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First Author and corresponding author

Dr Dheer Jaiswal; Junior Resident,

MGM Medical College, Chhatrapati Sambhaji Nagar, +91 8975898989

Second Author

Dr. Reeta Taksali; Professor Department of Pathology, MGM Medical College, Chhatrapati Sambhaji Nagar, +91 9325378882

Third author

Dr. Dr. C.P. Bhale; Professor and HOD, Department of Pathology, MGM Medical College, Chhatrapati Sambhaji Nagar, +91 9371012383

GASTROINTESTINAL MUCORMYCOSIS: A CASE REPORT

Subject: Pathology

Full Address for Hard Copy with Name:

Dr Dheer Jaiswal, Kailash 67, Venkatesh nagar, Jalna road, Chh. Sambhaji Nagar, 431003.

Mobile No.: +91 8975898989

Email ID: jaiswals1010@gmail.com

Abstract:

Introduction: Gastrointestinal mucormycosis is a rare but life-threatening fungal infection caused
by Mucorales species, primarily affecting immunocompromised individuals. It often presents
with non-specific symptoms, leading to delayed diagnosis and poor prognosis, prevalence of
which is less than 7%.

Case summary: A 17-year-old male with B-cell Acute Lymphoblastic Leukemia (B-ALL) presented with acute abdominal pain and distension. Initially suspected to have small bowel obstruction,
ultrasound revealed mild hepatomegaly, moderate ascites, and gallbladder wall thickening. Despite being immunocompromised, a fungal infection was not clinically suspected; pcr and
fungal culture were not done, however, this possibility should not be overlooked. Histopathology confirmed mucormycosis with broad, aseptate hyphae, angioinvasion, and ischemic necrosis.

Histopathology and Cytology: Microscopy shows broad, aseptate hyphae with right-angle branching. Angioinvasion leads to vascular thrombosis, necrosis, and infarction, with inflammatory infiltrates necrotic debris, ribbon-like hyphae, angioinvasion, hemorrhage, and infarction, with minimal or absent
septation. PAS and H&E stains aid diagnosis.

Discussion: The pathologic hallmark of mucormycosis is angioinvasion leading to ischemic necrosis and
infarction. Diagnosis is often challenging due to overlapping clinical presentations. Infection is acquired through ingestion of contaminated food/drinks, with fungal spores colonizing gastrointestinal mucosa. Early identification using histopathology, fungal culture is crucial.

Conclusion: Early clinical suspicion, combined with histopathology and fungal culture, is crucial for
diagnosing gastrointestinal mucormycosis. Antifungal therapy and surgical intervention remain key to improving patient outcomes.
Keywords: Mucormycosis, ischemic necrosis, infarction.

Introduction:

Mucormycosis is an opportunistic fungal infection caused by organisms of the order Mucorales. While the rhino-orbital-cerebral form is the most frequently encountered, gastrointestinal (GI) involvement is rare, accounting for less than 7% of reported cases [1]. GI mucormycosis is associated with a high mortality rate, often exceeding 50%, largely due to delayed diagnosis and late initiation of appropriate treatment [2]. The disease primarily affects immunocompromised individuals, such as those with hematological malignancies, uncontrolled diabetes mellitus, or prolonged neutropenia.

The pathogenesis involves ingestion of fungal spores through contaminated food or water, followed by colonization of the GI mucosa. Once established, the fungus demonstrates a strong propensity for angioinvasion, leading to thrombosis, ischemia, and tissue necrosis [3]. Clinical manifestations are nonspecific—ranging from abdominal pain and distension to gastrointestinal bleeding—often mimicking more common surgical emergencies.

Given the nonspecific presentation, diagnosis requires a high index of suspicion, particularly in immunosuppressed patients. Histopathology remains the gold standard, revealing broad, aseptate hyphae with right-angle branching. Early diagnosis is crucial because delay in treatment significantly worsens the prognosis. The mainstay of management includes a combination of aggressive surgical debridement and systemic antifungal therapy with agents such as amphotericin B [4,5]. This report describes a case of gastrointestinal mucormycosis in a leukemic patient, emphasizing the challenges in diagnosis and the importance of early recognition in improving clinical outcomes.

Case Description:

A 17-year-old male with a known diagnosis of B-cell acute lymphoblastic leukemia (B-ALL) presented with acute onset abdominal pain and distension. He was undergoing chemotherapy and had severe neutropenia at presentation. The initial clinical impression was small bowel obstruction. Ultrasound of the abdomen revealed mild hepatomegaly, moderate ascites, and gallbladder wall thickening. No specific evidence of fungal infection was suspected at this stage, and PCR or fungal cultures were not performed.

The patient's condition deteriorated, and exploratory laparotomy was performed. Intraoperative findings included necrotic bowel segments, which were resected. Histopathological examination showed broad, ribbon-like, aseptate fungal hyphae with right-angle branching, extensive angioinvasion, vascular thrombosis, ischemic necrosis, and associated inflammatory infiltrates. These features were consistent with mucormycosis.

PAS and H&E stains aided in visualization.

Discussion:

Gastrointestinal mucormycosis, though rare, is a rapidly progressive and frequently fatal infection, especially in immunocompromised individuals [1,2]. The disease often remains undiagnosed until advanced stages due to its nonspecific presentation, leading to delays in treatment initiation. The pathologic hallmark is angioinvasion, where fungal hyphae penetrate blood vessels, causing thrombosis, ischemic necrosis, and subsequent tissue infarction [3].

In the present case, the patient's immunosuppressed state due to leukemia and chemotherapy was a significant predisposing factor. While the clinical and radiological features suggested small bowel obstruction, the absence of early microbiological testing delayed targeted antifungal therapy. This underscores the need for heightened clinical

suspicion of invasive fungal infections in high-risk patients presenting with unexplained abdominal symptoms.

The mainstay of diagnosis is histopathological identification of characteristic hyphae in tissue samples, with fungal culture providing species-level confirmation [4]. However, cultures are often negative due to the fragile nature of the hyphae and prior antifungal exposure. Early initiation of treatment is critical, with surgical resection of necrotic tissue combined with high-dose intravenous amphotericin B as the recommended approach [5]. Delayed or inadequate therapy is associated with poor survival rates.

This case emphasizes that in immunocompromised patients, even common gastrointestinal complaints should prompt consideration of invasive fungal infections, particularly when initial workup is inconclusive. Adoption of rapid diagnostic techniques, such as PCR-based assays, could further aid early detection and improve prognosis.

Conclusion:

Gastrointestinal mucormycosis is a rare but deadly infection, particularly in immunocompromised hosts. Its nonspecific clinical presentation often leads to delayed diagnosis and poor outcomes. A high index of suspicion, early histopathological confirmation, and prompt initiation of combined surgical and antifungal therapy are crucial for improving survival. This case highlights the importance of considering mucormycosis in differential diagnoses of acute abdomen in immunocompromised patients.

Acknowledgement

The authors express their sincere gratitude to the Management and Administration of MGM Medical College, Chhatrapati Sambhaji Nagar, for providing the necessary facilities and support to carry out this work. We are also thankful to the Departments of Anatomy and Pharmacology for their cooperation and assistance throughout the preparation of this manuscript. The authors further acknowledge with appreciation the contributions of all researchers whose work has been cited in this article.

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