

Cyclic Pseudoperitonitis Secondary to Endometriosis in a Peritoneal Dialysis Patient

Editor:

A 28-year-old woman with a history of progressive chronic kidney disease was started on continuous ambulatory peritoneal dialysis in October 2010. Within 1 month, the patient presented with a first episode of cloudy effluent, but with no other signs of peritonitis, such as abdominal pain or fever. The International Society of Peritoneal Dialysis protocol was followed. Broad-spectrum antibiotics (cefazolin plus ceftazidime) were initiated intraperitoneally.

A complete blood count showed elevation in white blood cells of $17.2 \times 10^9/L$ with $0.82 \times 10^9/L$ neutrophils. Peritoneal effluent was cloudy and colorless. The fluid analysis revealed a total nucleated cell count of $0.8 \times 10^9/L$, with 94% polymorphs, 3% lymphocytes, 3% mononuclear cells, and 0% undifferentiated cells. No red blood cells were detected. Gram stain, culture, and sensitivity were negative.

The patient finished a full course of antibiotics, and the cloudy effluent eventually cleared uneventfully. Shortly afterward, in early 2011, the patient experienced a similar episode of cloudy dialysate fluid. Once again, the peritonitis protocol was initiated. Peritoneal effluent again showed increase in total nucleated cells ($0.7 \times 10^9/L$), 67% polymorphs, 22% monocytes, 10% lymphocytes, 1% eosinophils, 0% undifferentiated cells, and no red blood cells. On this occasion, a positive culture for *Corynebacterium* species was obtained. The clinical significance of the culture was questioned, but antibiotics were continued and tailored to the culture results. Vancomycin was initially used. However, because of an allergic reaction, a switch was made to oral clindamycin for 10 days, and the episode of presumed peritonitis resolved.

The patient subsequently continued to develop recurrent episodes of cloudy dialysate bags on a monthly basis, with an identical clinical picture of cloudy colorless effluent, elevated total nucleated cells, polymorphs, absence of red blood cells, and negative cultures. Routine protocols were followed, and treatment was undertaken on the assumption that an underlying infection was the cause. At one point, the possibility of a switch to hemodialysis was discussed with the patient. For family reasons, the patient was quite reluctant to entertain the switch.

The patient then began to notice a pattern in her presentation. She noted that the cloudy bags always

coincided with her menstrual periods. Interestingly, her effluent never appeared to be grossly bloody. A review of the literature confirmed past case reports of hemoperitoneum in the setting of endometriosis. That discovery prompted referral for a gynecologic assessment.

In June 2011, the patient reported a 6th episode of cloudy dialysate bags. Given the consistent association of cloudy bags with the patient's menstrual period, the patient and the treating physician both elected to continue watchful waiting. The patient reported that her cloudy bags had cleared completely on the 5th day of her menstrual period without the use of any antibiotics. Every subsequent follow-up visit, which occurred monthly, the patient continued to report the recurrence of cloudy bags, which cleared by the end of her menstrual cycle.

Upon gynecologic consultation and subsequent clinical diagnosis of endometriosis (based on family history and pattern of pain), the patient was started on oral contraceptive pills (ethinyl estradiol and norethindrone). Within 1–2 cycles, the patient no longer reported cloudy effluent during her menstrual cycle, and no further episodes of pseudoperitonitis occurred.

DISCUSSION

Cloudy peritoneal effluent is most commonly a result of bacterial peritonitis (1–3) and one of the earliest peritonitis signs to appear (4). According to the 2010 update of International Society for Peritoneal Dialysis guidelines, patients presenting with cloudy effluent should initially be diagnosed with peritonitis, with effluent analysis and a culture to follow, and empiric antibiotics should be started (2,5–7). In patients presenting only with cloudy effluent in the absence of other symptoms and signs of peritonitis, it is reasonable to delay the initiation of antibiotics, provided that the effluent is analyzed in a timely manner (8). In the case of culture-negative effluent, other causes of cloudy dialysate should be suspected after atypical infections have been excluded (1).

Although culture-negative peritonitis is not uncommon (9), our patient experienced recurrent cloudy effluent, with negative cultures, coinciding with her menstrual period. Fortunately, the association with her menstrual cycle was recognized. A subsequent clinical diagnosis of endometriosis was made, and appropriate therapy led to resolution of the recurrent pseudoperitonitis.

The novel feature in this case was that the patient did not present with hemoperitoneum, as previously reported in the literature (10–15). The patient presented in a manner which truly mimicked the usual presentation

of bacterial peritonitis, but without other clinical signs of peritonitis beyond the cloudy effluent. Eventually, because of the strong association of those presentations with her menstrual period, conservative management without antibiotics led to complete resolution of the cloudy dialysate bags upon menstrual period cessation. The subsequent use of anti-ovulatory medications as a form of treatment for endometriosis led to complete resolution of the pseudoperitonitis.

A review study by Rocklin *et al.* (10) listed many causes of cloudy effluent. Retrograde menstruation and other gynecologic causes such as ovulation were discussed as a cause of cloudy effluent because of the presence of an increased number of red blood cells. Tse and colleagues (11) reviewed 549 patients on continuous ambulatory peritoneal dialysis for recurrent hemoperitoneum. Most of the cases in women were attributable to retrograde menstruation (11). In a single-center experience and literature review, Greenberg *et al.* (12) reported that hemoperitoneum in peritoneal dialysis patients was more common in women and that the most common cause was related to menstruation and ovulation. In addition, Blumenkrantz *et al.* (13) observed hemoperitoneum in 9 of 11 female chronic peritoneal dialysis patients. Those episodes happened exclusively during the time of menstruation.

In our case, the absence of other clinical signs of peritonitis, the negative cultures for almost all of the cloudy bags, and the fact that all the episodes coincided with the patient's menstrual period made the diagnosis of bacterial peritonitis unlikely.

Many of the cases and studies that we reviewed identified gynecologic issues such as retrograde menstruation as a cause of visible hemoperitoneum (14,15), and red blood cells were reported in the bloody effluent bags for those patients. In our case, the bags were always cloudy rather than bloody. We are hence reporting a clinical case of endometriosis as an additional cause of recurrent cloudy peritoneal effluent.

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