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A Prospective Study of Gastric Perforation Due To Fungal Infection in RIMS, Ranchi, Jharkhand

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Abstract: *Gastric ulcer perforation with peritonitis is a common presenting complaint of surgical emergency. The presence of fungal micro-organisms (Candida albicans) in peptic perforations is rare and carries grave prognosis. This was a prospective study of patients admitted to the Department of General Surgery, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India with a diagnosis of gastric perforation between October 2015 to September 2017. 47 patients included in the study. 5 cases of gastric perforation were found to be due to Candida albicans on histopathological examination of tissue taken from edge of the ulcer. Out of 5 cases, 4 were male and 1 female, 3 belongs to elderly age group (above 60 years). Most cases showed associated co-morbidities like diabetes mellitus and tuberculosis. Out of 5 cases, 3 cases died i.e. mortality was 60%.*

Keywords: *Gastric perforation, Candida albicans, immunocompromised, mortality*.

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I. Introduction

One of the most common presenting complaints of surgical emergency is the peptic ulcer perforation with peritonitis. Most of the peptic ulcer perforations are due to non-steroidal anti inflammatory drug abuse and alcohol abuse. The presence of fungal micro-organisms in peptic perforations is rare. *Candida albicans* is an opportunistic fungus which is present as a normal commensal in gastrointestinal tract. The pH of the gastrointestinal tract is low hence infection due to Candida is rare, however long term use of antacids, Candida infection can be found in gastric ulcers of healthy individuals. Candida infection is seen mostly in patients who are immunocompromised, or are having diabetes mellitus, in patients with long term use of steroids or NSAID's.[1] Gastric perforations due to *Candida albicans* is a very rare phenomenon, mostly seen in debilitated and immunocompromised patients. Here we are reporting 5 cases of gastric perforation due to *Candida albicans* diagnosed on the basis of histopathological examination of tissue taken from edge of the ulcer.

II. Aim And Objective

To evaluate the incidence and etiopathogenisis of fungal infection (*Candida albicans*) in gastric perforation.

III. Material And Methods

This observational study was conducted in the Department of Surgery, Rajendra Institute of Medical Sciences, Ranchi from October 2015 to September 2017. After taking written consent from patients, 47 patients of gastric perforation were included in this study. Prior clearance from Institutional Ethics Committee was also obtained. Patients presenting with spontaneous gastric perforation were included. Those patients with gastric perforations due to trauma were excluded from this study. A detailed clinical history was taken with pre defined proforma. Relevant investigations were done. Patients were subjected to exploratory laparotomy. Site of gastric perforation was determined. Tissue biopsy was taken from the site of perforation and was sent for histopathological examination. The peritoneal fluid was sent for culture and sensitivity. Perforations were repaired by modified Graham's patch repair. On the basis of HPE and culture & sensitivity reports, 5 patients were found to have gastric perforation due to fungal infection by *Candida albicans*.

IV. Results

47 cases of gastric perforation were studied of which 5 cases were due to *Candida albicans*. Other out of 43 cases of gastric perforation, 4 were due to adenocarcinoma which was diagnosed on histopathological examination and rest 38 cases were due to acute inflammatory lesions. All the 5 patients of fungal gastric perforation presented with shock, severe dehydration, abdominal distension, tenderness and absolute constipation for 1-2 days. The following observations were made:

Table No. 1 shows 5 patients had fungal gastric perforation. The Incidence of gastric perforation due to *Candida albicans* was 10.64%

Table 1: Incidence of fungal gastric perforation (*Candida albicans*)

Total no. of gastric perforations	Total no. of fungal gastric perforation	Percentage
47	5	10.64

Table No. 2 shows various age groups for fungal gastric perforation. Most of the patients were elderly. The youngest patient was an 11 years old boy suffering from active pulmonary tuberculosis. The eldest patient was 76 years male with uncontrolled diabetes mellitus for last 3 years.

Table 2: Age group for fungal gastric perforation

Age (in years)	No. of fungal gastric perforation (n=5)
0 - 10	0
11 - 20	1
21 - 30	0
31 - 40	0
41 - 50	1
51 - 60	0
61 - 70	2
71 - 80	1

Table No. 3 shows distribution of patients according to sex. Out of 5 patients 4 were male and 1 was female. Male to female ratio was 4:1.

Table 3: Sex wise distribution of patients

Sex	Total no. of fungal gastric perforation (n=5)
Male	4
Female	1

Table No. 4 shows associate co-morbid conditions which were either single or more than one among fungal gastric perforation patients. One patient had history of peptic ulcer disease, two had diabetes mellitus, one had pulmonary tuberculosis and one had more than one co-morbid conditions.

Table 4: Associated co-morbidity

Co-morbid condition	No. of fungal gastric perforation (n=5)
Peptic ulcer	1
Diabetes mellitus	2
Tuberculosis	1
Hypertension	0
AIDS	0
Cancer	0
More than one conditions	1
Asymptomatic/no history	0

Table No. 5 shows drug history of patients of fungal gastric perforation. One patient had long history of intake of antacids (pantoperazole). He had been taking the drug regularly for past 4 years. Patient with active tuberculosis was on anti-tubercular drug for last 20 days.

Table 5: Drug history

Drug history	No. of fungal gastric perforation (n=5)
Antacids	1
Steroids	0
Antitubercular	1
NSAID'S	0
No history of drug intake	0

Table No. 6 shows mortality of fungal gastric ulcer patients. 3 patients died between post operative day 3 and day 7. Two died due to septicemic shock, one died due to acute renal failure. Two of the patients were discharged on post-operative day 10. All were given fluconazole.

Table 6: Mortality

Post operative Outcome	No. of fungal gastric perforation (n=5)
Alive	2
Death	3

Histopathological examination of tissue taken from the ulcer edge showed fungal elements (hyphae). Positive staining of pseudohyphae with periodic acid Schiff's suggested *Candida albicans.* The culture of peritoneal fluid in Sabouraud dextrose agar media showed *Candida albicans.*

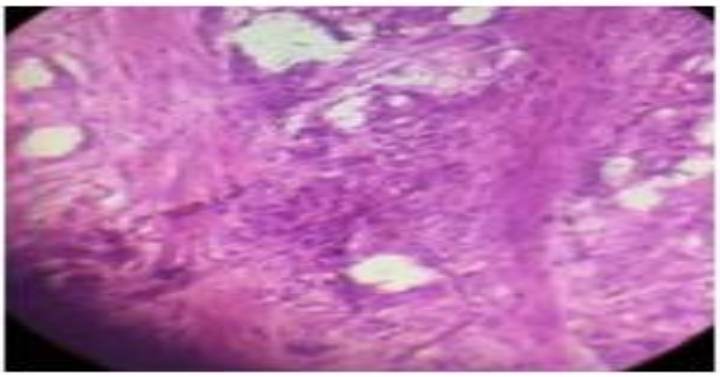

Figure 1: HPE showing fungal hyphae of *Candida albicans*

V. Discussion

The gastrointestinal flora consist normally of anaerobic and Gram negative bacteria. Candida species are also the normal commensals of the gastrointestinal flora. In some conditions the Candida species can heavily colonise the gastrointestinal tract[10]. Predisposing factors for this are immune-deficiency conditions and prolonged use of antibiotics[11]. In our study, most of the patients were elderly with associated immuo-compromised co-morbidities like diabetes mellitus, tuberculosis and extreme of ages. One of the patients had a long history of antacid use. The overgrowth of fungus is increased at a certain pH (5-6) and with presence of glucose[6,7]. The use of antacids for prolonged duration and uncontrolled diabetes mellitus are risk factors for fungal overgrowth[8.] The incidence of *Candida albicans* causing gastric perforation peritonitis in our study was 10.64%. The overall incidence of fungal peritonitis ranges between 3-12% [2,3]. Earl P, et al (1972) reported 4.35% of candidal infection in gastric perforation[4]. Tsukamoto H, et al (1986) reported 5.9% incidence of candidal infection as a cause of gastric perforation[5]. The prognosis of *Candida* perforation is poor and mortality rates are high between 52%-75%[9]. The mortality rate of our study was 60%.

VI. Conclusion

In our study, the incidence of gastric perforation due to *Candida albicans* was 10.64% and it was mainly found in elderly as well as young age groups. In any case of gastric perforation peritonitis, the fungal (*Candida albicans*) cause should always be considered especially in patients presenting in extreme of ages, with immune-deficiency conditions such as diabetes, tuberculosis. Fungal culture for gastric perforation should be considered along with histopathological examination of tissue from perforation edge. Since the prognosis of fungal perforation is poor, early and correct detection is important to treat the Candida infection.

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