



Antifungal Therapy for Complicated Intra-Abdominal Infection: A Case Report

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Abstract

Complicated intra-abdominal infection (cIAI) is a serious condition characterized by the extension of infection beyond the gastrointestinal tract into the peritoneal cavity and is associated with high morbidity and mortality. Management of cIAI requires a comprehensive approach, including prompt diagnosis, adequate source control, and appropriate antimicrobial therapy. This case report describes the role of antifungal therapy in the management of cIAI in a critically ill patient with multiple risk factors for invasive fungal infection. A 52-year-old woman with a history of cervical cancer treated with radiotherapy and chronic hemodialysis presented with abdominal pain, nausea, vomiting, and inability to tolerate oral intake. Diagnostic evaluation revealed obstructive ileus and necrotic ileal tissue requiring exploratory laparotomy and intestinal resection. Postoperatively, the patient was admitted to the intensive care unit and received broad-spectrum antibiotics combined with fluconazole as empirical antifungal therapy. Clinical and laboratory improvements were observed during intensive care management, leading to stabilization and subsequent transfer to a high-dependency unit. This case highlights the importance of considering antifungal therapy in healthcare-associated intra-abdominal infections, particularly among immunocompromised and critically ill patients at risk of Candida infection. Early recognition, adequate source control, and individualized antimicrobial selection remain essential for optimizing patient outcomes.

INTRODUCTION

Complicated intra-abdominal infections (cIAIs) are serious infections that extend beyond the site of origin in the hollow viscus into the peritoneal cavity or other normally sterile intra-abdominal spaces (Bova et al., 2024; Kryvoruchko et al., 2024; Napolitano, 2022; Sartelli et al., 2025; Sartelli, Barie, et al., 2024). These infections are commonly associated with conditions such as perforated appendicitis, bowel perforation, diverticulitis, and postoperative abdominal complications (Abdulmomen et al., 2022; Barie et al., 2023; Devine & Forrester, n.d.; Mekakas & Nagorni, 2022; Potey et al., 2023). Unlike uncomplicated intra-abdominal infections, cIAIs frequently result in peritonitis or abscess formation and often require aggressive medical and surgical management. Due to their severity and complexity, cIAIs remain an important cause of morbidity and mortality worldwide.

The clinical management of cIAIs presents significant challenges because disease progression is often influenced by patient comorbidities, delayed diagnosis, immune status, and the presence of resistant microorganisms (Kayembe & Kayembe, 2025; Maity et al., 2024; Sartelli, Barie, et al., 2024; Sejersen et al., 2026). Patients with malignancy, chronic kidney disease, immunosuppression, or a history of abdominal surgery are particularly vulnerable to severe infection and poor outcomes. Furthermore, healthcare-associated intra-abdominal infections are increasingly complicated by multidrug-resistant organisms, making antimicrobial selection more challenging and requiring broader-spectrum therapeutic strategies.

Effective treatment of cIAIs relies on a multidisciplinary approach that includes early diagnosis, prompt source control, hemodynamic stabilization, and appropriate antimicrobial therapy (Hagiwara et al., 2026; Monnet et al., 2025; Sartelli, Tascini, et al., 2024; Vonny et al., 2026). Surgical intervention remains essential in many cases to eliminate the source of infection and prevent further contamination of the abdominal cavity. Alongside surgical management, antimicrobial therapy plays a critical role in controlling microbial proliferation and reducing systemic inflammatory responses. Delays in initiating appropriate therapy have been associated with increased mortality and prolonged hospitalization (Abubakar et al., 2022; Balada-Llasat et al., 2022; Dayan et al., 2023; Kiekkas et al., 2022; Tenforde et al., 2025).

In recent years, the role of fungal pathogens, particularly *Candida* species, in complicated intra-abdominal infections has gained increasing attention. Critically ill patients undergoing prolonged antibiotic therapy, abdominal surgery, intensive care treatment, or immunosuppressive therapy are at greater risk of fungal involvement. *Candida*-associated intra-abdominal infections are associated with higher mortality rates, longer intensive care unit (ICU) stays, and increased healthcare costs. Therefore, antifungal therapy has become an important consideration in selected patients with healthcare-associated cIAIs.

Current clinical guidelines recommend empirical antifungal therapy for critically ill patients considered at high risk for invasive *Candida* infections. The choice of antifungal agent depends on the patient's clinical condition, severity of illness, previous antifungal exposure, and local resistance patterns. Echinocandins are generally preferred for severely ill patients or those with suspected fluconazole-resistant *Candida* species, whereas fluconazole remains an option for clinically stable patients without significant risk factors for resistance. Appropriate antifungal selection is essential to optimize clinical outcomes and minimize treatment failure.

This case report aimed to describe the use of antifungal therapy in the management of a complicated intra-abdominal infection in a critically ill patient with multiple risk factors for fungal infection. The report highlights the importance of early recognition, individualized antimicrobial management, and multidisciplinary intensive care treatment in achieving favorable clinical outcomes in healthcare-associated cIAIs. This case contributes to the growing body of evidence supporting consideration of fungal pathogens in critically ill patients with healthcare-associated intra-abdominal infections, particularly those with underlying malignancy and renal failure. The case demonstrates that prompt empirical antifungal therapy, when initiated early in high-risk patients, may help prevent progression to invasive candidiasis and reduce ICU length of stay. Furthermore, the favorable outcome following fluconazole monotherapy suggests that, in selected clinically stable patients without prior azole exposure, fluconazole remains a viable and cost-effective alternative to echinocandins. This finding may have implications for antimicrobial stewardship and healthcare resource utilization, particularly in resource-limited settings. This report also underscores the value of comprehensive risk factor assessment in guiding clinical decision-making, potentially reducing unnecessary antifungal exposure while ensuring that patients at genuine risk receive timely and appropriate therapy.

METHOD

This study was conducted using a descriptive case report approach. Clinical data were obtained from the patient's medical records, including medical history, physical examination findings, laboratory results, radiological evaluations, intraoperative findings, treatment

strategies, and intensive care management. The report focused on the use of antifungal therapy in managing complicated intra-abdominal infection in a critically ill patient. Relevant literature on complicated intra-abdominal infections, antimicrobial therapy, antifungal management, and clinical guidelines was reviewed to support the interpretation and discussion. The collected data were analyzed descriptively to describe the clinical course, therapeutic considerations, and patient outcomes.

RESULTS AND DISCUSSION

Case Presentation

A 52-year-old female presented to the emergency department from a cancer center with abdominal pain, inability to eat, nausea, and vomiting for 5 days. Initially, she was scheduled for the 20th of 25 radiotherapy cycles as a follow-up therapy after bilateral salpingo-oophorectomy hysterectomy due to cervical cancer stage IIA2, 5 months prior. She has been undergoing hemodialysis twice a week for the past 5 months. From the nasogastric tube, there was greenish juice with no peristaltic movement. Diagnostic imaging revealed a dilation of the intestines with a projection of the small intestine showing multiple air-fluid levels on the lateral projection. Initial laboratory tests indicated elevated inflammatory markers. After 7 days of ward care, the patient was scheduled for laparotomy exploration surgery. During the surgery, identification of the ileum revealed unhealthy tissue anastomosis approximately 200 cm from the jejunum. Sharp adhesiolysis was performed. Resection was done approximately 100 cm. A jejuno-jejunal side-to-side functional anastomosis was performed using a stapler. The patient moved to intensive care for further treatment.

After the surgery, the patient was on a ventilator, vasopressor, and given broad-spectrum intravenous antibiotics, including meropenem, levofloxacin, metronidazole, and fluconazole as an antifungal agent, to cover a range of potential pathogens commonly associated with cIAIs. From laboratory examination on the first day of ICU care, we observed an increasing lactate value and lymphopenia. On the third day, the clinical condition improved, vasopressor was no longer needed, and from the laboratory examination, the lactate value decreased. After 5 days of ICU care, the patient's clinical condition improved and was moved to a high dependency unit.

Our patient presented to the ER with the main complaint of abdominal pain, inability to eat, nausea, and vomiting for 5 days. The patient had a surgical history 5 months ago for hysterectomy and has been on hemodialysis therapy twice a week since then. Physical, laboratory, and radiology examinations matched with obstructive ileus. From the nasogastric tube, there was greenish juice with no peristaltic movement. Laboratory examination in the ER showed leukocytosis, hyponatremia, hyperkalemia, and elevated urea-creatinine. Abdominal radiology examination showed a dilation of the intestines with a projection of the small intestine showing multiple air-fluid levels. After 7 days of ward care, the patient was scheduled for laparotomy exploration surgery and necrosis of the ileum was found.

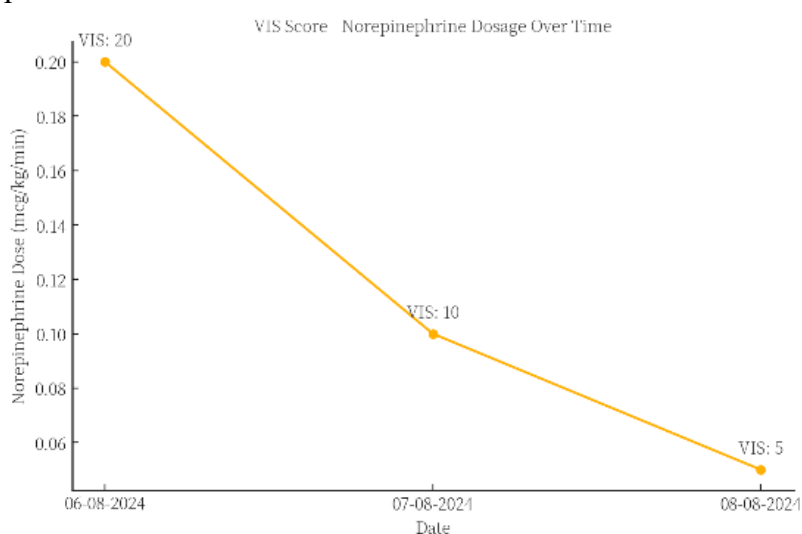
Complicated intra-abdominal infections (cIAIs) are infections that extend beyond the hollow viscus of origin into the peritoneal space or other sterile areas of the abdominal cavity. These infections are associated with peritonitis, with or without abscess formation. Unlike uncomplicated intra-abdominal infections, which involve only the gastrointestinal tract's intramural inflammation, cIAIs require more intensive management due to their potential severity and complexity.

Intra-abdominal infections present a significant clinical challenge due to their complex etiology and the potential for severe outcomes. The epidemiology of these infections varies widely, influenced by factors such as geographic location, healthcare practices, and patient demographics. In particular, healthcare-associated intra-abdominal infections are often complicated by the presence of multidrug-resistant organisms, necessitating a nuanced approach to management. Effective clinical management requires not only the selection of appropriate antimicrobial agents but also timely surgical intervention when necessary. The integration of antimicrobial stewardship principles is crucial in optimizing treatment outcomes and minimizing the development of further resistance. This comprehensive approach ensures that patients receive the most effective care tailored to the specific microbial landscape and resistance patterns encountered in their healthcare setting.

The choice of antimicrobials in the management of complicated intra-abdominal infections is guided by the need to cover a broad spectrum of pathogens, including gram-negative bacilli, anaerobes, and, in some cases, fungi. In healthcare-associated infections, the likelihood of encountering resistant organisms is high, necessitating the use of agents with expanded spectra of activity.

Antifungal therapy is particularly relevant in the management of healthcare-associated intra-abdominal infections, where the risk of fungal involvement, especially by *Candida* species, is significant. Critically ill patients, such as those with upper gastrointestinal perforations or those undergoing prolonged antibiotic therapy, are at increased risk for *Candida* infections. The use of echinocandins (anidulafungin, caspofungin, or micafungin) is recommended for empiric antifungal therapy in severely ill patients considered at risk for infection from *Candida* spp. Fluconazole can be used for empiric antifungal therapy in less severely ill patients with HA-IAI considered at risk for infections from *Candida* spp. For patients at risk for infection due to fluconazole-resistant non-*C. albicans* strains, an echinocandin or voriconazole is suggested.

In our case, the use of fluconazole was to address potential fungal infections, especially in an immunocompromised patient who had been on radiotherapy. The choice of antifungal agent should be guided by the patient's clinical condition, risk factors for fungal infection, and local resistance patterns.



Graphic 1. VIS score graph based on the change in norepinephrine dosage over three consecutive days in ICU

Source: Authors' analysis based on patient medical record data

Overall, the management of cIAI should be tailored to individual patient needs, local resistance patterns, and clinical circumstances to optimize outcomes.

CONCLUSION

Complicated intra-abdominal infection (cIAI) remains a major clinical challenge requiring prompt diagnosis, adequate source control, and appropriate antimicrobial therapy to reduce morbidity and mortality. This case demonstrates that antifungal therapy may play an important role in the management of healthcare-associated cIAI, particularly among critically ill and immunocompromised patients with risk factors for *Candida* infection. The administration of fluconazole in combination with broad-spectrum antibiotics, along with surgical intervention and intensive care support, contributed to clinical improvement in the patient. Early identification of fungal risk factors and individualized antimicrobial selection are essential for optimizing treatment outcomes and preventing further complications. Comprehensive multidisciplinary management remains a cornerstone of effective cIAI treatment.

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