Section: DVL

Case Report

INVASIVE PERITONITIS CAUSED BY GEOTRICHUM CANDIDUM IN AN IMMUNOCOMPETENT INDIVIDUAL- A CASE REPORT

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ABSTRACT

Geotrichum species are uncommon fungal pathogens, usually colonizing the gastrointestinal tract but rarely causing invasive infections, particularly in immunocompetent hosts. Postoperative peritoneal infection due to Geotrichum is extremely rare. We herewith report, a 58-year-old male patient presented with a diffuse abdominal pain for 2 days, associated with vomiting and decreased urine output. On examination, vitals were stable, with diffuse abdominal tenderness and absent bowel sounds. Laboratory investigations revealed leukocytosis and elevated renal parameters. CECT abdomen showed features of small bowel obstruction, likely due to adhesions, with bulky pancreatic head and peripancreatic fluid. Emergency exploratory laparotomy with small bowel resection and anastomosis was performed. Peritoneal cultures showed no growth, but fluid from the paracolic drain grew Geotrichum candidum, susceptible to itraconazole, voriconazole, fluconazole, and flucytosine. The patient was treated with oral itraconazole 200 mg daily for nine days, with complete resolution of symptoms. This case highlights Geotrichum candidum as a rare postoperative pathogen even in immunocompetent patients, emphasizing the need for timely fungal culture and targeted antifungal therapy for optimal outcomes.

INTRODUCTION

Geotrichum is a genus of environmental yeast-like fungi with worldwide distribution found in soil, water, air and commonly as part of the normal human flora. These fungi are members of Endomycetaceae family from Saccharomycetales class. It is the commonest causative agent of geotrichosis.[1,2] Geotrichum candidum is a ubiquitous fungus known to colonize the human skin, respiratory system, and gastrointestinal tract microbiota.[3,4] It mainly affects patients with underlying immunocompromising conditions such as neoplasms, diabetes mellitus, renal impairment, organ transplant, burns and human immunodeficiency virus (HIV) infection. Traumatic inoculation can also lead to the development of disease in an apparently healthy and immunocompetent individual.[5] Disease presentation is highly variable largely due to individual host predisposition. Pulmonary geotrichosis is the most frequently reported form of the disease, but bronchial, oral, vaginal, cutaneous and alimentary infections have also been reported.[6]

Although amphotericin B is the most commonly used drug, agents such as voriconazole, posaconazole and fluconazole can be used based on the susceptibility results.[12,13] The ideal antifungal agent against Geotrichum spp. and the route of administration still remains unclear. The latest International Society of Peritoneal Dialysis (ISPD) guidelines recommends that antifungals be administered for atleast 14 days and may be extended beyond four weeks.[12]

Invasive Geotrichum infections involving the peritoneal cavity are rare and usually occur in the presence of predisposing factors such as surgery, gastrointestinal perforation, or prolonged antibiotic use. We report a rare case of postoperative peritoneal Geotrichum infection in an immunocompetent adult following small bowel resection.

Case Presentation

A 58-year-old male presented to the emergency department with diffuse abdominal pain for two days, sudden onset, dull aching, intermittent, and non-radiating, associated with multiple episodes of vomiting containing food particles, and decreased urine output. There was no history of fever, nausea, altered bowel habits, melena, abdominal distension, weight loss, or loss of appetite. The patient had no known comorbidities such as diabetes, hypertension, tuberculosis, asthma, or seizures.

On examination, vital signs were stable. Cardiovascular, respiratory, and neurological

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examinations were unremarkable. Abdominal examination revealed equal movement of all quadrants with respiration, an inverted midline umbilicus, soft abdomen with diffuse tenderness, no guarding or rigidity, and absent bowel sounds.

Baseline investigations revealed hemoglobin 14.0 g/dL (Biological reference value (BRV)- 13-17 g/dL), total leukocyte count 20,300 /µL (BRV- 4000-11000 cells/cu.mm), neutrophils 89% (BRV- 45-70%), platelet count 3.96 × 10^5/µL (BRV- 1.5-4.5× 10^5/µL), blood urea nitrogen 38 mg/dL (BRV- 6-20 mg/dL), and creatinine 3 mg/dL (BRV- 0.7-1.2mg/dL) with normal liver enzymes. Contrast-enhanced computed tomography (CECT) abdomen showed features of small bowel obstruction, possibly due to adhesions with a transition point; bulky heterogeneous pancreatic head and uncinate process with surrounding peripancreatic fluid and fat stranding.

In view of bowel obstruction secondary to mesenteric infarct, emergency exploratory laparotomy with small bowel resection and anastomosis was performed.

Peritoneal fluid collected intra-operatively was sent for culture, which showed no growth. On post operative day 5, the patient developed abdominal distension and underwent CECT whole abdomen which showed acute necrotising pancreatitis with paralytic ileus.

Later he developed seizures with suspected septic encephalopathy. MRI of the brain showed no acute infarct or haemorrhage. Serum procalcitonin was found to be elevated to 0.727 ng/mL (BRV- <0.046 ng/mL). Culture of fluid from left paracolic drain was sent for microbiological culture. Direct microscopy of the Gram-stained smear revealed occasional pus cells and no organism. Potassium hydroxide (10%) wet mount revealed hyaline hyphal elements as shown in figure 1. After 24 hours of incubation, Sabourauds dextrose agar (SDA) plate showed the growth of dry white hairy colonies as shown in the figure 2. Culture smear revealed gram positive rectangular arthroconidia with hockey stick appearance (figure 3). Urea hydrolysis test was found to be negative and the isolate was identified as Geotrichum candidum by automated identification system (VITEK-MS). Antifungal susceptibility testing was performed and the isolate was found to be susceptible to itraconazole, voriconazole, fluconazole, and flucytosine following which the patient was started on intravenous itraconazole therapy for 12 days.

Due to persistent serous pelvic drain output, repeat ultrasonography of the abdomen revealed no significant fluid collections. As the patient showed progressive clinical improvement, he was discharged with instructions on appropriate wound care and prescribed oral itraconazole 200mg PO once daily for 9 days.

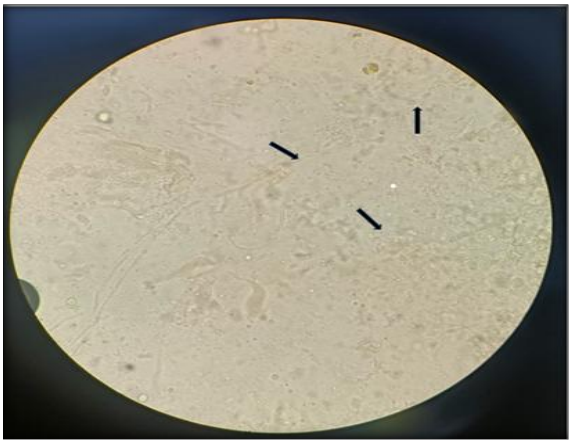

Figure 1: 10% Potassium hydroxide wet mount showing hyaline hyphal elements (marked with arrows) in direct microscopy

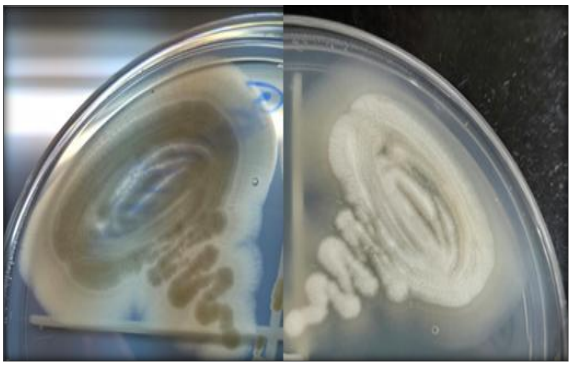

Figure 2: Culture plate showing dry white hairy colonies of Geotrichum candidum

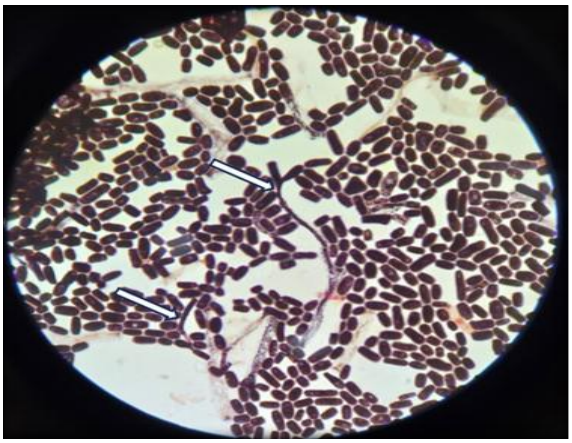

Figure 3: Gram showing the presence of arthroconidia with occasional hockey stick appearance (marked with arrows)

DISCUSSION

Geotrichum is a part of normal microbial flora in the human gastrointestinal system, it can become pathogenic under certain conditions like disruption of mucosal barriers during abdominal surgery. In this case, despite the absence of immunosuppression, postoperative infection occurred, likely facilitated by gastrointestinal tract exposure during surgery and broad-spectrum antibiotic use.

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The isolation of Geotrichum candidum from sterile site fluid (paracolic drain) confirms its pathogenic role. Itraconazole was effective, in line with literature reporting susceptibility of most Geotrichum strains to triazole antifungals, though resistance to echinocandins is common. To date, very few cases of Geotrichum peritonitis in immunocompetent adults have been reported and the details of cases reported from patients of peritoneal dialysis and post operative peritonitis are given in the table 1. This case underscores the need to consider rare fungi in postoperative infections.

Table 1: Comparison between the present case and previously reported Geotrichum case reports

Case Report	Patient profile & context	Risk factors	Outcome
Present case	58-year-old male, small bowel obstruction surgery	Postoperative; immunocompetent	Recovered
CAPD-associated peritonitis[8]	34 year old male on continuous ambulatory peritoneal dialysis	Chronic renal failure, peritoneal dialysis	Recovered
Dialysis related peritoneal infection[9]	Patient in peritoneal dialysis unit	Peritoneal dialysis	Death due to cardiogenic shock
Postoperative peritonitis[10]	Patient underwent surgery for prepyloric perforation	Post-op abdominal intervention	Recovered

Most previously reported cases of Geotrichum peritoneal infections have occurred in the context of peritoneal dialysis, typically in immunocompromised or device-associated settings.[8,9,10] The current case is distinctive as it represents a postoperative infection following exploratory laparotomy in an otherwise immunocompetent patient, making it a rare clinical occurrence. Diagnosis, consistent with previous reports, relied on culture and morphological features, including arthroconidia formation and urease negativity, with antifungal susceptibility testing guiding treatment decisions. Devnikar et al., in his study molecular sequencing confirmed the organism, underscoring the role of advanced diagnostics in rare fungal infections.[10]

Triazole antifungals have demonstrated efficacy in treating Geotrichum infections.[11] In dialysis-related cases, catheter removal combined with antifungal therapy was critical for recovery. In contrast, our patient achieved complete resolution with itraconazole monotherapy. This highlights the potential for successful outcomes through timely culture, species-level identification, and antifungal sensitivity testing, even in non-canonical contexts.

This case contributes novel evidence of Geotrichum peritoneal infection in a postoperative, immunocompetent host and reinforces the importance of including uncommon fungal pathogens in the differential diagnosis of refractory postoperative peritonitis. Geotrichum infections are rare, but carry a significant mortality among the immunocompromised group, there are no standard guidelines for its treatment. In this case, the patient responded well to itraconazole therapy, although agents such as fluconazole, liposomal amphotericin B have shown to be effective. Additionally, removal of drains has shown to contribute to favorable outcomes in most cases.[9]

CONCLUSION

Geotrichum can cause invasive postoperative infections even in patients without immunosuppression. Early culture and species identification with targeted antifungal therapy are essential for favorable outcomes.

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