



Case Report

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Laparoscopic peritoneal biopsy for the diagnosis of tuberculous peritonitis in a peritoneal dialysis patient

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Abstract

Peritoneal tuberculosis is a rare but a severe disease in patients undergoing continuous ambulatory peritoneal dialysis (CAPD). A 60 years old male, who had been the CAPD program during the last 5 months, was admitted to our clinic with fever, loss of appetite, night sweats, cough, weight loss and cloudy dialysate. Mycobacteria cultures of blood and pleural fluid were sterile. Bacterial cultures of peritoneal fluid were also sterile. The patient was initially treated for presumed bacterial peritonitis but remained febrile and also the dialysate remained cloudy. Laparoscopic peritoneal biopsy was performed. The peritoneal biopsy revealed giant cell granulomas formed by lymphocytes, histiocytes and Langerhans cells. Triple anti-tuberculous treatment was started. In this case tuberculosis peritonitis was successfully treated without interruption of dialysis and removal of the peritoneal dialysis catheter. We concluded that laparoscopic biopsy can be applied to the patients with persistent culture negative peritonitis.

Keywords: Continuous ambulatory peritoneal dialysis, Peritoneal tuberculosis, Laparoscopic peritoneal biopsy.

INTRODUCTION

Almost one-third of the world's population is infected with mycobacterium tuberculosis^[1]. There is a high incidence of extra-pulmonary tuberculosis (TB) in uremic patients receiving dialysis therapy^[2]. However, the incidence of tuberculous peritonitis is rare in patients undergoing continuous ambulatory peritoneal dialysis (CAPD). TB peritonitis constitutes 1-2% of all peritonitis cases in CAPD patients^[3]. Early diagnosis is important and the mortality rate is about 25%^[4]. Since there are no specific signs and symptoms, it is difficult to diagnose TB peritonitis. The definitive diagnosis relies on isolating Mycobacterium tuberculosis from the peritoneal dialysis effluent, which takes 4-6 weeks.

Mycobacterium tuberculosis DNA polymerase chain reaction (PCR) in peritoneal biopsies obtained by laparoscopy or laparotomy provides rapid diagnosis in patients on CAPD^[5]. These procedures may require temporary withdrawal of CAPD. In non-uremic patients, the measurement of adenosine deaminase (ADA) and interferon-gamma in ascitic fluid is useful for the diagnosis of TB peritonitis^[6]. However, the optimal non-invasive diagnostic tool in CAPD patients who are suspected for TB peritonitis remains to be elucidated. Here, we present a CAPD patient with TB peritonitis, which was easily diagnosed by laparoscopic biopsy and treated successfully without catheter removal.

CASE REPORT

A 60-year-old male, who was on the CAPD program during the last five-months, was admitted to our clinic with fever, loss of appetite, night sweats, cough, weight loss, and cloudy dialysate. He had a previous history of pulmonary TB. On his physical examination, he was pale. Body temperature was about 39°C. Crackles were noted over both lower lung fields. All over his abdomen was tender to touch and he was not able to pinpoint the main area of pain. There was no evidence of exudate, erythema or infection around the catheter exit-site. Peritoneal fluid was cloudy.

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White blood cell count in peritoneal fluid was about 1820/ μ L with a differential showing polymorphonuclear cells, 70%; lymphocytes, 28%; eosinophils, 2%. Blood tests briefly were as follows: leukocytes, 6270/ μ L; hematocrit, 27.3%; platelets, 250000/ μ L; C-reactive protein, 57 mg/dL (normal range: <0.5 mg/dL); urea, 71 mg/dL (reference range: 5-20 mg/dL); creatinine, 6.1 mg/dL (reference range: 0.6-1.1 mg/dL); sodium, 131 mEq/L (reference range: 137-142 mEq/L); potassium, 3.8 mEq/L (reference range: 3.5-5.1 mEq/L); chloride, 98 mEq/L (reference range: 96-106 mEq/L); albumin, 2 g/dL (reference range: 3.5-5.5 g/dL); calcium 7.3 mg/dL (reference range: 8.5-10.2 mg/dL), phosphorus: 3.9 mg/dL (reference range: 2.4-4.5 mg/dL). Computed tomography mediastinal window showed a pleural effusion (figure 1).

He was diagnosed with peritonitis and pneumonia. Pleural fluid was exudative. Acid-fast bacilli (AFB) smear of pleural fluid and sputum was negative. ADA in pleural fluid was 144 U/L (reference range: 30-70

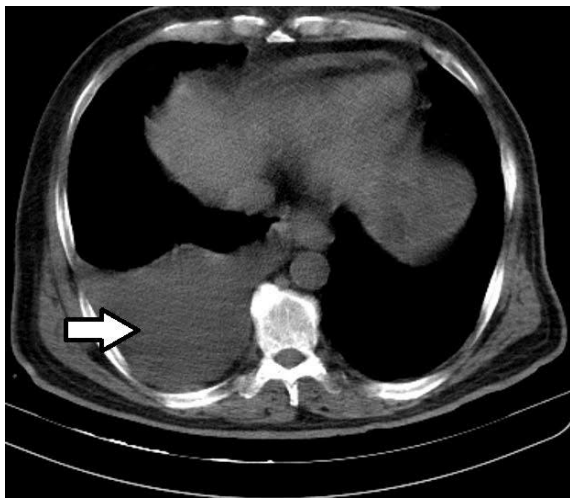


Figure 1: Computed tomography mediastinal window shows pleural effusion

DISCUSSION

In dialysis patients, the risk of TB increases due to defects in cellular immunity [7]. Malnutrition may increase this risk further [8]. TB peritonitis is a rare complication of PD [9]. However it can be seen during the CAPD treatment [10]. TB peritonitis emerges with the reactivation of a latent focus. [11]. The impairment of the immune functions in peritoneal cavity, including reduction of phagocytic activation of macrophages, decreased production of cytokines and a significant reduction of the total number of peritoneal lymphocytes, may precipitate TB peritonitis [12]. Decreased macrophage/organism interaction due to high lactate and hydrogen contents in the dialysate and high-volume concentrations of dialysate impairs peritoneal cellular immunity [13].

In previous studies, most of the extrapulmonary TB cases were observed common within the first 12 months of both hemo- and peritoneal dialysis [14]. TB development at the early periods of dialysis is explained by the improvement in the lymphocyte response in post-dialysis period. In our patient, TB developed in the sixth month of CAPD treatment.

The clinical picture of peritoneal TB in CAPD patients mimics bacterial or fungal peritonitis. Abdominal pain is the universal symptom. A cloudy dialysate is seen in 88% of the patients. Fever is common. High lymphocyte count in dialysate fluid is seen in only 30% of the TB peritonitis cases [15]. AFB is not sensitive and rarely positive. The detection of microorganisms in 1500-2000 mL dialysate is difficult [16].

U/L). Mycobacteria cultures of blood and pleural fluid were negative. Empiric intravenous levofloxacin was commenced for the pneumonia. Bacterial cultures of peritoneal fluid were negative. Intraperitoneal vancomycin and ceftazidime were given for the peritonitis. Signs and symptoms of pneumonia improved with antibiotherapy. However, dialysate remained cloudy. Peritoneal fluid was sent for AFB smear and culture. Test results were negative. Since he had still a persistent fever and cloudy dialysate, laparoscopic peritoneal biopsy was performed. The peritoneal biopsy revealed giant cell granulomas formed by lymphocytes, histiocytes and Langerhans cells (figure 2).

Triple anti-tuberculous treatment (isoniazid 300 mg/day and rifampicin 600 mg/day, pyrazinamide 1200 mg every 48 hours) was started. All symptoms including fever improved, dialysate became clear under the treatment. The anti-tuberculous therapy was ceased at the end of 12 months of treatment with no remarkable adverse event. He is still under CAPD program.

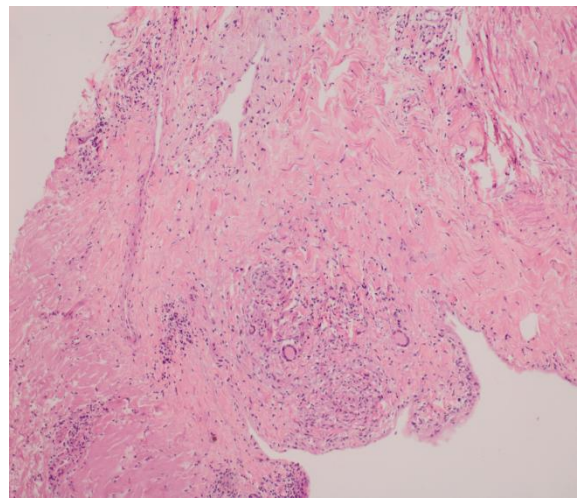


Figure 2: The peritoneal biopsy revealed giant cell granulomas formed by lymphocytes, histiocytes and Langerhans cells

In our case, the patient was diagnosed with peritoneal TB by peritoneal laparoscopic examination and biopsy. The sensitivity of ARB in dialysate fluid was highly variable between 3.8% and 80% [17]. Polymerase chain reaction (PCR) for Mycobacterium tuberculosis is a valuable test. Mycobacteria can be identified within 48 hours with the direct amplification of DNA sequence of tuberculosis. PCR test can be performed on sputum sample, body fluids and in tissues suspected to have TB extrapulmonary TB [18].

Mycobacterium culture is the gold standard in TB diagnosis, however, due to its long incubation period, some authors suggest laparoscopy and peritoneal biopsies, which are more invasive but more effective diagnostic methods [19]. Talwani *et al.*, reported that one of 11 cases died who were diagnosed with laparotomy. Peritoneal biopsy prevents the delay of diagnosis and reduces mortality [4]. In our case, the persistent complaints in the fifteenth day pushed us to perform laparoscopic peritoneal biopsy. In the treatment of TB peritonitis, which was a complication of CAPD, primarily removal of Tenckhoff catheter was suggested [20]. However, in many other studies, the removal of Tenckhoff catheter was not reported to be necessary during the treatment for TB. It was recommended that peritoneal dialysis should be continued during anti-TB treatment as long as ultrafiltration and clearance cause any problem [4]. In our patient, the peritoneal dialysis was not interrupted and Tenckhoff catheter was not removed since no problem was observed regarding peritoneal function and ultrafiltration. The antituberculous treatment was administered for 12 months. No significant side effects were observed.

CONCLUSION

In conclusion, in patients with peritonitis with unexplained lymphocytic and/or neutrophil predominance and fever, for early diagnosis, we recommend immediate laparoscopic examination of peritoneal cavity and pathological evaluation for tuberculosis.

Conflicts of Interest

The authors declare no conflict of interest.

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