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Primary Closure of Gastric Perforation Using Seromuscular Omentum Insertion: A Case Report

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Abstract: Gastric perforation is the most common disease and a surgical emergency with high morbidity and mortality; therefore, early and precise management is needed. However, no consensus has been accepted regarding the best surgical treatment for gastric perforation closure so far. Although surgery methods are varied, laparotomy, and omental patch repair are still the gold standard. The risk of leakage after primary closure accompanied by omentopexy is still common, resulting high morbidity and mortality. This study aimed to discuss about the modified method by means of primary closure with seromuscular omentum insertion in a gastric perforation case. We modified the usual method using primary closure with seromuscular omentum insertion, to get the best way for perforation closure and reduced risk of leakage. After a week of surgical perforation closure, the patient was discharged and further observation resulted in no leakage. In conclusion, modified method by using primary closure with seromuscular omentum insertion in gastric perforation has good result without any leakage and recurrence.
Keywords: gastric perforation; omentum; primary closure

INTRODUCTION

Gastric perforation is the most common disease and is a surgical emergency with high morbidity and mortality; therefore, early and precise management is needed. Surgical treatment in patient with gastric perforation aims to correct leakages.[1] However, no consensus has been reported regarding the best surgical treatment for gastric perforation closure. About 60% of gastric perforation cases are caused by peptic ulcer disease due to non-steroid anti-inflammatory drugs (NSAIDs). Moreover, about 2–3% ulcers will undergo perforation.[2] Although surgery methods are varied, laparotomy and omental patch repair are still the gold standard. Albeit, the risk of leakage after primary closure accompanied by omentopexy is still common, resulting high morbidity and mortality.[3]

The use of an omental patch has been reported in some studies. The Graham technique is the standard method used to close perforated peptic ulcers.[4,5] Ellatif et al[6] reported a laparoscopic procedure in a patient with a perforated peptic ulcer and showed no significant differences in length of stay, time to start oral intake, postoperative complications, and surgical outcomes in patients who underwent the usual procedure and those who were not treated with omental patch. Zhu et al[7] also reported that the mortality was not significantly different between patients with peptic ulcer who underwent operative management and those treated with omental patch and gastric resection.

Giant perforated peptic ulcers are considered not to be treated using an omental patch. There is a belief that using this modality often results in postoperative leakage or obstruction of the gastric outlet.[8] However, another study showed that leakage and mortality rates in patients with a small and giant perforated peptic ulcer treated with the Cellan Jones omental patch were not significantly different.[9-11] Therefore, this mini-review is focused on evaluating the postoperative complications of using the omental patch.

CASE PRESENTATION

A 71-year-old man came with complaint of abdominal pain that experienced one day before his admission to the hospital. Initially the patient complained of pain in the pit of his stomach three days before admission to the hospital. Pain then spread throughout the abdomen one day before admission. He also complained nausea without vomiting, fever, or shortness of breath. The patient had a history of taking painkillers due to joint pain. History of black bowel movements three weeks ago was treated at the public health center. The patient was then taken to the Manembo-nembo Hospital Bitung for further treatment. On physical examination, the abdomen was flat, bowel sounds decreased, tenderness over the entire abdominal area. and muscular defense was found. On digital rectal examination there were loose anal sphincter tone, ampulla collapse, smooth mucosa surface, and positive circular tenderness. Laboratory examination showed an increase in leukocytes to 10,700/uL. On examination of the AP/Upright chest X-ray, it appeared that there was free air subdiaphragm (Figure 1). The Boey's score showed a total of 1. The patient was diagnosed with peritonitis caused by gastric perforation, and was given antibiotic therapy, analgesics, nasogastric tube (NGT) insertion, and catheter. He was planned for a laparotomy for gastric exploration and repair.

Cellan-Jones suggested omentoplasty without primary closure of the defect to prevent narrowing of the duodenum, meanwhile Graham published his result with a free omental graft.[3,5] In this case, we modified those methods using the seromuscular omentum insertion for a primary closure (Figure 2). After a week of surgical perforation closure, the patient was discharged, and in further observation there was no leakage found.

Figure 1. Abdominal X-ray and chest X-ray revealed free air subdiaphragm

Figure 2. Intraoperative; primary closure of gastric perforation with seromuscular omentum

DISCUSSION

Gastric perforation is a full-thickness injury of the wall of the organ. Since the peritoneum completely covers the stomach, perforation of the wall creates a communication between the gastric lumen and the peritoneal cavity. If the perforation occurs acutely, there is no time for an inflammatory reaction to wall off the perforation, and the gastric content is free to enter the general peritoneal cavity, causing chemical peritonitis. Perforations occurring over a prolonged period may be contained locally by the inflammatory reaction.[12,13]

Perforated peptic ulcer is a challenging surgical condition. The use of proton pump inhibitors (PPI) has resulted in decrease in the rates of elective peptic ulcer surgery. Ulcer perforation represents 10–20% of the recognized complications of peptic ulcer disease, meanwhile the perforated large/giant ulcers comprise ~1–2% of the perforated peptic ulcers and account for both high morbidity (20–70%) and mortality (15–40%). The reported mortality rate varies from 1.32% to nearly 20% in different series.[14]

Gastric perforation may be spontaneous or due to trauma. Laparotomy and omental pacth repair are still the gold standard. In 1929, Cellan-Jones, suggested omentoplasty without primary closure of the defect to prevent narrowing of the duodenum, and then in1937, Graham, published his result with a free omental graft. Although very often surgeons mention about using the Graham pacth, but the actually used was the pedicled omental patch described by Cellan-Jones which has since been the standard of surgical repair.[3,5] In this case, we modified those methods using the seromuscular omentum insertion for a primary closure (Figure 2).[9] This method aims to close the perforation intact and thoroughly. After a week of perforation closure surgical, this patient was discharged and in further observation there was no leakage found.

CONCLUSION

Gastric perforation is a surgical emergency. There are many methods for perforation closure; Cellan-Jones (1929) and Omental (Graham) Patch (1937) are the usual technique used. We modified the method by using primary closure with seromuscular omentum insertion to get the best way for closure, and after further observation, no recurrence was found.

Conflict of Interest

The authors affirm no conflict of interest in this study.

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