

Case Report

A Case Report: Utilization of Topical Amphotericin in Postoperative Mucormycosis

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Abstract

Description

Mucormycosis is a rare devastating fungal infection with a high mortality rate often associated with diabetic and immunosuppressed individuals. However, infections found in postoperative states and in immunocompetent patients are rare. Systemic liposomal amphotericin is viewed as a first line treatment for mucormycosis in addition to aggressive debridement to prevent the spread of infection. Literature describing the treatment of mucormycosis with both systemic and topical amphotericin B is scarce. We present a case of an immunocompetent male admitted for perforated diverticulitis who received a left hemicolectomy with colostomy creation. During hospitalization, stool from the colostomy bag was reportedly leaking into the wound. The patient was found to have extensive necrotic tissue with mold growing in his postoperative incision site. The wound culture and pathology report confirmed mucormycosis. The patient was treated with intravenous (IV) liposomal amphotericin B, wound dressings with an amphotericin/saline mixture twice daily and serial wound debridements. The patient was discharged in stable condition with successful wound healing.

Keywords

mucormycosis; mucormycosis/drug therapy; bacterial infections and mycoses; postoperative complications; surgical wound infection; necrosis; topical amphotericin

Introduction

Mucormycosis is an infection typically caused by fungi of the Mucorales order with species such as Mucoraceae and Rhizopus being the most common cause of infection. Mucormycosis is typically associated with immunocompromised individuals due to their inability to clear the infection as a result of impaired phagocytosis. Impaired phagocytosis is also associated with people with diabetes hence mucormycosis' predilection for these patients. It has a high mortality rate if not treated promptly with antifungal and surgical debridement. This case report highlights mucormycosis in an immunocompetent individual without diabetes and the treatment with IV amphotericin B, surgical debridement, and also a topical amphotericin mixture applied in wound dressing changes, which yielded a successful outcome.

Case Presentation

A 61-year-old Caucasian male with a history of hypertension presented to the emergency department with epigastric pain and shortness of breath. The patient was found to have a perforated sigmoid diverticulitis with pneumoperitoneum on computerized tomography imaging and admitted to the medical intensive care unit. He received a left hemicolectomy and colostomy creation. Postoperatively, the patient's condition was complicated by intubation and sepsis requiring vasopressors and steroids. Peritoneal cultures from surgery grew *Bacterioides fragilis*, *Escherichia coli* and group C streptococci. The patient was medically managed with cefepime, metronidazole and fluconazole. However, he continued to have fevers despite negative blood and urine cultures. Additionally, the patient's colostomy bag was



Figure 1. Post-op incision revealed extensive necrotic tissue with mold scattered throughout the wound .

found to be leaking stool into the abdominal incision. His post-op incision was reopened and revealed extensive necrotic tissue with mold scattered throughout the wound. (**Figure 1**) The patient underwent serial surgical debridement with deep wound cultures revealing mucormycosis, which was confirmed by pathology. He was also started on intravenous (IV) liposomal amphotericin B 5 mg/kg for a total dose of 450 mg daily and received topical wound treatment with gauze saturated in 250 mg of amphotericin B mixed with 250 ml of normal saline. Twice daily wound dressing changes with this mixture were implemented. The patient was considered

for adjunct treatment with hyperbaric oxygen with wound vac placement and amphotericin irrigation. However, his postoperative wound recovered remarkably well, (**Figure 2**), and he was discharged to a long term acute care facility in stable condition with improved wound healing 11 days after starting treatment with IV amphotericin and topical amphotericin.

Discussion

Mucormycosis is a feared diagnosis for both clinicians and patients alike. With a mortality rate of close to 80% associated with the infection,



Figure 2. Post operative wound healing upon patient discharge to a long term facility.

immediate treatment with amphotericin is paramount upon the slightest clinical suspicion.¹ As in the case presented above, IV liposomal amphotericin B was immediately initiated alongside topical amphotericin B. To our knowledge, there have been no reports in the use of topical amphotericin B in postoperative mucormycosis infections. Its use, however, has been reported in two cases—one involving an infected abdominal mesh, in which 50 mg of amphotericin was diluted in one liter of normal saline and applied to wound packing,² and another involving a burn victim, in which 24 mg of amphotericin was mixed in one liter of sterile water and applied every eight hours as a wound dressing.³ Both cases resulted in successful wound healing after using topical amphotericin. Because of mucormycosis's propensity to cause rapid necrosis,¹ the decision to treat using adjunctive topical amphotericin B was made in hopes of limiting extensive, debilitating surgical debridement. Mucormycosis has been found to infect the gastrointestinal tract.¹ We suspected this to be the source of our patient's infection given the rapid onset of tissue necrosis and visible growth of mold in the wound after stool leaked into the wound. Adjunct treatment with hyperbaric oxygen has been described in literature to help promote angiogenesis and inhibit fungal growth, thereby improving tissue growth and recovery.^{4,5} Since our patient's wound recovered remarkably well on systemic and topical amphotericin, the decision was made not to pursue hyperbaric oxygen therapy. Studies from peer-reviewed literature have reported that iron chelating agents such as deferasirox may also be considered to reduce fungal burden and risk of fungal tissue invasion.^{1,4,6} IV amphotericin B and surgical debridement, however, currently remain the gold standard for the treatment of mucormycosis.^{1,5}

Conclusion

For mucormycosis associated with large wounds or postoperative wounds, treatment should include IV liposomal amphotericin B, wound dressing with an amphotericin B/saline mixture and serial surgical debridement. Adjunct treatment with hyperbaric oxygen and iron chelating agents may also be considered, but more data is needed on its efficacy. However, with the lack of reports and research in the use of topical amphotericin B, more studies

should be conducted to further determine its efficacy in the treatment of mucormycosis.

Conflicts of Interest

The authors declare they have no conflicts of interest.

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