International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2025: 7.089

Cutaneous Mucormycosis of the Abdominal Wall Mimicking Meleney's Gangrene: A Case Report

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Abstract: ***Mucormycosis is a rapidly progressive angioinvasive fungal infection that can cause extensive tissue necrosis and may clinically resemble necrotizing soft-tissue infection. We report a 39-year-old man with longstanding non-compliance with antidiabetic medication who developed a rapidly enlarging ulcerative necrotic lesion of the left abdominal wall without preceding trauma. The lesion was clinically diagnosed as Meleney's gangrene. Emergency debridement was performed, and post-debridement tissue examination demonstrated broad branching fungal profiles consistent with mucormycetes, confirming cutaneous mucormycosis. The patient received serial debridement, liposomal amphotericin B, antibiotics, glycemic control and renal monitoring. Despite treatment, his condition deteriorated with respiratory distress and subsequently multi-organ dysfunction. This case highlights the need to consider mucormycosis in rapidly progressive necrotizing soft-tissue lesions, particularly in patients with uncontrolled diabetes, and emphasizes early tissue diagnosis together with aggressive surgical and antifungal management.***

Keywords: Mucormycosis, Meleney's gangrene, abdominal wall, diabetes mellitus

1. Introduction

Mucormycosis is a rare, rapidly progressive, angioinvasive fungal infection caused by saprophytic mould of the order Mucorales, most commonly Rhizopus and Mucor species, which invade blood vessels causing thrombosis and tissue necrosis and carry high mortality despite treatment (Cornely et al., 2019; Skiada et al., 2020). Cutaneous mucormycosis typically follows direct inoculation of spores through trauma, surgical wounds, burns, or minor skin breaches, and, because vascular invasion drives rapid, progressive soft-tissue necrosis, it can clinically mimic bacterial necrotizing soft-tissue infections such as necrotizing fasciitis or synergistic (Meleney's) gangrene, often delaying correct diagnosis until debridement or biopsy reveals characteristic broad, pauciseptate fungal hyphae on histopathology (İnan & Öncü, 2026; Weimer et al., 2017). Global incidence of mucormycosis is estimated at 0.005–1.7 cases per million population, but India carries a disproportionately high burden, with prevalence estimated at around 140 per million, roughly 70-80 times that of developed countries, driven chiefly by uncontrolled diabetes mellitus, trauma, and, increasingly, cases arising even in patients without classical immunosuppression (Roden et al., 2005; Prakash & Chakrabarti, 2021). A review by Kaushik et al. of cutaneous mucormycosis cases in India found trauma as the risk factor in 59% of cases, followed by diabetes mellitus (28%) and malignancy (6%).(Kaushik, 2012) Given the diagnostic pitfalls posed by its clinical resemblance to bacterial gangrenous infections and the consequences of delayed antifungal and surgical intervention, we report the following case of cutaneous mucormycosis of the abdominal wall masquerading as gangrene, to highlight the clinical presentation, diagnostic approach, and management of this uncommon and often misdiagnosed entity.

2. History

A 39-year-old male, a known diabetic with longstanding non-compliance to anti-diabetic medications, presented with a spontaneously developing lesion over the left side of the abdominal wall for 1 week. The lesion was initially small, measuring approximately 1 × 1 cm, and gradually increased in size to approximately 15 × 10 cm over the course of one week. The patient also gives a history of on-and-off low-grade fever during this period. Initially, the patient self-medicated with medicines obtained from a local chemist; however, there was no symptomatic relief, and the lesion continued to enlarge and spread over the left side of the abdomen. The pain has progressively increased in severity and is localized to the affected area. There is no history of preceding trauma, insect bite, burns, or similar lesions elsewhere on the body. There is no history of purulent discharge or bleeding from the lesion. There is no history of nausea, vomiting, abdominal distension, altered bowel habits, or urinary complaints.

3. Clinical Examination

A single large ulcer necrotic lesion is present over the left anterolateral abdominal wall, extending medially towards the midline. The lesion measures approximately 15 × 10 cm with an irregular oval shape. The overlying skin shows extensive in Figure 1. Margins are irregular, ill-defined, erythematous, and indurated. The surrounding skin is edematous with diffuse cellulitic changes extending beyond the visible margins. Purplish black discoloration with areas of crusting, greyish slough and necrotic eschar depicted The floor is predominantly covered with black necrotic tissue with occasional areas of unhealthy granulation tissue. No active bleeding is noted. On palpation, the lesion is tender, warm, and indurated. The necrotic tissue is insensate in places. The surrounding skin is tender with woody induration. There is no obvious crepitus on palpation. The lesion appears to involve

the skin, subcutaneous tissue, and underlying abdominal wall fascia, with suspicion of extension into the superficial muscle plane. There is no obvious bowel or intra-abdominal viscus exposure. No palpable regional lymphadenopathy. The wound had extensive devitalized skin and subcutaneous tissue with greyish fascia, minimal bleeding on incision, and foul-smelling necrotic tissue suggestive of a necrotizing soft tissue infection.

The lesion progressed rapidly, clinically diagnosed as Meleney's gangrene involving the left abdominal wall.

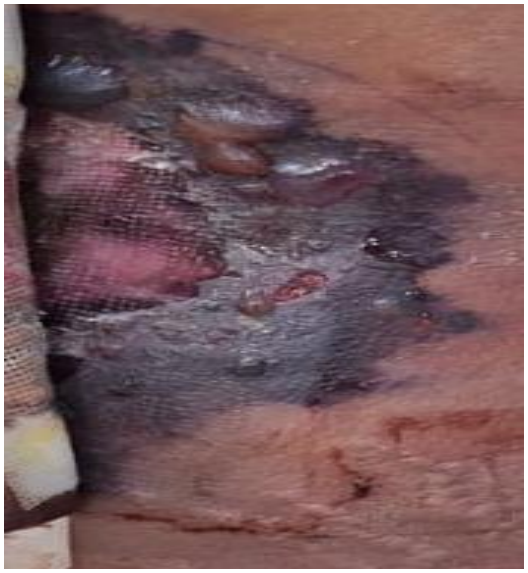

Figure 1: Ulceronecrotic lesion over the left anterolateral abdominal wall

4. Investigations

Post-debridement tissue sent for histopathological and microbiological examination confirmed mucormycosis. On the surface there is colonization by broad branching fungal profiles consistent with morphology of mucoromycetes'. Lateral abdominal wall tissue showed necroses tissue with colonization by mucoromycetes (Figure 2.1, 2.2)

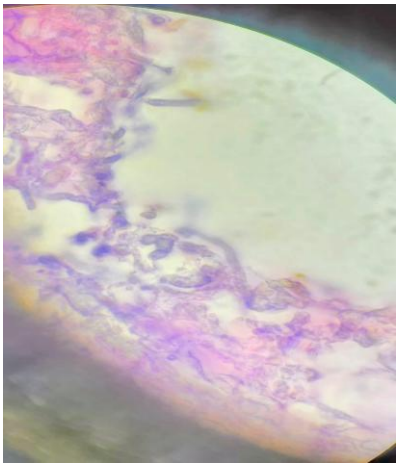

Figure 2.1: Histopathological appearance showing broad branching fungal profiles consistent with mucormycetes

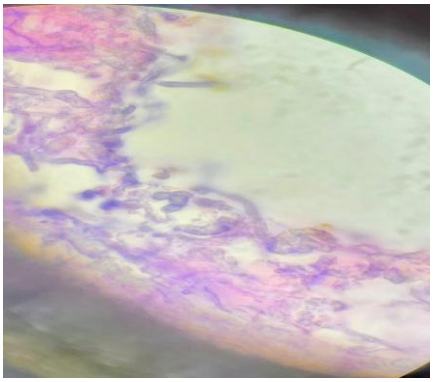

Figure 2.2: Histopathological appearance showing broad branching fungal profiles consistent with mucoromycetes.

5. Treatment

The patient underwent emergency surgical debridement of the necrotic abdominal wall tissue at presentation. Following confirmation of mucormycosis on tissue culture, he was started on antifungal therapy Injection Liposomal Amphotericin B 300mg in 500 ml D5, intravenous antibiotics, glycemic control measures, renal function monitoring during amphotericin therapy. Serial debridement of the abdominal wall were performed over the course of admission to control the spread of necrosis. During the hospital course, the patient required endotracheal intubation for respiratory distress and was subsequently extubated, and was re-intubated following respiratory distress

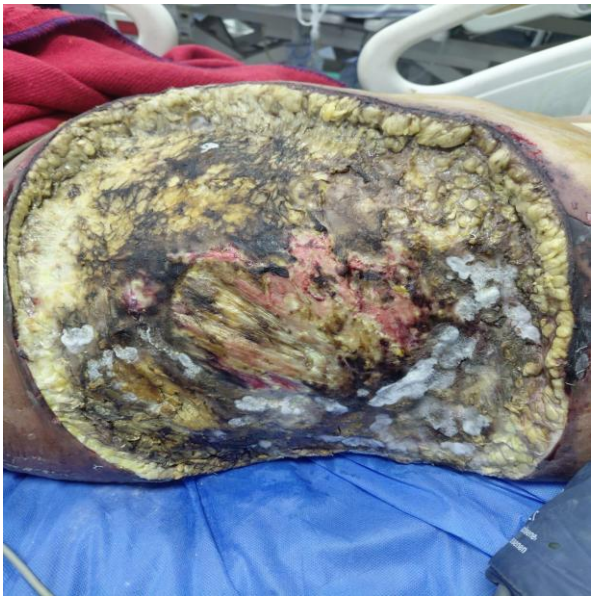

Figure 3: Abdominal wall wound following serial debridement

6. Outcome and Follow-Up

Despite serial debridement and antifungal therapy, the patient's condition progressively deteriorated. He developed fever, breathlessness & approximately one month after initial presentation, he succumbed to irreversible multi-organ dysfunction syndrome (MODS).

7. Discussion

This case illustrates the convergence of two separately lethal surgical emergencies Meleney's gangrene and mucormycosis in a single patient with uncontrolled diabetes, the single most consistently identified risk factor for both conditions.

Necrotizing soft tissue infections of the abdominal wall classically present insidiously, often mimicking simple cellulitis or an abscess before rapidly progressing to frank gangrene. Common causes of death in such cases include sepsis, ARDS, disseminated intravascular coagulation, septic shock, acute renal failure, and multi-organ failure precisely the trajectory seen in this patient. The superimposed identification of mucormycosis on tissue culture adds a second, independently aggressive pathological process: prior reports of post-operative abdominal wall mucormycosis describe a similarly relentless course, requiring multiple extensive debridement that progressively remove large portions of the abdominal wall, sometimes extending onto the chest wall, with amphotericin B as the antifungal mainstay once renal function permits its use.

Several features make this combination particularly dangerous:

1) Diagnostic delay: Both Meleney's gangrene and cutaneous mucormycosis can initially resemble bacterial cellulitis, and fungal co-infection is rarely suspected until tissue culture returns – by which time extensive tissue loss has often already occurred.
2) Uncontrolled diabetes as a unifying risk factor: Poor glycemic control impairs neutrophil phagocytosis and chemotaxis, facilitating both bacterial synergistic infection and fungal germination, as has been well described in mucormycosis epidemiology generally.
3) Therapeutic conflict: Aggressive serial debridement, while necessary, causes significant physiological stress in an already septic patient, and nephrotoxic antifungal therapy (amphotericin B) must be carefully balanced against evolving renal compromise in a critically ill patient.
4) High baseline mortality even in isolation: Meleney's gangrene alone carries a mortality rate of approximately 34%, rising further with diagnostic delay, and mucormycosis independently carries comparably high mortality even with prompt antifungal and surgical therapy. The combination of both processes in one patient likely compounds this risk substantially, although the exact mortality of this specific combination is not well-quantified in existing literature, reflecting its rarity.This case reinforces that even with appropriate recognition, antifungal initiation and aggressive surgical control, outcomes in this combined infection can remain poor underscoring the importance of a high index of suspicion at first presentation, early tissue sampling for both bacterial and fungal pathogens, and aggressive glycemic and metabolic optimization as adjuncts to surgical and antifungal therapy from the outset, rather than after clinical deterioration prompts escalation.

8. Conclusion

Abdominal wall mucormycosis superimposed on Meleney's gangrene in an uncontrolled diabetic is a rare but highly lethal combination. Despite serial aggressive debridement and antifungal therapy, this patient succumbed to septic shock with MODS approximately one month after presentation. Early suspicion of fungal co-infection in any rapidly progressive necrotizing soft tissue infection, particularly in poorly controlled diabetics, and prompt combined surgical and antifungal management remain the only available means of improving what continues to be a grave prognosis.

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