Aggressive debridement and early antifungal therapy in the management of cutaneous mucormycosis: A case report with review of literature

Sebin Sebastian1, Pushpendra Malik2, Chander Bhan3, M K Garg4, Prakash Raj Ujjalsingh1

1Junior Resident, 2Professor, 3Assistant Professor, 4Professor and HOD, Department of General Surgery, BPS Government Medical College, Khanpur Kalan, Sonepat, Haryana, India.

ABSTRACT

Mucormycosis is an infectious disease caused by fungi of the class zygomycetes. These are common environmental organisms that are not harmful to immunocompetent humans. They can cause rapidly spreading necrotizing infections in immunocompromised patients. The most common form is rhinocerebral mucormycosis. Histopathological examination (HPE) shows non-septate or minimally septate broad ribbon-like hyphae invading the blood vessels [1].

The coronavirus disease of 2019 (COVID-19) created a public health crisis, infecting millions of people and causing huge numbers of deaths worldwide. Cutaneous manifestations of mucormycosis can either be primary or secondary diseases. Clinical manifestations can vary from cellulitis, abscess, or ulcer. Standard management includes early diagnosis, surgical debridement, and antifungal therapy. Early initiation of antifungal therapy can lower mortality rates and improve the prognosis of patients. The estimated mortality ranges from 25% to 87%, depending on the site of infection.

Key words: Aggressive antifungal therapy, Coronavirus disease-19, Cutaneous mucormycosis, Early debridement

CASE REPORT

A 52-year-old female patient presented to the emergency department with complaints of right-sided gluteal swelling for 20 days, which was associated with on-and-off fever for 3 days. She also had a history of intramuscular injection at the same site 1 month before and was not a known case of any comorbidity. On examination, there was a 20×20 cm swelling involving the right gluteal region with a central patch of gangrene. The surrounding skin was showing edema. A provisional diagnosis of injection site abscess versus necrotizing fasciitis was made.
On the day of admission, her vitals were stable. But, in the course of the hospital stay, she developed shock and was transferred to the surgical intensive care unit where she was put on inotropic support. The patient was taken to the operation theater for debridement, incision, and drainage.

Intra-operatively, extensive wet gangrene was present along with the abscess cavity (Fig. 1a). Gangrene was seen extending up to the muscle layers. Post-operatively, the ulcer was showing no signs of healing. The ulcer started to expand into the surrounding skin and subcutaneous tissue. The patient was again taken into the operation theater for further debridement. A biopsy of the necrotic tissue was taken and sent for HPE (Fig. 1b). While waiting for the HPE report, the ulcer spread could not be contained. The patient was again taken for a 3rd time to the emergency operation theater for debridement. The HPE showed the presence of a fungal infection with a possibility of mucormycosis (Fig. 2).

The patient was started on liposomal amphotericin daily for 7 days. The results of antifungal therapy were magical. There was no requirement for debridement once antifungal therapy was started (Fig. 3a). The ulcer expansion stopped. The slough was reduced, and the granulation tissue started appearing on the 3rd day. By the 7th day, the ulcer was completely covered with granulation tissue, and no signs of expanding gangrene were present.

The patient also developed refractory hypokalemia during the initial weeks of post-debridement. This was managed by IV potassium supplementation on a daily basis. She also had anemia and required a transfusion of 12 units of packed red blood cell during the course in the hospital. Also, to fulfill the serum protein requirements, she was transfused 14 units of fresh frozen plasma in the hospital. After the second debridement, she suffered bradycardia and hypotension, which were managed by atropine and noradrenaline in the intensive care unit.

The patient was planned for skin grafting 2 months after the admission, and a split-thickness skin graft was performed. The uptake of graft was 100%, and the patient was discharged in a few days (Fig. 3b). She was followed up regularly on an outpatient department basis and does not have any complaints presently.

**DISCUSSION**

Mucormycosis is a rare opportunistic infection caused by fungi. Various case reports of cutaneous mucormycosis are available in the literature. A retrospective observational study conducted on 24 patients with cutaneous mucormycosis comparing the effect of concurrent antifungal therapy and debridement versus sequential initiation of antifungal therapy followed by debridement showed that concurrent antifungal therapy and debridement led to reinfection of freshly debrided margins. An aggressive debridement was essential, along with antifungal therapy. Age, previously unexplored wounds, associated co-morbidity, and trunk involvement can have detrimental effects on patient outcomes [7].

A Guide to Surgical Management of the primary cutaneous mucormycosis by Losee et al. in 2002 describes cutaneous mucormycosis in superficial and gangrenous form. Patients were managed by debridement, intravenous amphotericin B, and delayed surgical reconstruction. This resulted in the complete resolution of the infectious process without radical surgical excision [8]. A systematic review and meta-analysis on the contemporary management and clinical outcomes of mucormycosis published in 2019 advocates that surgery is fundamental to improving survival and must be accessible to all patients. Concomitant surgery and antifungal therapy will significantly lower 90-day mortality as compared to treatments with antifungals alone [9].

A prospective study of mucormycosis from a north Indian tertiary care center showed that the combination of surgery and medical treatment with amphotericin B was significantly better for patient survival as they found a survival rate of 92% in this study. This may be due to the fact that most patients were either in the rhinocerebral or cutaneous categories which were easily diagnosed and treated quickly. 100% survival was seen in cutaneous mucormycosis, which may be due to the aggressive measures
Sebastian et al. Management of Cutaneous Mucormycosis

in early diagnosis and management [10]. The epidemiology, management, and outcome of patients with mucormycosis were studied in a multicentric prospective observational study in 2020 by Patel et al. Approximately 10% of total cases were of cutaneous mucormycosis. Surgical management was done for 79.6% of cutaneous cases. The survival rate was seen to be higher in combined surgical and medical management [11]. Another case report on cutaneous mucormycosis was reported in 2023 in north India by Panchal et al. and showed that aggressive repeated surgical debridement was done to manage the case, but antifungal therapy could be initiated in an early period, and hence, the patient could not be saved [12]. This emphasizes the need for concurrent early surgical and antifungal therapy in the management of cutaneous mucormycosis.

CONCLUSION

The successful management of cutaneous mucormycosis lies in the early initiation of antifungal therapy, which will definitely limit the frequency of surgical intervention and improve the prognosis of the patient, reducing the duration of hospital stay.

REFERENCES