Invasive Rhino-Orbital Mucormycosis in a Middle-Aged COVID-19 Patient: A Case Report

FUH CHOWDHURY[a], AK KUNDU[b], S AMAN[c], MS ARAFAT[d], MS BARI[e], MT MIAH[f],

Abstract

Background: COVID-19 has been associated with diverse clinical manifestations, among which rhino-orbital-cerebral mucormycosis is increasingly reported. This severe, invasive fungal infection predominantly affects immunocompromised individuals. High-dose corticosteroid use during severe COVID-19, together with diabetes mellitus, increases susceptibility.

Case Presentation: We report one of the earliest cases of rhino-orbital-cerebral mucormycosis in Bangladesh occurring after severe COVID-19 pneumonia in a middle-aged diabetic male. The patient developed right-sided headache, facial pain, and acute vision loss while on corticosteroid therapy. Imaging and histopathology confirmed mucormycosis. Surgical debridement, exenteration of the affected eye, and antifungal therapy with amphotericin B followed by oral posaconazole led to clinical improvement.

Conclusion: This case underscores the importance of early suspicion of mucormycosis in diabetic COVID-19 patients treated with corticosteroids and demonstrates the critical value of multidisciplinary management in improving outcomes.

Keywords: Rhino-orbital mucormycosis, COVID-19, Diabetes mellitus, Steroid therapy, Opportunistic fungal infection, Bangladesh.

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Introduction

Mucormycosis is an invasive fungal infection caused by fungi of the order Mucorales. It is acquired by inhalation or direct inoculation of fungal spores. Coinfection with mucormycosis in COVID-19 patients is rare but serious, especially in individuals with uncontrolled diabetes or receiving high-dose corticosteroids. During the second wave of COVID-19, India reported a surge in mucormycosis cases, while Bangladesh documented only a few. This report describes a case of rhino-orbital-cerebral mucormycosis associated with diabetes and severe SARS-CoV-2 infection.

Case Presentation

A middle-aged diabetic truck driver presented to Dhaka Medical College Hospital with a 20-day history of right-sided headache and a 15-day history of right eye drooping and vision loss. He had recently recovered from severe COVID-19 pneumonia treated with high-dose dexamethasone (20 mg/day) and insulin. Examination revealed multiple cranial nerve palsies involving CN I, II, III, IV, V (1st and 2nd divisions), VI, and VII (LMN type). Laboratory findings showed neutrophilic leukocytosis, elevated inflammatory markers, and impaired glycemic control. Chest X-ray demonstrated bilateral lower lobe consolidation. MRI and MRV excluded cerebral venous thrombosis.

a. Dr. Forhad Uddin Hasan Chowdhury, Registrar, Department of Medicine, Dhaka Medical College Hospital, Dhaka, Bangladesh.
b. Dr. Animesh Kumar Kundu, Resident, Department of Microbiology, Dhaka Medical College, Dhaka, Bangladesh.
c. Dr. Sakib Aman, Registrar, Department of Medicine, Dhaka Medical College Hospital, Dhaka, Bangladesh.
d. Dr. Mohammad Shaharior Arafat, Assistant Professor, Department of Head, Neck and Otolaryngology, Dhaka Medical College Hospital, Dhaka, Bangladesh.
e. Professor Md Shafiqul Bari, Professor, Department of Medicine, Dhaka Medical College Hospital, Dhaka, Bangladesh.
f. Professor Md. Titu Miah (Retd.), Professor, Department of Medicine and Principal, Dhaka Medical College, Dhaka, Bangladesh.

Address of Correspondence: Dr. Forhad Uddin Hasan Chowdhury, Registrar, Department of Medicine, Dhaka Medical College Hospital, Dhaka, Bangladesh. Mobile: 01712101875, E-mail: drmarufsomc@gmail.com

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CT orbit and paranasal sinuses revealed optic nerve thickening and extensive sinus inflammation. Endoscopic sinus debridement was performed. Microscopic examination revealed broad, aseptate, right angle branching hyphae of mucormycete. Empirical liposomal amphotericin B (5 mg/kg/day) was initiated. Due to renal impairment and drug shortage, amphotericin B deoxycholate was substituted. The patient later underwent right eye exenteration to reduce fungal burden and was discharged on oral posaconazole for three months.

Outcome

Three weeks after initiation of surgical and antifungal therapy, repeat rhinoscopy showed no fungal growth. Renal function normalized (serum creatinine 1.23 mg/dL). The patient demonstrated stable recovery at one-month follow-up.

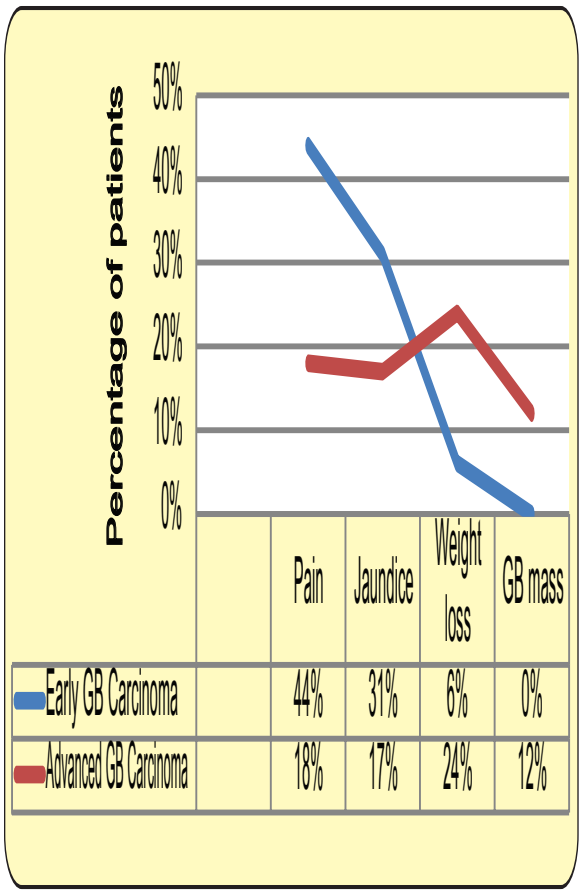

Figure 2: *Right upper eyelid drooping and right facial swelling*

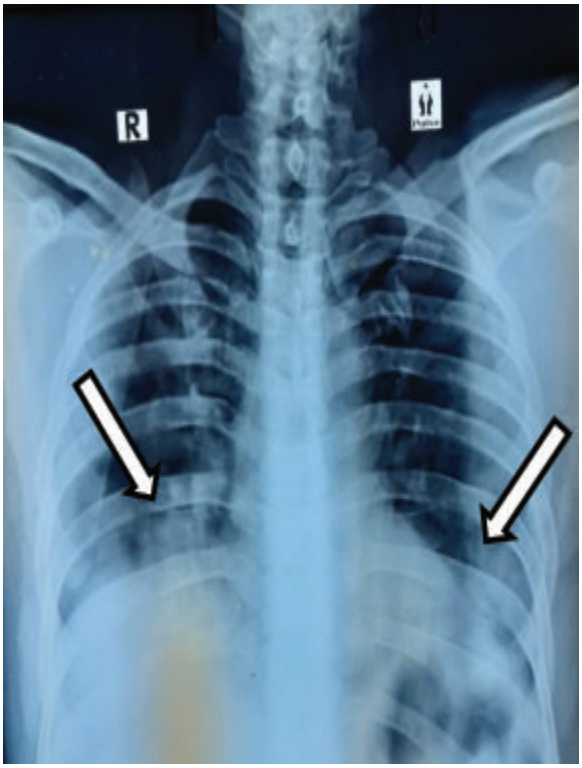

Figure 1: CXR P/A view shows consolidation in both lower lobes

Figure 3: *Right eye congestion*

Figure 4: *CT scan shows thickening and irregularity of medial rectus superior and levator palpebrae superioris*

Figure 5: *CT scan of PNS shows opacification of maxillary, ethmoid and sphenoid sinus evidenced by rim of soft tissue thickening along the paranasal sinus with gas fluid level.*

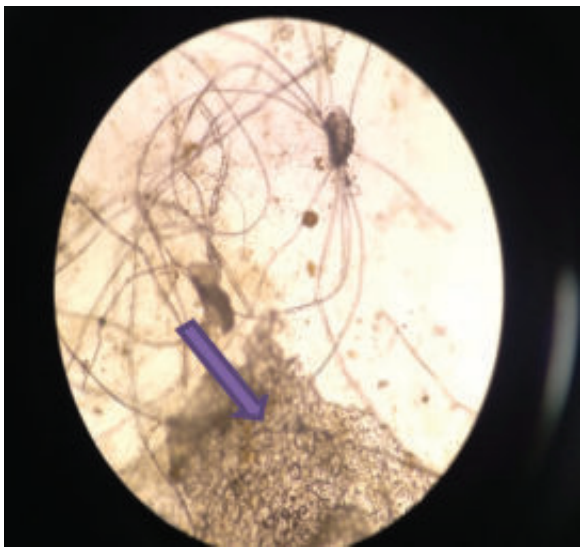

Figure 6: *Microscopic examination shows numerous, broad, aseptate tissue invasive hyphae of mucormycetes*

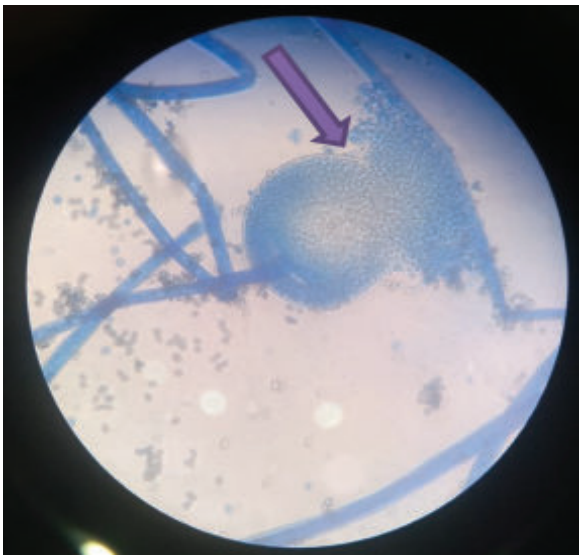

Figure 7: *Microscopic view of Rhizopus from SDA agar plate showing rupture of sporangial sac in lactophenol blue preparation*

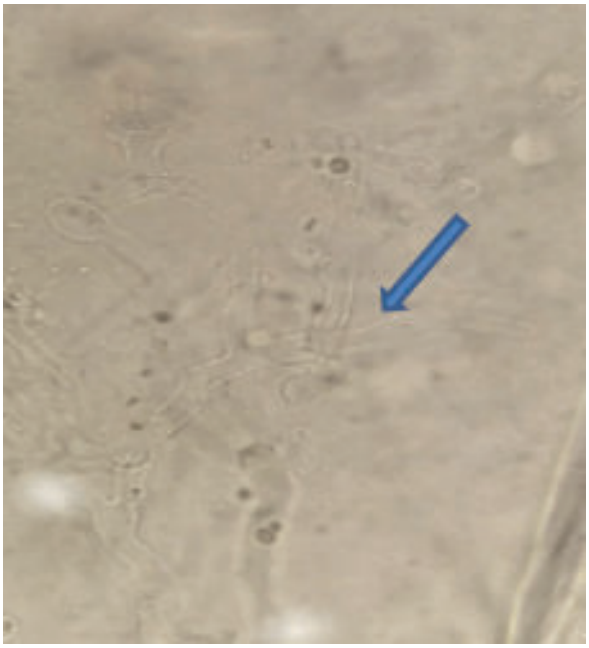

Figure 8 : *Microscopy view of broad, aseptate, right angle branching hyphae of Mucormycete*

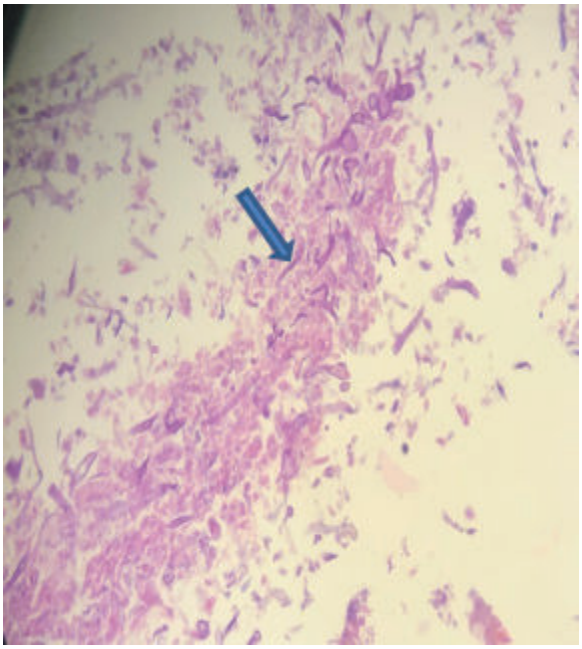

Figure 9: *showing cut section hyphae of mucormycetes in maxillary sinus tissue cytology with H&E*

Discussion

Corticosteroids and immunomodulators have proven beneficial in severe COVID-19 but can induce secondary infections due to immunosuppression. Diabetes mellitus, corticosteroid therapy, and COVID-19 together create an ideal setting for mucormycosis. Studies from India identified diabetes (78%) and corticosteroid exposure (87%) as predominant risk factors among COVID-19-associated mucormycosis cases. Early diagnosis, surgical debridement, and prompt antifungal therapy remain the cornerstones of management. In resource-limited settings, liposomal amphotericin B scarcity necessitates careful renal monitoring when using conventional amphotericin formulations.

Conclusion

Clinicians should maintain a high index of suspicion for mucormycosis in diabetic COVID-19 patients receiving corticosteroids. Timely multidisciplinary intervention is crucial for reducing morbidity and mortality.

Statement of Ethics

Informed written consent for publication of the case details and photographs was obtained from the patient.

Conflict of Interest

The authors declare no conflict of interest.

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