exhibit systemic symptoms, including fever, chills, dermatitis, tenosynovitis, and polyarthralgia. Our patient did not show any such symptoms.

Another route of infection in PD peritonitis is ascending infection from the pelvic organs. This possibility is restricted to women because of the unique nature of the pelvic peritoneum. The ovarian end of the fallopian tubes opens into the abdominal peritoneal cavity, potentially providing a route for the entry of organisms that can cause peritonitis. Retrograde menstruation is a well-known phenomenon and has been reported in menstruating PD patients. Blumenkrantz et al. (2) noticed cyclical hemoperitoneum among menstruating continuous ambulatory PD patients, suggesting that retrograde menstruation occurs despite the patient being on PD. Several case reports have described leakage of peritoneal fluid into the vagina, providing more evidence of open communication between the peritoneal cavity and the vagina (3–5). An ascending infection can result in peritonitis caused by vaginal flora, including yeasts (6–9). The risk seems to be especially higher after vaginal instrumentation or the use of intrauterine contraceptive devices (10). In our patient, an ascending infection from the vagina was a potential source of her peritonitis.

Summary
Patients should be educated about safe sexual practices. Preventive care should include information on contraceptive methods, with an emphasis on preventing sexually transmitted diseases. Barrier methods are preferable. Intrauterine contraceptives should be avoided because of the risk of pelvic inflammatory disease (10). The role of hormonal contraception in preventing pelvic inflammatory disease is controversial. Tubal ligation can potentially prevent ascending infections, but a theoretical risk remains because of the potential for spontaneous recanalization of the fallopian tubes. Sexually active women should undergo routine cervical cancer screening. Patients should seek prompt medical advice for any symptoms of pelvic inflammatory disease. Sexual partners should also be screened to prevent recurrence of infections.

Our patient was successfully treated with 2 weeks of intraperitoneal ceftazidime. She was also given a course of oral doxycycline to cover for possible coexisting chlamydial infection in accordance with the 2010 guidelines from the U.S. Centers for Disease Control and Prevention on the management of gonococcal infections (11) and was advised to consult with an obstetrician/gynecologist for a pelvic exam. The patient refused HIV testing and did not pursue a pelvic exam.

Our case highlights the need for nephrologists to be alert to the possibility of sexually transmitted diseases in their PD patients and particularly to the possibility that organisms of the female genital tract can cause peritonitis, which can potentially be recurrent.

Disclosures
The authors have no financial conflicts of interest to disclose.

References
PD Peritonitis with an Uncommon Organism


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