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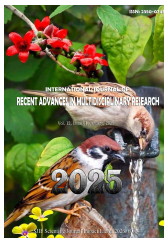

RESEARCH ARTICLE

VISUAL INSIGHTS INTO GASTRIC AND HEPATIC MUCORMYCOSIS: A PICTORIAL OVERVIEW

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ABSTRACT

We report a case of a 51-year-old male with controlled hypertension and recent severe COVID-19 infection treated with high-dose steroids, Bevacizumab, and Remdesvir, presenting with black tarry stools, upper abdominal pain, and paleness, with laboratory findings showing severe anemia (hemoglobin 5.6 g/dL) and liver lesions, upper gastrointestinal endoscopy revealed a large excavating ulcer from the fundus to the antrum, aspirate culture confirmed *Mucor* spp., leading to a diagnosis of gastric mucormycosis, treated with intravenous liposomal amphotericin B followed by posaconazole, and a conservative approach was taken due to high surgical morbidity, with significant clinical improvement over three months, highlighting the importance of early diagnosis and antifungal therapy in immunocompromised patients.

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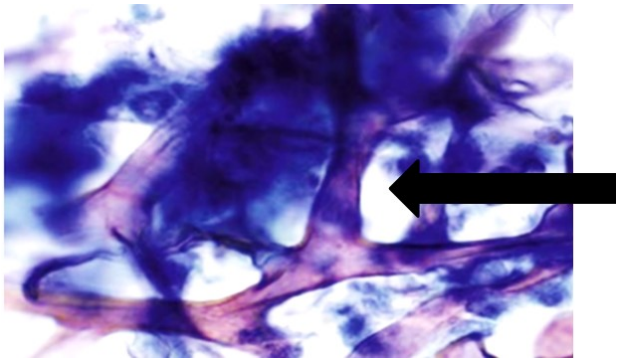
INTRODUCTION

51 year old male, hypertensive controlled on medications with history of severe COVID-19 infection 2 weeks back, treated with pulse steroids (methylprednisolone-125 mg for 3 days), Bevacizumab and remdesvir ,managed on non-invasive ventilation, presented with complaints of black tarry foul smelling stools with pain upper for 2 days along with generalised paleness of skin.He presented to outside hospital where he received blood transfusions (haemoglobin-4 g/dl) and referred to us for further management . On examination he had tachycardia (pulse rate-126 beats /min) and tenderness in upper abdomenrest examination was unremarkable. His laboratory examination revealed total leucocyte count-10240 per microliter, haemoglobin level was 5.6 g/dL, and the platelet count 238,000 per microliter. The erythrocyte sedimentation rate was 50 mm per hour (reference range, 0 to 20), and the C-reactive protein level was 58 mg/L (normal <10 mg/L), kidney function test, liver function blood sugar level were within normal limits, ultrasound revealed multiple small hypo echoic lesions in liver.

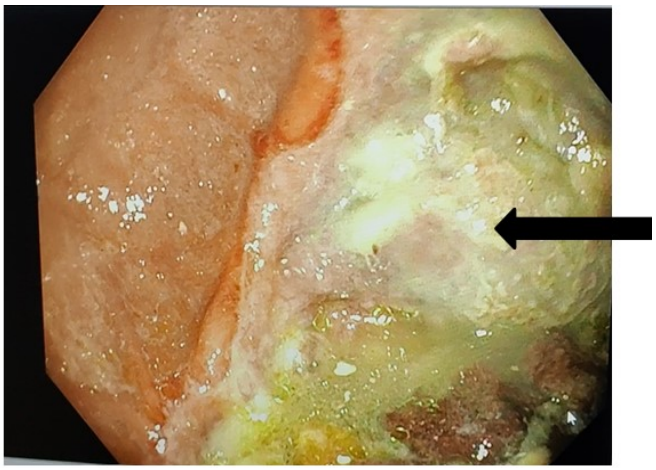
With suspicion of bleeding peptic ulcer, due to past history of similar abdominal pain relieved on taking antacids and proton pump inhibitor and recent steroid intake we proceeded with upper gastrointestinal endoscopy which clinched the diagnosis(Panel 1a and 1b)-Large excavating ulcer of size 10*10 cm extending from fundus till atleast upper part of antrum, biopsy was not taken due to risk of iatrogenic perforation so aspirate was taken which showed broad aseptate hyphae and culture later grew *mucor* spp. The patient was initiated on intravenous liposomal amphotericin B followed by posaconazole. It was decided to be treated conservatively due to marked morbidity associated with total gastrectomy. During a three-month follow-up, the patient showed remarkable clinical improvement. Serial imaging demonstrated reduction in the size of hepatic lesions. Gastric mucormycosis is a serious fungal infection that typically occurs in individuals with conditions such as uncontrolled diabetes, hematologic malignancies, organ transplant recipients, and those undergoing immunosuppressive therapy (like in our case). It can lead to tissue invasion, necrosis, and disruption of blood

vessels within the stomach or can get secondarily infected leading to the development of hematemesis, or melena as in our case. Prompt recognition of gastric mucormycosis plays a pivotal role in preventing the mortality and morbidity that loom over this insidious fungal infection.

PANEL1 a: Aspirate from the slough tissue in stomac)- Broad, ribbon-like, aseptate hyphae with right-angle branching are characteristic of this fungus (Papanicolaou stain) suggesting *Mucor Spp*.



PANEL 1b: Upper gastrointestinal endoscopic image showing large deep ulcers with necrotic tissue extending from fundus.



DISCUSSION

Gastric mucormycosis is a rare but serious infection that typically affects immunocompromised individuals. It is a form of mucormycosis, an opportunistic fungal infection caused by fungi of the *Mucoraceae* family, commonly *Rhizopus* spp., *Mucor* spp., and *Cunninghamella* spp. The infection most often occurs in patients with underlying conditions such as uncontrolled diabetes mellitus, hematologic malignancies, organ transplant recipients, and those undergoing immunosuppressive therapy (John et al., 2019) [1]. In our case, the patient's history of severe COVID-19 infection, treated with high-dose steroids and other immunosuppressive medications (bevacizumab and remdesivir), created an immunocompromised state, making him more susceptible to fungal infections, including gastric mucormycosis. The patient presented with symptoms including black tarry stools (melena), abdominal pain, and generalized paleness of skin, which are indicative of gastrointestinal bleeding.

The initial laboratory investigations revealed a low hemoglobin level (5.6 g/dL) and elevated inflammatory markers, including a significantly raised C-reactive protein (58 mg/L), consistent with an ongoing infection or inflammatory process. Ultrasound findings of multiple hypoechoic lesions in the liver raised concern for metastatic or localized fungal involvement. The patient's presentation, with symptoms of upper gastrointestinal bleeding and a history of recent steroid use, strongly suggested a diagnosis of peptic ulcer, with secondary infection by *Mucor* spp., as further confirmed by upper gastrointestinal endoscopy and biopsy (Panel 1a and 1b).

The endoscopic findings revealed a large excavating ulcer from the fundus to the upper antrum, consistent with gastric mucormycosis, a known complication of steroid use and immunosuppression (Patel et al., 2021) [2]. The biopsy was avoided due to the risk of perforation, and an aspirate was collected instead, which later grew *Mucor* spp. This is in line with the typical pathogenesis of mucormycosis, where the fungus invades tissues, often leading to necrosis and blood vessel destruction. The gastrointestinal tract is a less common site of involvement for mucormycosis, but when it occurs, it often results in severe complications, including gastrointestinal bleeding (Chakrabarti et al., 2021) [3]. The management of gastric mucormycosis is challenging and requires early recognition. In our case, the patient was started on intravenous liposomal amphotericin B, followed by a transition to posaconazole, which is commonly used for mucormycosis due to its broad-spectrum antifungal activity (Sobel, 2009) [4]. Although surgery such as total gastrectomy is a potential treatment option, it is associated with high morbidity and was deemed inappropriate for this patient, given the severity of the disease and the patient's overall clinical condition. Instead, a conservative approach was adopted, leading to significant improvement during the three-month follow-up, with a marked reduction in the size of hepatic lesions.

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