

Case Report

Gastric perforation caused by Candida infection : Report of a case

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An 89-year-old female was admitted to our hospital because of fever and abdominal pain. The patient had used an antihypertensive agent, but had not used either antibiotics, steroids, or potent antacids. An abdominal CT scan revealed free air and ascites. An emergency operation was performed for acute peritonitis caused by a gastrointestinal perforation. A perforated ulcer was observed at the posterior wall of the gastric body. A distal gastrectomy with intraperitoneal drainage and a Billroth II reconstruction was performed. A histological examination demonstrated a perforated ulcer surrounded by Candida infection. The patient developed an abscess in the abdominal cavity, but was discharged on the 52nd postoperative day. Although gastrointestinal Candida infection is commonly seen in immunocompromised host with diabetics or malignant diseases, habitual use of strong antacids can also cause severe Candida infection of the stomach in healthy persons. In this case, it was thus concluded that there may have been a decrease in immunity in this patient because of her advanced age 89 years old and malnutrition.

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Introduction

Candida is an ubiquitous fungus present healthy individual. It rarely is pathogenic. Candida infection generally develop in immunocompromised hosts with malignant tumors, diabetes and who have been on long-term steroids or other immunosuppressants. Recently, it was also reported that Candida can infect gastric ulcers following the long-term use of a potent antacids^{1,2}. We herein report our experience with a case of perforative peritonitis associated with a rare Candida infectious gastric ulcer, The patient did not possess any other underlying disease and had not been taking any medication, excluding antihypertensive agents. In this report, we also discuss the pathogenesis of Candida in-

fection in the gut.

Case Report

An 89-year-old-female patient consulted our hospital of a high fever and abdominal pain. At the time of the her admission, she was 145 cm tall, weighted 38 kg, and BMI 18.1 kg/m². Her blood pressure was 182/89 mmHg with a heart rate of 110 beats/min, a body temperature of 38.5 °C, and SpO₂ of 98% on room air. A physical examination revealed slight anemia on conjunctival examination, marked abdominal tenderness, and peritoneal irritation. Laboratory tests revealed a WBC count of 21,100 cells/m³, a hemoglo-

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bin level of 8.7g/dl, a platelet level of 42.9×10^4 cells/ m^3 , an albumin level of 2.9 g/dl, a BUN level of 77.7mg/dl, a creatinine level of 2.61mg/dl, and a CRP level of 51.12mg/dl. Her transaminase was normal. In the coagulation test, the prothrombin time level was 64.2 % (INR: 1.29). The tumor markers were within normal range with a CEA of 2.0ng/dl and CA19-9 of 4.0U/ml. In the blood gas test, slight alkalosis with a pH of 7.481, a PaO_2 of 64.6Torr, a $PaCO_2$ of 26.6Torr, a HCO_3^- of 19.6, and a BE of -3.3 was observed. An abdominal X-ray showed free air and an abdominal CT scan revealed free air and massive ascites in the Douglas fossa (Fig. 1a-1b). Furthermore, an upper gastrointestinal series with water-soluble contrast media (gastrographin[®]) revealed leakage to the surroundings of the stomach. The patient was therefore diagnosed as having an upper gastrointestinal perforation, and underwent an emergency surgery. After entry the peritoneal cavity, a large amount of dirty ascites were found. During the surgical procedure, a perforation at the posterior wall of the gastric body was revealed. The size of the gastric perforative ulcer was 3cm in diameter (Fig. 2). A distal gastrectomy with intraperitoneal drainage and Billroth II reconstruction was performed. In the histological examination, malignant cells and *Helicobacter pylori* were not recognized around the part of perforation. The proliferation of yeast-like fungus was recognized from the mucosal membrane to the serous membrane at the perforation (Fig. 3a-3d). Moreover, the culture of ascites was

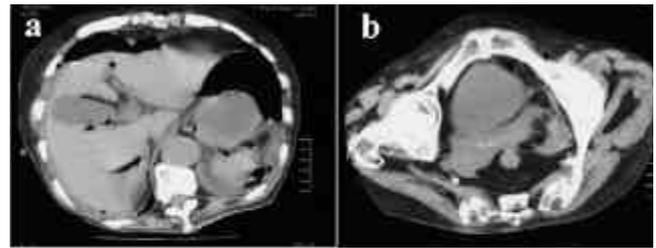


Figure 1. abdominal CT

1a: Abdominal CT scan revealed free air.

1b: Abdominal CT scan revealed massive ascites.

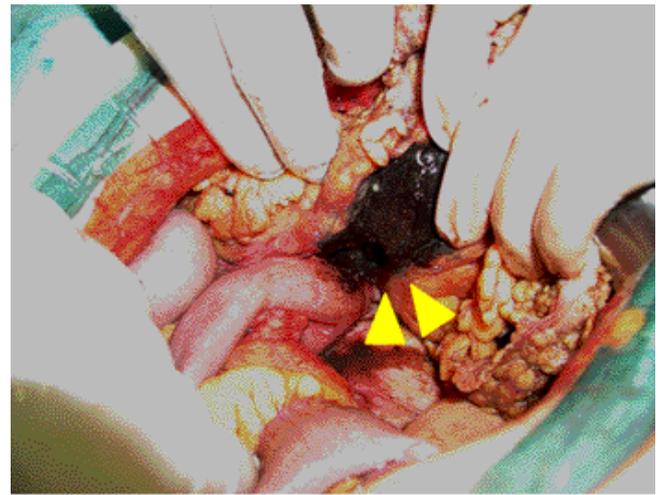


Figure 2. Surgical findings

The operation revealed a large amount of dirty ascites in the abdominal cavity and a perforation at the posterior wall of the gastric body.

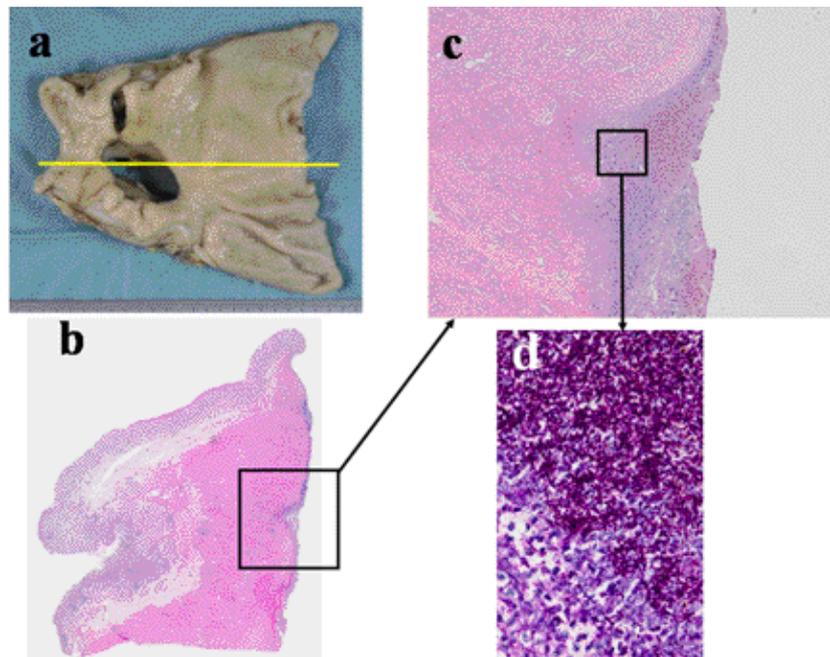


Figure 3. Macroscopic and Histological findings

At the part of gastric perforation ulcer, the proliferation of yeast-like fungus was shown.

(a: macrofindings, b: $\times 1$: HE, c: $\times 10$: HE, d: $\times 40$: HE)

submitted during surgical procedure, and the result was *C. albicans*.

As an intraperitoneal abscess arised, the drainage was inserted into the left upper quadrant under the echo guide on the tenth day after the operation. The drainage pus was submitted for a culture test. *C. albicans* was detected in the abscess. At the same time, we began to administer antifungal drugs (Diflucan[®]). Thereafter, the inflammatory reaction improved and the abscess cavity was reduced. The patient was discharged on the 52nd day after the operation. She has had no recurrence and is still doing well, as of this writing.

Discussion

Candida is an ubiquitous fungus present even in the gut of healthy individual. However, Candida is rarely pathogenic in the gut. *C. albicans* is the most frequently detected Candida species. Ears et al reported that gut mycosis was observed in 109 (4.3%) of 2517 total cases from 1960 to 1964³. In Japan, Tsukamoto et al reported that gut mycosis was present in 196 (5.9%) of 3,339 cases reported from 1971 to 1983, or which 186 cases (94.9%) were Candida species⁴. In these reports, the most commonly affected organ was the esophagus, followed by the stomach, the small intestine, and the large intestine^{3,4}. Minoli et al reported that stomach candidiasis was seen in 0.96% of upper gastrointestinal endoscopies⁵.

In the most cases, Candida develops as an opportunistic infection in immunocompromised. In the present case, the patient was an 89-year-old female, who had the Candida infection in her stomach, and no other underlying diseases. It is possible that she had decreased immune function simply due to her advanced age, hypoalbuminemia, and temporal renal dysfunction. In fact, a similar case was reported previously⁶.

Candida can become pathogenic, when it survives and proliferates in the gut. It is thought that the causative factor for the colonization is a decrease of the host immune defense due to the problems with the mucosa of the gut, a decrease in the normal intestinal flora, and an increase of the pH in the stomach due to the use of proton pump inhibitors or strong antacids. Some reports indicated that a pH of 5-6 in the stomach is suitable for Candida proliferation^{7,8}, although other reports have noted that Candida can also still proliferate at pH2⁹. Scotts et al reported that the disruption of the stomach mucous membrane by an ulcer was sufficient to cause stomach candidiasis¹⁰. On the other hand, Neison et al and Minoli et al reported that some cases of

idiopathic stomach candidiasis, in which there was no underlying disease, and without a history of medications was developed due to hypochlorhydric state^{11,12}. Kamiya et al. reported that Candida secondarily invaded and proliferated in the ulcer base in most cases¹³. It is difficult to determine whether gut candidiasis is idiopathic or secondary, largely because Candida species are part of the normal flora in healthy individuals. However, it has been suggested that Candida colonization can worsen ulcer^{14,15}. In this case, the renal function was worsened by temporal dehydration when she was hospitalized, although serum creatinine level was decreased gradually showed the decrease after surgery. However, the decrease in the renal function because of aged could be a risk factor of Candida infection.

Candidiasis is classified into three types: the festering type, the imitation film type, and the ulcer accompaniment type in macroscopic findings of gut candidiasis, and a lot of the ulcer accompaniment type were thought to be due to secondary invasion, and proliferation at the ulcer base, while there were a more of the imitation film types on the esophagus, small intestines, and the large intestine⁴. The present case was thought to be of the accompaniment type, because the underlying ulcer was compatible with an accompaniment type.

In their histological findings, a fixed form invasion image of candida present a stratified array of the shelf from the gut mucous membrane side vertically, and the proliferation of the pseudohypha and the spore are typically observed at the same time². A lot of the surrounding tissue reaction were the necrosis. Additionally, a variety of inflammatory findings, such as the suppuration type, bleed type, and the false membrane type were presented². These reactions were also compatible with this case.

In conclusion, we experienced a rare case of gastric perforation associated with Candida infection. Earlier detection is necessary to treat candida infections, but they are often discovered under more advanced conditions, such as during a perforation. Therefore, it is necessary to keep in mind the possibility that Candida infection may be present not only in immunosuppressed patients and patients who have been using potent antacids but also elderly patients. Furthermore, when an upper gastrointestinal perforation is seen in an elderly patient, it is necessary to consider not only malignant diseases, but also opportunistic infections, such as Candida.

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