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Fungal peritonitis secondary to Aspergillosis in a peritoneal dialysis patient

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CASE REPORT

Fungal Peritonitis Secondary to *Aspergillosis* in a Peritoneal Dialysis Patient

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Abstract

Fungal peritonitis remains a serious complication of peritoneal dialysis that carries a high morbidity and mortality. Most cases of fungal infections are due to *Candida species;* however few cases are seen in the setting of *non-Candida* such *Aspergillus, Fusarium, and Mucor*. Prompt peritoneal dialysis catheter removal and early anti-fungal treatment have been considered as best strategies to improve survival.

We present a rare case of a 27-year-old male with focal segmental glomerulosclerosis on peritoneal dialysis (PD) presented to the hospital recurrent episodes of abdominal pain, diarrhea, and cloudy output from his peritoneal catheter. He was found to have fungal peritonitis secondary to *Aspergillosis Fumigatus*. This report highlights that fungal peritonitis should be considered in the differential diagnosis of patients with prolonged antibiotic use, recent bacterial peritonitis, and recent hospitalization. The speciation of *Aspergillosis Fumigatus* carries a rare incidence in this population and voriconazole is the mainstay treatment.

Keywords: Fungal peritonitis, Peritoneal dialysis, *Aspergillosis Fumigatus*

1. Introduction

Acute peritonitis is a common complication of peritoneal dialysis, oftentimes in the setting of bacterial infection.[1] Less than 10% of cases are due to fungal infections.[2] While candida species are the most frequently cultured, other species - Aspergillus, Fusarium, and Mucor - are found in 2–5% of fungal peritonitis cases.[3] Fungal peritonitis carries a high mortality rate of up to 45%.[4]

2. Case description

A 27-year-old male with hypertension and focal segmental glomerulosclerosis on peritoneal dialysis (PD) presented to the hospital 4 days after discharge with recurrent episodes of abdominal pain, diarrhea, and cloudy output from his peritoneal catheter.

- Prior cultures initially demonstrated ***Staphylococcus epidermidis*** for which he was treated with intraperitoneal (IP) vancomycin and gentamicin then he was discharged as he demonstrated symptomatic improvement.

Unfortunately, a few days post-discharge, he continued to have symptoms and was re-hospitalized.

- **Workup**:
  - Peritoneal fluid count: 5000 cells/μL with 74% neutrophils.
  - A CT scan of his abdomen was compatible with peritonitis (Fig. 1).
- **Hospital Course:**
- He was resumed on IV vancomycin and his PD catheter was removed.
- Despite IV antibiotics, he experienced increasing abdominal pain with rising leukocytosis and fever.
- Preliminary peritoneal culture data demonstrated the presence of **mold** with subsequent speciation of ***Aspergillus fumigatus*.**
- Antibiotics were switched to voriconazole 200 mg twice daily for a total of four weeks (Table 1).

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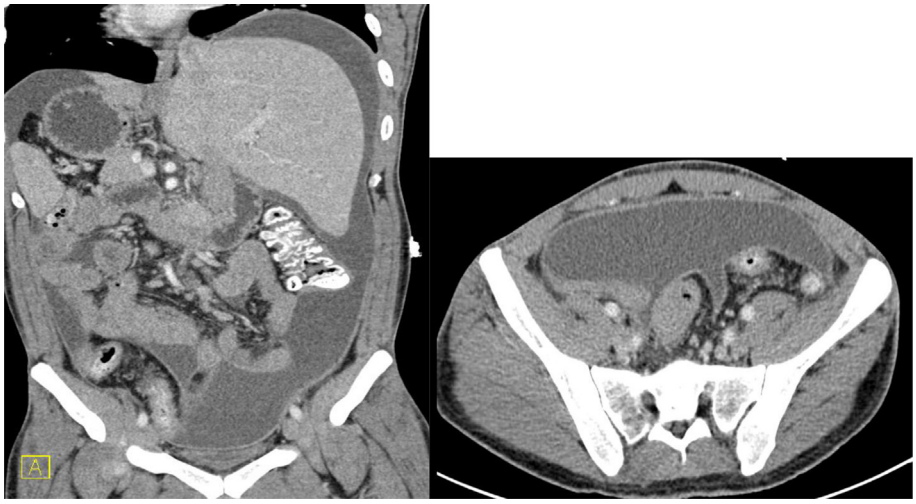

Fig. 1. Computed tomography of the abdomen and pelvis in coronal and axial views demonstrating the presence of significant peritoneal fluid. CT also demonstrated evidence of marked peritoneal enhancement suggestive of ongoing inflammation.

- Repeat paracentesis performed on day 5 of therapy revealed a normal cell count. (see Table 2).

3. Discussion

- PD-associated peritonitis diagnosis should be established when at least two of the following are present: presence of cloudy output/abdominal pain, white cell count >100/μL with >50% polymorphonuclear cells; and positive PD aspirate culture.[5] In addition, the presence of peritoneal eosinophilia in patients on PD should raise the suspicion towards fungi as the culprit agent.[6]
- Recommended empirical antibiotic therapy per last guidelines[5] should be started as soon as the cultures have been obtained with coverage for both Gram-positive and Gram-negative organisms. Gram-negative organisms covered by a third-generation cephalosporin or an aminoglycoside (e.g., gentamicin) and Gram-positive organisms covered by vancomycin or a first-generation cephalosporin. Unless patient has features of future sepsis, IP antibiotics is the preferred route of administration. Once culture has speciated, antibiotic therapy should be adjusted in the case of coagulase-negative staphylococci peritonitis should be treated with IP vancomycin or first-generatio cephalosporins for two weeks.[7]
- Fungal peritonitis due to Aspergillus Fumigatus is rare and associated with high mortality due to diagnostic delay and delayed removal of the indwelling PD catheter.[8]
- Mortality increases with prolonged antibiotic use, recent bacterial peritonitis, and recent hospitalization.[3]
- For PD patients who receive prolonged antibiotic therapy, prophylaxis with anti-fungal may reduce incidence of fungal peritonitis. Recent guidelines discussed 2 randomized controlled trials[9,10] and a systematic review[11] that examined use of either oral nystatin or fluconazole as prophylaxis during antibiotic therapy with significant benefit.[5] Another retrospective cohort study[12] in patients with bacterial peritonitis

Table 1. Aspergillus Fumigatus antifungal sensitivities taken from peritoneal culture data. MIC (Minimum Inhibitory Concentration).

Aspergillus Fumigatus Group	MIC
Isavuconazole	1
Itraconazole	0.12
Posaconazole	≤0.06
Voriconazole	0.5
Amphotericin B	1
Micafungin	≤0.06
Caspofungin	≤0.06
Anidulafungin	≤0.06

Table 2. Abdominal fluid analysis on day of presentation vs day 5 of voriconazole treatment.

	Day 1	Day 5
Appear peritoneal fluid (PF)	Cloudy	Slightly Cloudy
Color PF	Pale Yellow	Yellow
RBC PF	Occasional	Moderate
WBC PF	5095	147
Neutrophils PF %	74	1
Lymphocyte PF %	6	66
Eosinophils PF %	9	4
Other cells PF %	11	29

revealed there is significant reduction of fungal peritonitis with use of prophylactic fluconazole at a dose of 200 mg/day for 7 days.

- The mainstay treatment for Aspergillus Fumigatus fungal peritonitis is voriconazole; patients should be treated for at least four weeks until all symptoms and signs have resolved.[13] Other treatment modalities include intravenous and/or IP administration of amphotericin B monotherapy in combination with fluconazole, or with itraconazole, or with caspofungin, or with ketoconazole. Per the 2016 update by the infectious disease society of America for practice guidelines for the diagnosis and management of Aspergillosis; amphotericin B is an appropriate option for treatment of Aspergillosis only when voriconazole cannot be administered.[14]

4. Conclusion

Fungal peritonitis carries a high mortality rate and is often a missed complication of peritoneal dialysis.

Conflict of interest

The authors have no conflicts of interest to declare.

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