

# Candida peritonitis on peritoneal dialysis: case report

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## ABSTRACT

**Background:** Chronic renal failure patients who utilize peritoneal dialysis often develop peritonitis. Peritonitis can have several causes, including Candida Parapsilosis. The mortality rate and peritoneal dialysis failure rate will rise with inadequate care.

**Case illustration:** A 46-year-old man has been experienced nausea and abdominal pain for a week. Peritoneal dialysis fluid becomes cloudy. The patient was receiving peritoneal dialysis for four years due to end-stage renal failure. Leg edema was seen, but the abdominal physical examination was normal. The results of the laboratory analysis for potassium, leukocytes, hemoglobin, and albumin were 2.8 g/dL, 4.5 mmol/L, 18800 103/mm, and 8 g/dL, respectively. The existence of Candida parapsilosis was discovered by peritoneal dialysis fluid culture. Peritonitis caused by Candida is the diagnosis in this instance. The patient received intraperitoneal injections of ceftriaxone 1 gram every 24 hours, fluconazole 200 mg, and Dianel 1.5% 2000 cc every six hours. After three days, the peritoneal dialysis fluid cleared up and the complaints of abdominal pain subsided, allowing Tenchoff PD to be maintained. Therapy sessions could last up to 14 days.

**Discussion:** The most frequent complaint of fungal peritonitis is abdominal pain. Peritoneal dialysis fluid culture is the usual diagnostic method. Leucocytosis in this case required antibiotics along with the antifungal medication Fluconazole 200 mg every 24 hours for 14 days.

**Conclusion:** Antifungals can prevent tenchoff failure and are helpful in cases of Candida-related peritonitis.

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## INTRODUCTION

Peritonitis is one of the most frequent complications of peritoneal dialysis (PD), 1% - 15% due to fungal infections. Fungal peritonitis has a mortality rate ranging from 5% to 53%, failure to continue peritoneal dialysis reaches 40% (Prasad Narayan, 2005). According to different study, there were 2361 episodes of peritonitis, 94 episodes of fungal peritonitis in 92 patients (4.0%) and occurred in 4.8% of patients (Chang et al., 2011).

Previous bacterial peritonitis, prolonged antibiotic use, an extended dialysis regimen, the placement of a peritoneal catheter for an extended period of time, the use of immunosuppressive medications, hospitalization, and concurrent extra-peritoneal fungal infections are risk factors for

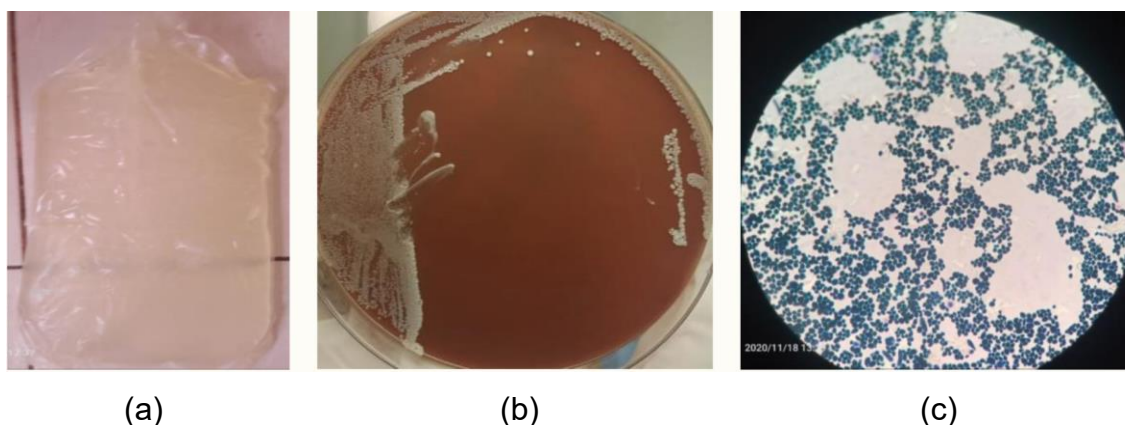
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fungal peritonitis in PD patients (Agudo & García-Martos, 2009). *Candida* species are typically the cause of fungal peritonitis. Compared to *Candida parapsilosis*, *Candida albicans* is a more frequent cause (Prasad Narayan, 2005).

Fungal peritonitis presents with similar clinical symptoms as bacterial peritonitis, including fever and abdominal pain (Prasad Narayan, 2005).

### CASE PRESENTATION

A 46-year old man was admitted to hospital with complaints of abdominal pain for 1 week and worsened in the last 2 days. The PD fluid becomes cloudy and there are complaints of nausea without vomiting, fever, diarrhea or irregular bowel movements. The patient has never experienced complaints like this. The patient also complained that both legs had been swollen for 2 weeks before entering the hospital without dyspnea. The patient is receiving peritoneal dialysis for four years for 4 years. There is a history of hypertension for 8 years, irregular medication consumption and the highest blood pressure reached 180 mmHg.



**Figure 1.** Clinical and Microbiology Finding (a) Cloudy peritoneal fluid; (b) Culture media; Microscopy of *Candida Para-psilosis*

On physical examination the patient appeared moderately ill, *compos mentis*, blood pressure 160/100 mmHg, pulse rate 130 times per minute, respiratory rate 28 times per minute, and temperature 36.0C.

Laboratory examination are carried out when the patient is admitted to the hospital. Haemoglobin concentration was 8 g/dl, leukocyte count was 18,800 103/mm, platelet count was 323,000 103/mm, neutrophil segment 90%, urea 233 mg/dl, creatinine 15.50 mg/dl, sodium 139 mmol/L, potassium 4.50 mmol/L, and albumin value was 2.80. A culture of peritoneal dialysis fluid revealed *Candida para-psilosis*.

Chronic kidney disease stage 5 with peritoneal dialysis and overload, moderate anemia, mild hypoalbuminemia, and peritonitis caused by *Candida* are the diagnoses in this case.

The patient was treated with ceftriaxone 1 gram intraperitoneally every 24 hours, fluconazole 200 mg intraperitoneally, and Dianel 1.5% 2000 cc every 6 hours. The tenchoff PD was kept in place after three days because pain subsided and the PD fluid cleared up. Therapy is continued for up to 14 days.

## DISCUSSION

Fungal peritonitis account for 1% to 15% of peritonitis episodes (Prasad Narayan, 2005). Predictors of fungal peritonitis are a history of previous bacterial peritonitis, prolonged use of antibiotics, a prolonged dialysis program, the installation of a peritoneal catheter, immunosuppressants, hospitalization and extra-peritoneal fungal infections (Agudo & García-Martos, 2009).

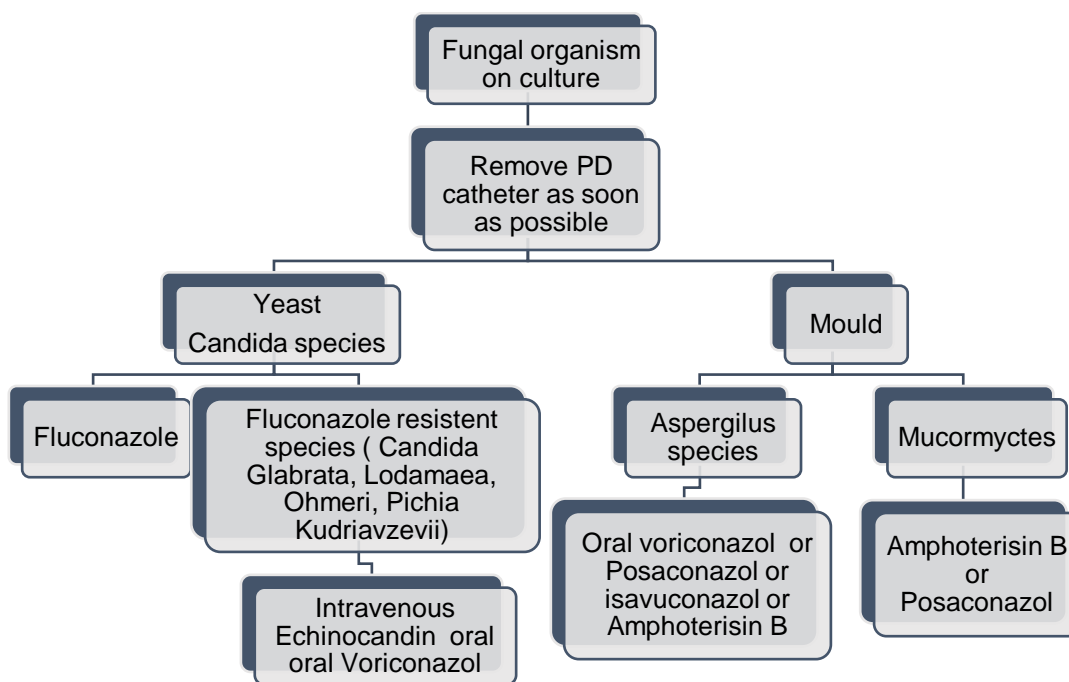
Fungal peritonitis is generally caused by *Candida* species (75%). *Candida albicans* was the most common pathogen (41.5%) and *Candida parapsilosis* (Auricchio et al., 2018; Chang et al., 2011; Li et al., 2022). According to the culture results in this case, *Candida parapsilosis* was the cause of peritonitis.

Fungal peritonitis presents with similar clinical manifestation as bacterial peritonitis, including fever (66.0%), cloudy dialysate (93.6%), and abdominal pain (84.0%). Additional clinical signs include vomiting, diarrhea, and peritoneal irritation. In 39 cases (41.5%), intestinal obstruction complications occurred, and there were case reports involving intra-abdominal abscesses (Chang et al., 2011; Guimarães Rosa et al., 2007; Prasad Narayan, 2005). In this case, the patient reported nausea, cloudy dialysate fluid, and abdominal pain. Swollen feet are caused by a small decrease in the ultrafiltration volume during dwelling.

It is recommended that peritonitis be diagnosed if two or more of the following are present: clinical features consistent with peritonitis, that is cloudy or painful dialysis effluent, dialysis effluent white cell count  $> 100/\text{mL}$  or  $> 0.1 \times 10^9/\text{L}$  (after a dwell time of at least 2 hours), with  $> 50\%$  polymorphonuclear leukocytes (PMN); positive dialysis effluent culture (Li et al., 2022). In these cases that fit the diagnostic parameters are pathogens found on the culture examination, abdominal pain, and cloudy dialysate fluid.

The Gram stain can help support the diagnosis of fungal peritonitis because identifying the fungi can take some time. Prompt empirical treatment with antifungal therapy should be initiated even based on the Gram stain. Accurate pathogen identification and susceptibility profile determination are prerequisites for selecting the appropriate antifungal regimen (Auricchio et al., 2018; Li et al., 2022). Fluconazole is the preferred antifungal treatment for *Candida albicans*,

while other *Candida* organisms may occasionally need voriconazole or echinocandins (Caspofungin, micafungin, or anidulafungin) (Giacobino et al., 2016; Matuszkiewicz-Rowinska, 2009). Two patients received intraperitoneal fluconazole, while three patients received oral fluconazole in a series of case reports that included azole antifungals (Guimarães Rosa et al., 2007). Fluconazole 200 mg was given via dialysate to the patients in these cases, once every 24 hours. Despite the lack of bacterial growth in the culture results, the patient was prescribed ceftriaxone due to leukocytosis. According to study findings, the mortality rate will rise if the white blood cell count in PD fluid is higher than 3,000/mm<sup>3</sup> upon arrival (OR 6.56, 95% CI 1.05 - 40.95) (Nadeau-Fredette & Bargman, 2015).



**Figure 2.** Algorithm for Management of fungal peritonitis (Li et al., 2022).

When a fungal infection is detected, the International Society Peritoneal Dialysis (ISPD) peritonitis guidelines for 2022 advise removing the catheter right away (1C). Following catheter removal (2C), treatment with the proper antifungal medications is continued for at least two weeks, if not longer (Li et al., 2022; Prasad Narayan, 2005). Improvement in complaints and PD fluid becoming clear again indicates an adequate therapeutic response, in this case improvement occurred after 3 days.

Immediate catheter removal is the best option to reduce the high mortality rate of fungal peritonitis due to the frequent formation of biofilm (Giacobino et al., 2016). Treatment failure and mortality rates for fungal peritonitis remain high, although the results obtained are slightly improved with early catheter removal based on observational studies (Chang et al., 2011; Nadeau-

Fredette & Bargman, 2015). Even though anti-drugs are available, catheter removal remains the cornerstone of management of fungal peritonitis. Previous studies reported a mortality rate of 50-91% (Goldie et al., 1996; Wang et al., 2000) Mortality in the group that did not remove the tenchoff catheter increased 2-3 times compared to catheter removal and had a better chance of continuing PD (Chang et al., 2011; Goldie et al., 1996) Research in Australia, catheter removal that late was defined as > 5 days after diagnosis of fungal peritonitis (Miles et al., 2009).

Regardless of the duration of treatment, reinsertion of the catheter and resumption of PD have been reported after a mean period of 15 weeks in less than one third of cases. The PD catheter was removed within 24 hours in 39 patients (41.5%), whereas catheter removal was between 2 and 9 days after fungal peritonitis diagnosis in 42 patients (44.7%). 27 patients (28.7%) died from FP, 59 patients (62.8%) required conversion to haemodialysis, and PD was resumed in 8 episodes (8.5%) (Chang et al., 2011).

Mortality rates were significantly higher in patients with discharge delayed catheterization (13/41, 31.7%) compared with patients with catheter removal within 24 hours (5/39, 12.8%) ( $p < 0.01$ ). Multivariate logistic regression analysis showed that delayed catheter removal, the presence of intestinal obstruction, and higher white blood cell counts in blood and PD waste were independently associated with mortality in birth control patients (Chang et al., 2011). Other studies found that a mortality of 19% and 47% due to technique failure. In the other study, 33% of cases continued peritoneal dialysis with a median delay of 15 weeks (interquartile range 8 - 23) and catheter reinsertion (Nadeau-Fredette & Bargman, 2015).

## CONCLUSION

Antifungals can prevent tenchoff failure and are helpful in cases of Candida-related peritonitis.

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