

# Gastric mucormycosis: An unusual transplant infection

Suman Sethi<sup>1</sup>, Nitin Sethi<sup>2</sup>, Sandhu J S<sup>1</sup>, Simran Kaur<sup>1</sup>, Vikas Makkar<sup>1</sup>, Sohal P M<sup>1</sup>

<sup>1</sup>Department of Nephrology, Dayanand Medical College and Hospital, Ludhiana, Punjab, India, <sup>2</sup>Fortis Hospital, Ludhiana, Punjab, India

Correspondence to: Suman Sethi, E-mail: suminitin@gmail.com

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## ABSTRACT

Invasive gastric mucormycosis is a rare and fatal disease. We report a rare case with longstanding renal transplant who presented with hematemesis. Upper GI endoscopy was performed which showed large ulcer involving antrum and distal body of stomach. Histologic examination showed invasive mucormycosis. This is a rare case of invasive gastric mucormycosis localized exclusively in the stomach.

**KEY WORDS:** Stomach; Mucormycosis; Immunocompromised Patients; Gastric Ulceration; Renal Transplant

## INTRODUCTION

Mucormycosis, an infection caused by fungi of the class zygomycetes, order mucorales, is usually found in immunocompromised patients, with disease manifestations differing for each of the underlying condition. The rhinocerebral form can be found most often in diabetic patients,<sup>[1]</sup> the pulmonary and disseminated manifestations are in association with hematological malignancies<sup>[2,3]</sup> and the gastrointestinal form of the disease is primarily found in patients suffering from extreme malnutrition. Mucormycosis has also been recognized in patients requiring hemodialysis,<sup>[4]</sup> and in immunosuppressed patients following organ transplantation.<sup>[5]</sup>

Gastric mucormycosis is a rare disease with a reported fatal outcome of 98%.<sup>[6]</sup> Manifestations range from colonization of peptic ulcer to infiltrative disease with vascular invasion and dissemination.<sup>[7]</sup>

## CASE REPORT


A 58-year-old male underwent live unrelated kidney transplantation in December 2012. He had developed end-stage renal disease as a result of diabetic nephropathy and had commenced maintenance hemodialysis 12 months earlier. He was on triple immunosuppressive drugs included steroids, tacrolimus and MMF. He presented with massive amount of blood in vomitus. His CMV status was negative. Hepatitis B and hepatitis C were negative. His Tac level was 10.

His ultrasound whole abdomen was done which showed fatty liver no evidence of ascites was there. Upper GI endoscopy was performed which showed large ulcer involving antrum and distal body of stomach.

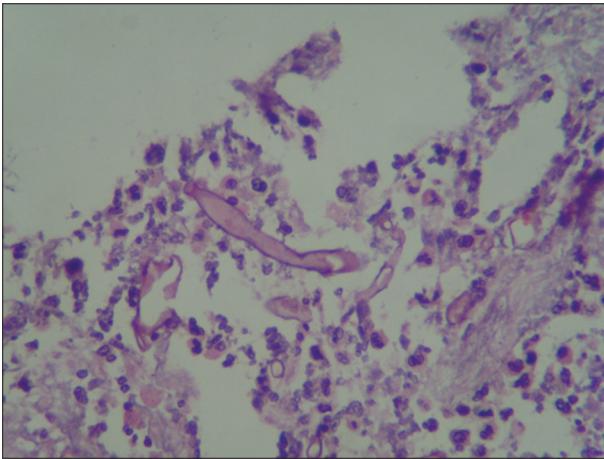
Histological examination of gastric biopsy showed areas of ulceration and necrosis with inflammatory granulation, within areas of necrosis are seen many broad aseptate fungal hyphae of mucor (Figure 1). Helicobacter pylori and other microorganisms were absent.

Since a fungal etiology of the gastric ulcer was established, daily intravenous.

Treatment with amphotericin B at 1 mg/kg of body weight was initiated. The serum creatinine level increased to a

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**Figure 1:** Histological examination of gastric biopsy showed areas of ulceration and necrosis with inflammatory granulation, within areas of necrosis are seen many broad aseptate fungal hyphae of mucor

maximum of 4.4 mg/dl after 15 days of antifungal therapy nevertheless, daily administration of the full dose was continued for an additional 3 weeks until a total dose of 1,850 mg of amphotericin B was given.

After the withdrawal of amphotericin B therapy, the serum creatinine level decreased rapidly to a stable value of 1.8 mg/dl. Repeated gastroscopic follow-up examinations confirmed complete healing of the ulcer.

## DISCUSSION

*Zygomycetes* are ubiquitous fungi, often present in soil and decaying organic material. Despite their widespread distribution, disease manifestations are generally restricted to severely immunocompromised patients, attesting to the low intrinsic virulence potential of these organisms.<sup>[8]</sup> The most common infections caused by *Zygomycetes* include those caused by members of the four genera *Rhizopus*, *Rhizomucor*, *Absidia*, and *Mucor*, with *Rhizopus oryzae* being the species most frequently isolated from patients,<sup>[9]</sup> whereas *Rhizopus stolonifer* has never been implicated in a human infection. Gastrointestinal infection is thought to arise from the ingestion of spores and has been traditionally linked to extreme malnutrition.<sup>[2,7]</sup> In nontransplant recipients the stomach was the most frequently involved site, with 67% of all manifestations being gastrointestinal and with a reported mortality rate of 98%.<sup>[8]</sup>

Histologically, invasion of vessel walls producing thrombosis, hemorrhage, necrosis, and ulceration of the tissue with an almost uniformly fatal outcome has been separated from colonization of ulcer disease, with a more favorable prognosis.<sup>[6]</sup>

More recently, an additional category of invasive disease with infiltration of viable tissue but without vascular involvement has been proposed, but it still represents severe disease.<sup>[10]</sup>

After a review of the literature, we found that species identification of the fungi by culture has been completed only for a minority of patients. Isolation of *R. oryzae* has been reported only once, from a perforated stomach wall of an infant (32 weeks of gestation) with respiratory distress syndrome, sepsis, and a nasogastric tube.<sup>[11]</sup>

Several risk factors might have favored this rare infection in our patient. Uremia implies alterations in the immune system, with granulocyte dysfunction and depressed cell-mediated immunity.<sup>[12]</sup> Normal human serum inhibits the growth of *Rhizopus* spp.,<sup>[3]</sup> while the sera of uremic patients decrease the inhibitory effects of macrophages on spore germination.<sup>[5]</sup> Furthermore, metabolic acidosis, another feature of uremia, increases the availability of iron, which is a known growth factor for *Rhizopus* spp. Antirejection therapy with high doses of corticosteroids could have exerted an additional important risk factor.

Therapy of mucormycosis with amphotericin B remains standard. Currently applied azole derivatives do not appear to be effective,<sup>[13]</sup> despite a single report of a cure of invasive gastrointestinal mucormycosis in a patient with AIDS achieved with ketoconazole.<sup>[1]</sup> Surgical intervention was also considered for our patient. However, the stable clinical condition, an early causative diagnosis and treatment, as well as frequent gastroscopic follow-up examinations justified an attempt for conservative management.

## CONCLUSION

This is a rare case of invasive gastric mucormycosis localized exclusively in the stomach. The stable clinical condition, an early causative diagnosis and treatment, as well as frequent gastroscopic follow-up examinations justified an attempt for conservative management.

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