Successful use of cytology brush in the treatment of relapsing CAPD peritonitis


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Key words: relapsing peritonitis; biofilm; cytology brush

Case Report

A 41-year-old female on CAPD presented with diffuse abdominal pain and cloudy peritoneal dialysate in May 1996. She was first diagnosed with end-stage renal disease and was started on CAPD in 1995. The patient had a history of recurrent peritonitis, with the last three episodes occurring at 1-month intervals. The patient was treated with appropriate intraperitoneal antibiotic therapy and brushing the intraluminal surface of the Tenckhoff catheter (Figure 1) with a disposable cytology brush (BC-15C, Olympus, Japan) (Figure 2) used in the pulmonary department. After brushing the intraluminal surface of the Tenckhoff catheter and antibiotic treatment, the patient did not experience another episode of peritonitis for almost 10 months.

Fig. 1. Plain abdominal film show the bristles of the cytology brush of side effects were noted including fever, abdominal pain or tenderness, and the onset of turbid dialysis bags [3]. Here, we describe a case of 41-year-old woman with recurrent CAPD peritonitis in which the last three episodes occurred at 1 month intervals. We performed brushing the intraluminal surface of the Tenckhoff catheter (Figure 1) with a disposable cytology brush (BC-15C, Olympus, Japan) (Figure 2) used in the pulmonary department. After brushing the intraluminal surface of the Tenckhoff catheter and antibiotic treatment, the patient did not experience another episode of peritonitis for almost 10 months.

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has not developed peritonitis from May 1996 to the intraluminal biofilm of the Tenckhoff/DC2 catheter and surface of the catheter (Figure 1). Four days after the first streptokinase instillation [3].

brush extended to the distal tip of the catheter and days duration. The most serious side effects were noted [3]. Streptokinase probably Acinetobacter revealing no growth. Empirical treatment was com- relapsing peritonitis [3]. Clearly, this therapy would

revealed a cell count of 725 leukocyte/mm$^3$. Urinalysis showed protein (2 +) and stool occult blood was negative. No microorganism was seen in the concentra-
tion smear of the dialysate and the culture of dialysate revealed no growth. Empirical treatment was com-
menced with i.p. ciprofloxacin and tobramycin, accord-
ing to the sensitivity of the last cultured Acinetobacter baumanii. However, we thought that the recurrent peritonitis might be related to the intraluminal biofilm within the Tenckhoff catheter. So we inserted the disposable cytology brush (BC-15C, Olympus, Japan) (Figure 2) into the Tenckhoff catheter till the tip of brush extended to the distal tip of the catheter and then performed repeated brushing of the intraluminal surface of the catheter (Figure 1). Four days after the commencement of the empirical antibiotic therapy and cytology brushing, the peritonitis was improved and the turbid dialysate also cleared. Since then, the patient has not developed peritonitis from May 1996 to February 1997.

Discussion

Relapsing peritonitis is defined arbitrarily as another episode of peritonitis caused by the same genus/species of organism which caused the immediately preceding episode and occurs within 4 weeks of completion of the antibiotic course [4]. Such relapses often lead to removal and replacement of CAPD catheters and/or alternative renal replacement therapy. Differentiation of relapse from reinfection can only be possible by careful microbiological studies. Relapse may legitimately be considered a failure of the antibiotic treatment in clearing all the infecting organisms [2]. The source of infection is never completely eradicated by the antibiotic therapy thus leading to another episode of peritonitis. In the majority of these cases, no obvious source of infection is found, and often the infection is eradicated only upon removal of the Tenckhoff catheter. The probable cause of relapsing peritonitis is colonization of responsible organisms within the biofilm of the Tenckhoff catheter. The organisms of relapsing peritonitis are liable to adhere, and grow on polymer surfaces, producing an extracellular slimy substance resulting in thick matrix with embedded microbial layers [5–7]. The biofilm is thought to inhibit the chemotactic response of neutrophils, proliferative response of lymphocytes, production of interferon-$\gamma$, and opsonization of bacteria [8,9]. Two enzymes, streptokinase and urokinase, have been utilized in the treatment of relapsing peritonitis. Both are considered to cause the conversion of plasminogen to plasmin, which in turn acts upon fibrin resulting in fibrinolysis. The rationale behind the utilization of such enzymatic agents in relapsing peritonitis is that organisms are trapped in fibrin along the peritoneal or intraluminal surface of the catheter. These organisms are then protected from the antibiotic actions and other defence mechanisms [10]. By exposing these organisms to the action of antibiotics, one may improve the cure rate. Previous papers on thrombolytic agent usage have reported not only resolution of relapsing peritonitis [11,12] or catheter malfunction [13–15] with minimal or no adverse reactions but also a 50% cure rate in relapsing peritonitis [3]. Clearly, this therapy would not be of benefit in peritonitis due to resistant bacteria, catheter tunnel infection, or external reinfection secondary to poor sterile technique. However, a high rate of side effects were noted [3]. Streptokinase probably releases a fibrin clot containing bacteria, leukocytes, and debris from the colonized catheter into the peritoneal cavity causing a ‘peritonitis-like syndrome’ of 1–3 days duration. The most serious side effect was the occurrence of fungal peritonitis occurring 5 days after the first streptokinase instillation [3].

In this case, the unique method of removing the intraluminal biofilm using a cytology brush was met with success. The cytology brush probably removes the intraluminal biofilm of the Tenckhoff catheter and thus reduces the sources of relapsing infection. Although we cannot confirm removal of the biofilm in the Tenckhoff catheter, the clinical response of this patient suggests that brushing intraluminal portion of a Tenckhoff catheter with a cytology brush is useful as an adjunct mode of therapy in the treatment of relapsing peritonitis.

References


Received for publication: 4.4.97
Accepted: 9.4.97