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Case report
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A Rare Case Report of Gastric Adenocarcinoma with Pneumoperitoneum after Jejunostomy Feeding

Coana Sukmagautama[1)], Aiman Hilmi Asaduddin[2)], Maulana Firdaus Syahrizal[2)], Arif Nur Khasan[2)], Desy Puspa Putri[1)]

[1)] Internal Medicine Department, Faculty of Medicine, Universitas Sebelas Maret
[2)]Clinical Clerkship Education, Faculty of Medicine, Universitas Sebelas Maret

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ABSTRACT

Background: Gastric cancer is the third highest cancer mortality globally. This malignancy can result in emergency complications such as gastric perforation which results in pneumoperitoneum. Currently, there are not many case reports which describe pneumoperitoneum in gastric cancer. In this report, we describe a gastric adenocarcinoma with pneumoperitoneum following jejunostomy feeding.
Case Presentation: A 54 years old male presented with abdominal pain, black-colored feces, and body weight decrease as much as 22 kg within a month. The physical examination revealed anemic conjunctiva, distended abdomen with abdominal pain, and pale skin. On the lab examination, the hemoglobin level was 9.9 mg/dL. The peripheral blood smear showed signs of iron deficiency anemia caused by chronic process. An endoscopic examination and biopsy showed a gastric mass with well-moderately differentiated gastric adenocarcinoma. The three positions abdominal x-ray incidentally found that the patient had pneumoperitoneum.
Results: Patient was diagnosed with Adenocarcinoma Gaster based on a gastric mass biopsy with hematoxylin-eosin staining. Then, the patient was treated with jejunostomy feeding. Thoracic and 3-position abdominal X-ray examinations revealed incidental findings of pneumoperitoneum and small bowel obstruction.
Conclusion: Jejunostomy feeding in gastric cancer patient may result in pneumoperitoneum as a complication. Gastric adenocarcinoma followed by iron deficiency anemia from chronic process post jejunostomy feeding was found with pneumoperitoneum complication.

Keywords: Gastric adenocarcinoma, endoscopy, pneumoperitoneum, jejunostomy feeding

Correspondence:
Aiman Hilmi Asaduddin. Clinical Clerkship Education, Faculty of Medicine, Universitas Sebelas Maret. Jl. Ir. Sutami 36A, Surakarta 57126, Central Java, Indonesia. Email: aimanhilmi02@-student.uns.ac.id.

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BACKGROUND

Gastric cancer is the third highest cancer mortality globally. Recent epidemiological study showed 1,089,103 of new gastric cancer cases with 7.7% new death recorded (Sung et al. 2021). Its come in two varieties, intestinal (well-differentiated) and diffuse (undifferentiated). Each kind differs in its morphology, etiology, and genetic makeup. A germline mutation (HDGC) in the cell

adhesion protein E-cadherin (CDH1) is the reason for the lack of intercellular adhesions in patients with a hereditary form of diffuse-type gastric cancer. No obvious precancerous lesions are present (Mukkamalla et al. 2023).

A progression from chronic gastritis brought on by H. pylori, pernicious anemia, or high-salt diets to chronic atrophic gastritis, which is caused by a reduction in acid production due to parietal cell loss, is described in one model for the "intestinal-type" of gastric cancer. Both intestinal and diffuse types of gastric cancer has approx.-imately sixfold increase in *H. pylori* infection, particularly adenocarcinoma of the distal stomach (Mukkamalla et al. 2023). However, gastric cancer can also appear as an emergency with hematemesis, visceral perforation, or obstruction of the stomach outlet. Most patients present with non-acute symptoms. It has been demonstrated that the emergency presentation of stomach cancer has an impact on overall survival, independent of any other considerations (Vasas et al. 2012).

Stomach cancer can result in ascites, which is an accumulation of fluid in the abdomen that puts pressure on the patient's abdomen and causes dyspnea. In the other hand, the most gastric cancer complications is malnutrition. Jejunostomy feeding is indicated for malnutrition patients with gastric cancer. Unfortunately, this procedure had high risk complications (15-55%) and mortality (2-10%). Perforations rarely occurs during jejunostomy feeding (Choi et al. 2017).

There are currently too few case studies in the medical literature that address the particular occurrence of pneumoperitoneum in patients with stomach cancer. The lack of examples with documentation has drawn our attention to the need to provide insightful information in this area. Here, we report a comprehensive and singular case study of a patient with gastric cancer who experienced pneumoperitoneum after receiving nutrition by jejunostomy. We hope to improve knowledge of the intricacies involved in the treatment and prognosis of stomach cancer by illuminating this uncommon relationship. This case study emphasizes how crucial it is to investigate and record similar incidents in order to improve patient care and medical procedures.

CASE PRESENTATION

A 54-year-old man with chief complaints of left upper abdominal pain accompanied by weight loss of 22 kg within a month (Body Mass Index, decreased from 27.1 kg/m2 to 18,7 kg/m2) and blackish feces in the last 9 months before admission. From the patient's family history, there was a history of prostate cancer in the patient's father and cervical cancer in the patient's siblings. The patient admitted to have irregular diet pattern since the complaint appeared and only eating porridge that was not immediately finished. He claimed to have had a 6-colf blood transfusion at another hospital before.

The patient appeared moderately ill with GCS E4V5M6. Physical examination revealed anemic conjunctiva, abdominal tenderness and distension, and pale integument. Blood pressure examination was 120/80 mmHg, respiratory rate 20x/min, pulse rate 80x/min, temperature 36.20C, SpO2 99%, and revealed VAS pain score of 6 in the left hypochondriac and lumbar region.

RESULTS

Several laboratory studies and a gastric endoscopy examination followed by tissue sample biopsy were performed. Routine blood test showed anemia (hemoglobin 9.9

g/dl, hematocrit of 31%, erythrocytes 4.34x103/L, MCV 70.3/µm, MCH 22.8 pg, MCHC 32.5 g/dL), thrombocytosis (platelets count 570x103/L), and leukocytosis (11.95x103/L). In the leukocyte count, the lymphocyte value was lower than normal at 14%, while the values of monocytes, neutrophils, eosinophils, and basophils were in the normal range. Liver function examination were showed in normal range (SGOT 16 U/L and SGPT 10 U/L) and kidney function test showed hyperemic (urea 48 mg/dL) with normal creatinine level. Electrolyte examination found normal potassium levels (4.48 mmol/L) with hyponatremia (130.70 mmol/L), hypochloremia (89.81mmol/L), and hypocalcemia (0.93 mmol/L). The peripheral blood morphology examination concluded iron deficiency anemia due to a chronic process. Subsequently, an endoscopic examination was performed with the result of an elongated mass in the corpus of stomach as shown in Figure 1.

From the endoscopic examination, tissue samples were taken for biopsy. The gastric mass biopsy results showed corpus-type mucosal tissue fragments with little mucosal muscularis and tumor-arranged papillary, partially infiltrative to the lamina propria. Mild polymorphic tumor cells of medium-large size, scanty cytoplasm, oval nuclei, elongated, hyperchromatic, and puffy stroma were found. The biopsy result of the gastric mass led to a manifestation of well-moderate differentiation of adenocarcinoma.

Patient was diagnosed with Adenocarcinoma Gaster based on a gastric mass biopsy with hematoxylin-eosin staining. Then, for further treatment the patient was referred to Dr. Moewardi Hospital. From the surgery department, the patient was hospitalized for general condition improvement and blood transfusion and jejunostomy feeding.

At 9 days after jejunostomy feeding, the patient complained of pain in the surgical wound. Thoracic and 3-position abdominal X-ray examinations revealed incidental findings of pneumoperitoneum and small bowel obstruction (Figure 3). Hereafter, the patient was hospitalized and planned for chemotherapy.

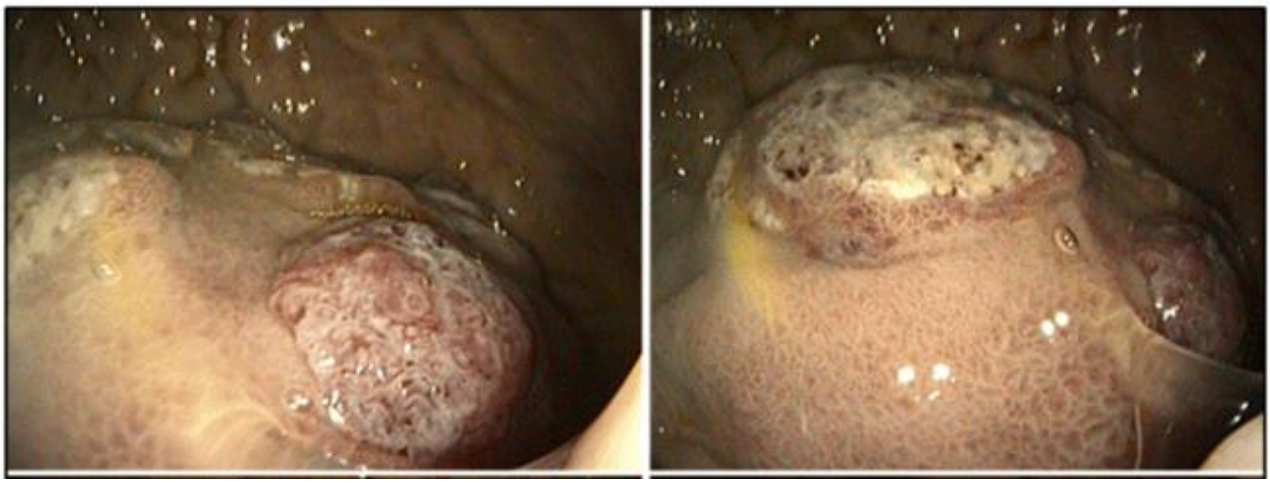
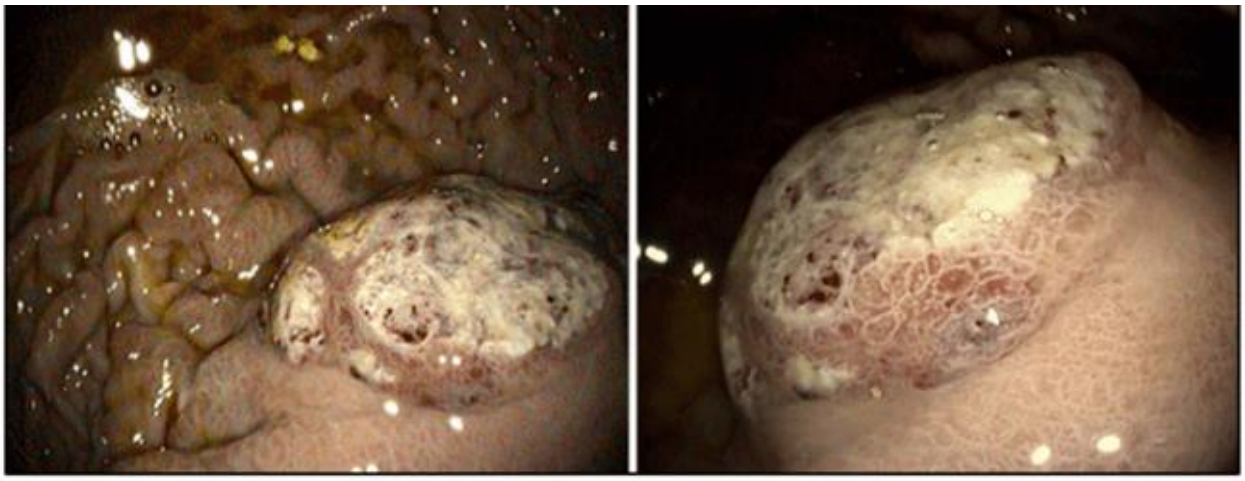


Figure 1. Gastric Endoscopy. Mucosa appears hyperemic, elongated mass in the gastric corpus with prominent cauliflower-like surface, fragile to bleed, and gapping pylorus



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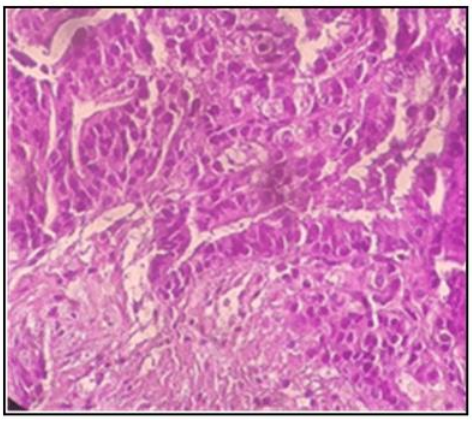

Figure 2. Gastric mass biopsy with hematoxylin-eosin staining showed well-moderate differentiation adenocarcinoma

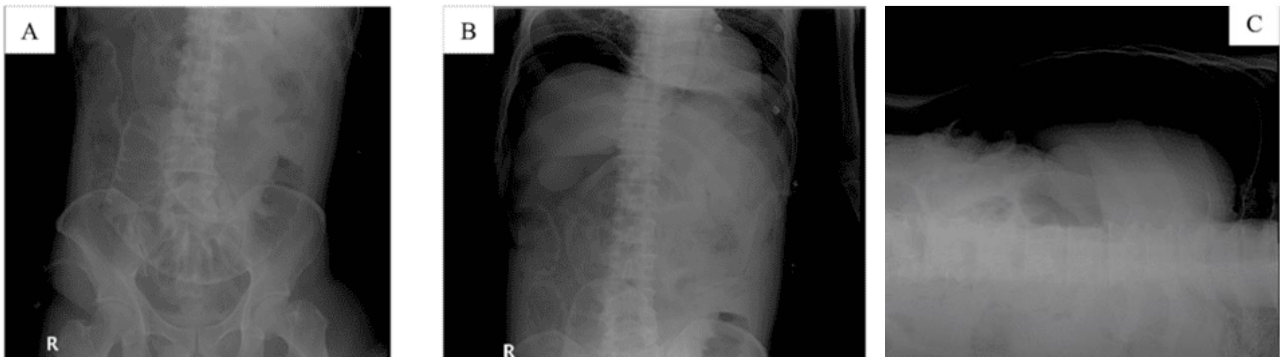

Figure 3. Three-Position Abdominal X-rays (A) supine, (B)erect, and (C) left lateral decubitus position. An infra diaphragmatic and superior hepatic free air picture forming a lateral decubitus sign. Multiple short air fluid levels of more than 5 are seen forming a pathological step ladder picture, lead to imaging of pneumoperitoneum and small bowel obstruction.

DISCUSSION

Gastric cancer may present with non-acute symptoms or emergency symptoms such as hematemesis, perforation, or bowel obstruction. The spontaneous perforation of gastric cancer is a rare complication that almost always has fatal consequences where it may lead into peritonitis. Gastric perforation has been mostly caused by gastric ulcers, with gastric cancer accounting for 10–16% of cases (Ignjatovic et al. 2016). Mortality rates in perforated gastric cancer ranged from 2–46% (Di Carlo et al. 2021). A previous case study mentioned that perforation due to gastric ulcers can cause pneumoperitoneum (Lobão 2013). The study reported a case of 78-year-old woman who had recently used non-steroidal anti-inflammatory drugs and had a history of peptic ulcer and arrived to the emergency room complaining of stomach pain and distention that had been getting worse over three days further had an emergency laparotomy (Lobão 2013). Even though gastric cancer can be detected preoperatively or during surgery, the decision regarding treatment in perforated gastric cancer is dependent on a number of emergency, oncologic, and patient variables, such as the severity of peritonitis, hemodynamic instability, sepsis, the presence of comorbidities, and the presence of metastases at exploration (Di Carlo et al. 2021). In this case, the patient revealed chief complaint of abdominal pain and blackish feces with physical examination results of abdominal tenderness and distension in stabile hemodynamic without sign of peritonitis or sepsis.

Esophagogastroduodenoscopy (EGD) is used as a screening procedure since early diagnosis of gastric cancer can greatly improve results. This diagnostic approach enables both direct sight of the lesion and biopsy-based diagnosis confirmation for histological examination (Quadri et al. 2017). For gastric cancer, the Lauren classification has identified two distinct histological types: diffuse and intestinal. The intestinal type is often well to moderately differentiated and is distinguished by glandular characteristics. Besides, the diffuse type is distinguished by cells that contain signet ring characteristics but are poorly differentiated (Lauren, 1965). The present gastric cancer case had well-moderate differentiation, which are included to the intestinal type.

In the other hand, multidetector computed tomography (CT) scan is the ideal imaging modality for the diagnosis, staging, and posttreatment surveillance of gastric adenocarcinoma. This modality could visualize the main tumor and assess for metastatic staging in the chest, abdomen, and pelvis due to its high resolution, thin slices, and multiplanar capabilities. In case of gastric cancer with perforation risk, CT scan could determine gastric wall thickness and rugal fold pattern (Quadri et al. 2017). CT scan was not applied in this present case thus we cannot evaluate the reduction of gastric wall thickness, which may lead to pneumoperitoneum.

In order to maintaining a sufficient calorie intake, it is crucial because the nutritional health of cancer patients is strongly related to their performance status when considering major medical and surgical management. As a result, there is a strong rationale to implant and use jejunostomy feeding in people with stomach and esophageal cancer (Choi et al. 2017). The National Comprehensive Cancer Network recommends jejunostomy feedings for gastric cancer with a risk of malnutrition (Nagtegaal et al. 2020). Jejunostomy feeding surgery is performed to manage nutrition problem in patients with gastrointestinal disorders. The surgery techniques

for jejunostomy feeding include open surgical technique (where the tube is inserted into the jejunum after the jejunum is pulled into an incision wound, placing the tube 5 cm proximally from the length of the bowel, creating a serosal tunnel, and attaching it into abdominal wall), laparoscopic technique (which intentionally creates pneumoperitoneum during its procedure), needle catheter technique, and percutaneous technique (D'Cruz and Cascella, 2023). In percutaneous technique, pneumoperitoneum is likely related to incomplete tube fixation against the abdominal wall, elevated intragastric air pressure, and escaped air from the stomach after needle puncture (Brotherton et al. 2021). Another study reported that jejunostomy feeding could also cause perforation and necrosis (Vieiro-Medina et al. 2017). In the present case, the patient suffered from gastric cancer with a risk of malnutrition marked by his BMI thus jejunostomy feeding was performed as a management of improving the general condition for chemotherapy plans. However, in this case, there was a complication of pneumoperitoneum after jejunostomy feeding.

In summary, gastric cancer is recognized as one of the leading causes of death from cancer and can lead to malnutrition. Jejunostomy feeding in gastric cancer may carry the risk of pneumoperitoneal complications. We reported a 54-year-old man with gastric adenocarcinoma and iron deficiency anemia due to chronic disease. The gastric cancer and jejunostomy feeding may have led to pneumoperitoneum. A diagnostic approach through appropriate and optimal methods is necessary for the management of gastric cancer patients with pneumoperitoneum.

AUTHOR CONTRIBUTION

Each author prepared the figures, authored the majority of the manuscript, and edited it.

CONSENT FOR PUBLICATION

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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