## Case Reports

# Invasive mucormycosis in benign gastric ulcer

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## ABSTRACT

Fungal elements are frequently noted overlying the base of chronic peptic ulcers of the stomach and it has been suggested that the fungi enhance the degree of necrosis and that these cases have protracted disease and deeper ulcers with more perforations. It has also been postulated that the number of fungal elements might be increased in the stomach of patients who are receiving potent medications such as H2-receptor antagonists to reduce gastric acidity, but there have not been adequate control studies, and the deleterious effects from the presence of the fungi in these cases have not been substantiated. We present a very rare case of invasive mucormycosis (phycomycosis) occurring in the base of a chronic gastric ulcer in a 55 years old diabetic male. This case was clinically and radiologically been mistaken for a gastric carcinoma. In addition, the ulcer was complicated by perforation and fungal septicemia with subsequent fatal outcome. The clinical, radiological and histopathological features are described together with a literature review of other reported fungal gastric ulcers.

**Keywords:** Mucormycosis, stomach, fungal ulcer.

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Invasive gastric mucormycosis is an uncommon disorder which is very rarely reported in the literature. The disease is usually seen in chronically ill, debilitated and immunosuppressed patients. The clinical presentation and radiological features can mimick infiltrative malignancies like non-Hodgkins lymphomas and poorly differentiated carcinomas.

In this report, we describe the clinical, radiological and histopathological features of mucormycosis in a diabetic patient with non-healing gastric ulcer which is infected by the mucor fungal elements. The patient was also intermittently treated by H2 receptor antagonists.

**Case Report.** A 55 year old diabetic Saudi male was admitted through our surgical outpatient department with a one month history of epigastric abdominal pain, decrease in appetite and weight loss (about 4.5 kg). The patient's diabetes was controlled with oral hypoglycemic drugs but there was a history of poor compliance. Clinical examination at the time of admission showed no significant signs apart from mild tenderness in the epigastric region.

Furthermore, there were no important biochemical or hematological findings apart from mild iron deficiency anemia and the clinical impression at this stage was of gastric carcinoma.

A Barium meal examination showed prominent mucosal folds mainly in the gastric fundus.

Abdominal ultrasonography and CT scan revealed marked thickening of the stomach wall (Figure 1A and B) with a single small hypodense area 1.7 cm in diameter in the right hepatic lobe. This lesion was interpreted radiologically as a possible hemangioma,

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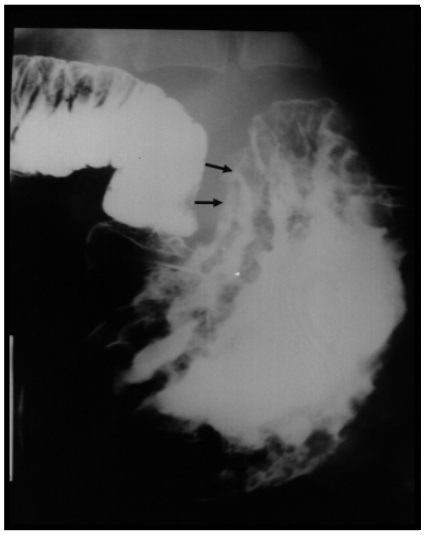

**Figure 1a -** Barium meal radiographic picture showing markedly thickened and irregular gastric mucosal folds (arrows).

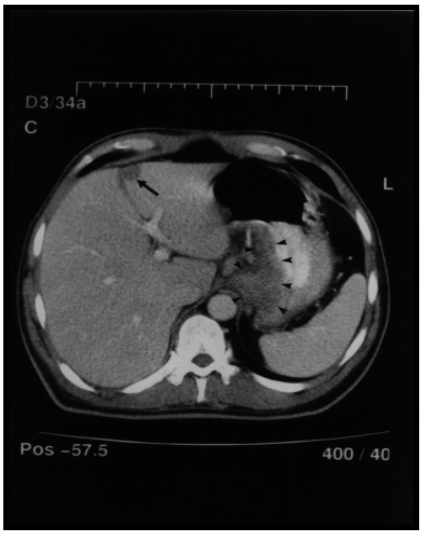


**Figure 1b -** Abdominal computed tomograhic picture showing localized gastric wall thickening involving the fundus and the lesser curvature (arrow heads). A tiny hypodense lesion (1.7cm diam) is present on the anterior subcapsular area of the left liver lobe (arrow).

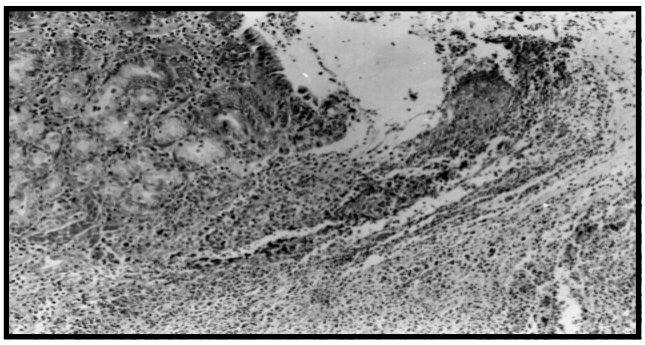

**Figure 2a -** Benign gastric ulcer showing a necrotic and inflammatory base. H/E stain x 100.

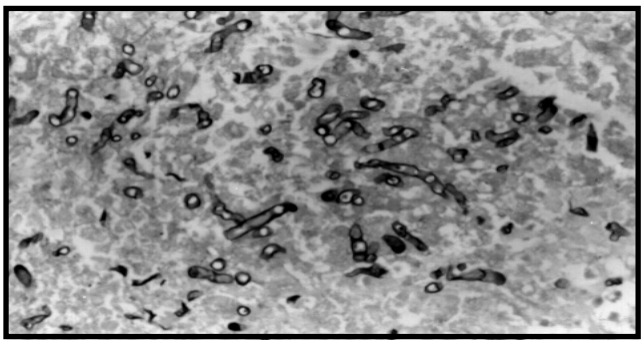

**Figure 2b -** A palissading granuloma consisting of a layer of histiocytes surrounding a necrotic centre containing fungal elements (not depicted). H/E stain x 200.

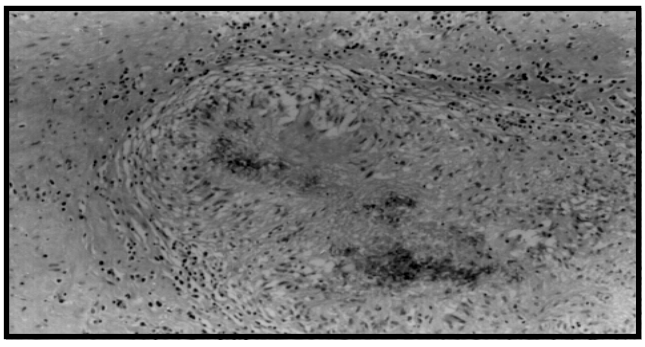

**Figure 2c -** Fungal elements consistent with mucormycosis are seen in a background of necrotic acute inflammatory exudate. Note the broad and non-septated hyphae with minimal branching. Methenamine silver stain x 400.

although metastatic deposit could not be excluded.

Endoscopic examination showed a large ulcer occupying most of the gastric fundus with surrounding friable mucosa. The mucosal wall of the gastric antrum was thickened but with no ulceration. The oesophagus and duodenum were normal.

Histological examination of the endoscopic gastric biopsies showed acute ulceration, helicobacter pylori associated chronic active gastritis and intestinal metaplasia with no evidence of lymphomatous or carcinomatous infiltration.

The patient was subsequently treated with anti-ulcer drugs including H2 antagonist for a period of 14 days but showed no response and a decision to perform laparotomy with possible partial gastrectomy was taken because of the strong clinical and radiological suspicion of malignancy, in addition to the worsening of the patients symptoms.

At operation, a large perforated gastric ulcer was seen in the anterior gastric wall with surrounding marked adhesions. A partial gastrectomy was performed and sent for histopathological assessment. The patient died, however, on the tenth post-operative day because of fungal septicemia and a permission for autopsy was not granted.

***Gross and histopathological findings.*** The specimen received in the histopathology laboratory consisted of a partial gastrectomy specimen measuring 16 x 14 x 6 cm. The lesser gastric curve was markedly distorted, thickened and contained a large perforated ulcer approximately 6 cm in maximum diameter. The ulcer showed irregular edges and a markedly thickened and fibrotic wall (3 cm in thickness in some places). The surrounding mucosa was markedly congested and granular with prominent rugae.

A few enlarged peri-gastric lymph nodes up to 1 cm in diameter were noted and dissected.

Hematoxylin and eosin stained histological sections showed a benign and chronic gastric ulcer containing several micro-abscesses with surrounding extensive reactive fibrosis in its wall. Many epithelioid and giant cell granulomata were also identified (Figures 2A-B).

Special stains for fungi which included periodic acid schiff (PAS) and methenamine silver (Grocott) stains showed numerous fungal elements at the centre of the described micro-abscesses and granulomas. The fungal structures consisted of many broad and branching hyphae and were morphologically in keeping with mucormycosis. (Figure 2C). This was later confirmed by fungal culture. Scanty similar fungal elements associated with granulomatous reaction were also identified in some of the enlarged peri-gastric lymph nodes. The liver contained several micro-abscesses similar to the one seen at the base of the gastric ulcer.

**Discussion.** Invasive mucormycosis of the stomach is an uncommon disorder which is very rarely diagnosed ante-mortem. It is due to the Mucor agents, which are part of the mucoraceae family, in the phycometes class. Gastric infection is rarely seen in severely debilitated or immuno-compromised patients and appears to be more prevalent in tropical regions.[1,2] The lesions can affect any part of the stomach and usually show extensive hemorrhage, necrosis and thrombosed vessels. They may also extend deep into the gastric wall, resulting in perforation.[3] The inflammatory reaction is non-specific and usually lacks granulomas[4] and the specific diagnosis is provided by the identification of the fungi. Our literature search revealed that the prevalence of fungal gastric ulcers varies between 5% to 36%.[5,6]

Nichols and Henry[7] found a rise in the prevalence of gastric ulcers with fungus of 19% in the early fifties to 37% in the early seventies, and suggested that this might be due to the use of H2 receptor-blocking drugs that, by lowering the gastric PH, would facilitate the growth of fungi.

Eras et al[8] found that 98% of the patients reported in his series to have fungal gastritis had also associated malignancy while Loffeld et al[9] reported only a 6% incidence of malignancy in cases of a gastric ulcers with fungi. In 1984, Antonioli et al[10] showed that the gastric ulcers with fungi appeared malignant at endoscopic inspection in a significantly higher percentage than non-fungal ulcers.

These results are supported by our findings in this case of ulcerated gastric mucormycosis which showed malignant endoscopic appearances in a very large fundic ulcer. Our case does, however differ from those reported in the medical literature in that the fungal infection was invasive rather than superficial in nature,[3,9,10] that it has caused granulomatous reaction unlike other reported cases[4] and that it was seen in a diabetic patient who has been intermittently treated by H2 receptor antagonists but with poor compliance.[7]

In conclusion, the message that should be conveyed from this case is that in diabetic patients presenting with non-healing gastric ulcers which are showing appearances suspicious of malignancy by both endoscopic and imaging techniques, the possibility of a rare fungal infection should be considered and thoroughly investigated. Both clinicians and radiologists should be aware that fungal contamination may have clinical significance especially if the infection is invasive and caused by phycomycosis in diabetic patients receiving H2 receptor antagonists. Whether addition of antimycotic treatment will improve, healing and post-operative survival remains to be established by prospective trials.

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