GASTRIC MUCORMYCOSIS MIMICKING GASTRIC CARCINOMA IN A 51-YEAR-OLD MALE: A CASE REPORT FROM A TERTIARY CARE HOSPITAL

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ABSTRACT

Mucormycosis is a rare opportunistic fungal infection which is usually diagnosed in immunocompromised individuals. Here we are reporting a 51 years male patient who was a known diabetic with chronic renal failure, presented with gastric bleeding and was clinically suspected as a case of Gastric Carcinoma. He underwent endoscopy for gastric mucosal biopsy and histopathological evaluation was done. Microscopic examination of the sections revealed partially ulcerated gastric mucosa which has dense mixed inflammation in the lamina propria. There were multiple areas of necrosis and many variable sized fungal hyphae showing branching at right angles. The histopathological diagnosis of Mucormycosis was made.

Keywords: Mucormycosis, Immunocompromised, Gastric carcinoma

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INTRODUCTION

Mucormycosis is an aggressive fungal infection which is more commonly seen in immunocompromised hospital admitted patients. It is usually caused by bread mold fungi, which include Mucor, Rhizopus, Lichtheimia, and Cunninghamella, all of these from the family Mucormycetes.[1,2] The factors which predispose to the development of this condition are diabetes mellitus, neutropenia, iron overload, corticosteroid use, and ulcerations in the lining epithelium.[2,3] The availability of free iron promotes the growth of Mucormycotina, thereby increasing the chances of dissemination of infection. There is increased free iron in diabetics due to ketoacidosis and/ or HbA1C induced poor affinity for iron and also in patients who are on chronic iron chelation treatment where deferoxamine within the fungi acts as a siderophore.[4] Cases of gastrointestinal mucormycosis are also seen in association with autoimmune conditions like Auto Immune Deficiency Syndrome, Systemic lupus erythematosus, and also in organ transplant recipients.[2]

Depending on whether the spores are inhaled or ingested, the sites which are most commonly involved includes nasal sinuses, lungs, and gastrointestinal tract. Primary gastric involvement is a rare presentation. The most common affected organ in gastrointestinal mucormycosis is stomach (67%), followed by other sires which includes, the colon (21%), small intestine (4%), and esophagus (2%).[4-6] The mode of entry of the organisms into the gastrointestinal tract is possibly through ingestion of spore in fermented milk, bread and other bakery products and fermented food beverages; infected corn being the primary mode.[7]

Mucormycetes form nonseptate hyphae of variable width (6-50 µm) with frequent right angle branching. The Mucormycotina cause local tissue necrosis and have tendency to invade blood vessels resulting in disseminated disease.[2,4,5]

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Case Presentation:

We received endoscopic gastric mucosal biopsy of a 51 years old male admitted in Medical unit of university of Lahore teaching hospital, with history of two episodes of hematemesis for one day. He was a known diabetic and patient of chronic kidney disease for the last 5 years. There was no history of any viral hepatitis or chronic liver disease. Examination was unremarkable and all the baseline investigations were normal. MRI revealed thickening of gastric wall but no mass lesion was identified. Gastric endoscopy was planned and ulcerated area with grey white slough was seen in stomach on endoscopy which lead to the clinical diagnosis of Gastric Carcinoma. Gastric biopsy was taken and sent to histopathology for Microscopic examination. Gastric biopsy revealed partial ulceration of gastric mucosa along with severe mixed inflammation, areas of necrosis and many variable sized fungal hyphae showing branching at right angles. The multiple levels of the tissue section were examined. The gastric mucosa was lined by benign columnar epithelium and there was no dysplasia or malignancy in the biopsy tissue. The diagnosis made on histopathological examination of gastric endoscopic biopsy was Gastric Mucormycosis.

1A **1B**

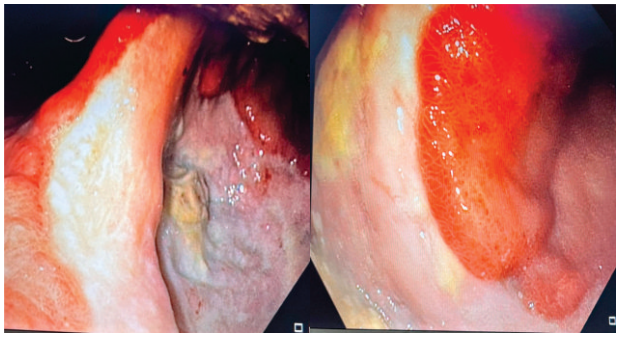

Figure 1A: *Endoscopic view showing erythematous ulcer with adjacent yellowish white slough, covering the gastric mucosa.*

Figure 1B: *Endoscopic view of Gastric mucosa showing intensely erythematous ulcer.*

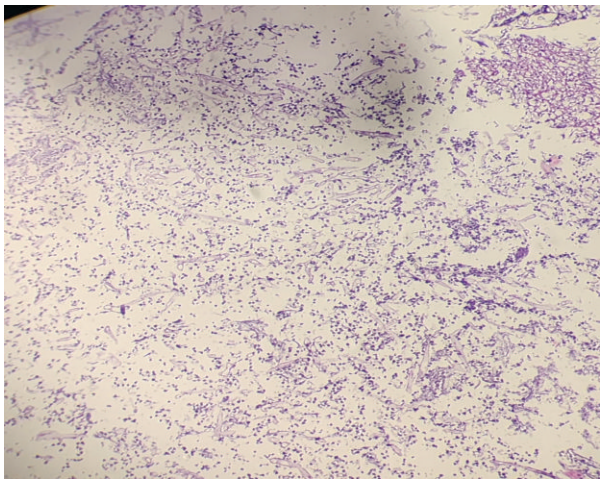

Figure 2: *H&E x 10, endoscopic gastric biopsy showing inflammatory infiltrate rich in neutrophils and many nonseptate or sparsely septate fungal hyphae and spores*

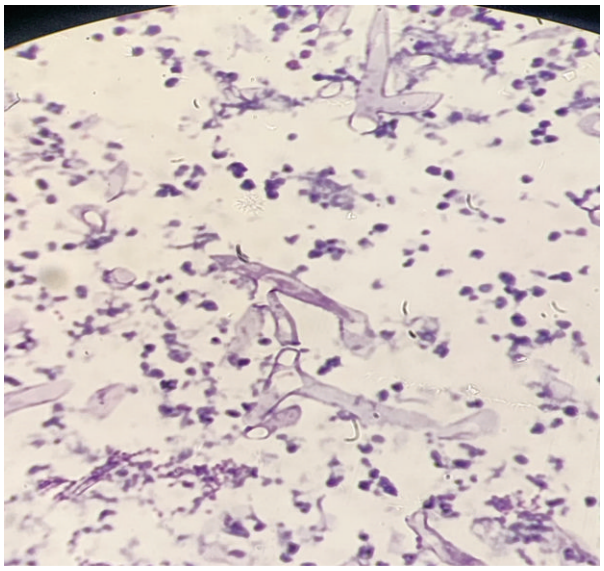

Figure 3: *H&E at 40 x broad, aseptate fungal hyphae showing right-angle branching.*

DISCUSSION

The mucormycosis is an Angio-invasive fungal infection. Immunocompromised patients particularly of diabetes mellitus have increased risk of mucormycosis infection because the fungal growth is favored in the hyperglycemic and acidotic state. There are multiple clinical presentations of mucormycosis such as rhinocerebral, pulmonary, gastrointestinal, cutaneous and disseminated. The clinical forms where vascular invasion is more common are rhinocerebral and pulmonary.

Gastrointestinal mucormycosis is one of the rare presentations, occur in less than 7% of all cases. The commonly involved organ in gastrointestinal tract is stomach and the next in frequency are colon, small intestine and rectum.[2,8] The route of entry into stomach is via ingestion of moldy bread or contaminated food. The use of contaminated tongue depressors have also been implicated in gastric mucormycosis.[2,7]

Only about 25% of gastrointestinal mucormycosis can be diagnosed in the alive patients posing diagnostic challenges both for the clinicians and the pathologist.[2] There are different modalities to diagnose mucormycosis including, routine blood workup, tissue biopsy, culture, and radiological studies.[9,10] On computed tomography there is thickening of the wall along with lack of enhancement and mucosal defects mimicking bowel ischemia.[2,8] Site specific techniques are used according to anatomical manifestations of the disease. Investigating gastrointestinal mucormycosis requires endoscopic procedures.[11] Endoscopic biopsy improves the histologic diagnostic sensitivity up to 80% whereas in culture no growth is seen in more than 50% of cases.[2,3,12] Endoscopic biopsies demonstrate characteristic fungal hyphae and necrotic lesion. Sections prepared from tissue biopsy specimen are stained with hematoxylin and eosin stains. In surgical resection specimens, the characteristic fungal granulomatous inflammation may not be seen in immunosuppressed individuals and culture are utilized to diagnose Mucormycosis species.[2,12] Molecular studies including DNA sequencing, polymerase chain reaction (PCR) and also restriction fragment length polymorphism (RFLP) are also utilized to diagnose Mucormycosis.[13]

The confirmed diagnosis of mucormycosis is made on microscopic examination by identification of the characteristic fungal hyphae on histopathology of tissue sections. The hyphae of mucorales are broad and irregular in shape measuring 5–20 μm in diameter, have rare septations and branching at right angle.[14] The angio-invasive fungal disease leads to thrombosis and tissue infarction by causing necrotizing vasculitis.[2,5,15]

The timely diagnosis of mucormycosis on histopathology of the tissue biopsy and treatment with intravenous antifungal medicine and surgical tissue debridement can save the patients.[2]

CONCLUSIONS

Mucormycosis is an angio-invasive and highly fatal and fungal infection in immunocompromised patients. In patients having risk factors and gastrointestinal complaints, mucormycosis should always be included in the differential diagnosis. Early histologic diagnosis of gastrointestinal mucormycosis and treatment is critical as the progression of the disease is very rapid and have high mortality rate.

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AUTHOR'S CONTRIBUTION

Conceptualization and study design	RA, SS, SAJ
Data Acquisition	RA, SS, AI, TN
Data Analysis/ interpretation	RA, SS, SAJ, SA
Manuscript drafting	RA, SS, AI, SA,
Manuscript review	RA, SS, SA, TN

All authors read and approved the final draft.

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