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### Intensive Management of Diffuse Peritonitis Caused by Spontaneously Healed Gastric Perforation: A Case Report

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#### ABSTRACT

**Background:** Gastric perforation will cause acute peritonitis. Proper diagnosis and management, especially in ICU, are needed to prevent complications and even death from this event. This study aimed to describe the intensive management of diffuse peritonitis caused by gastric perforation. **Case presentation:** A 61 years old male patient presented with pain in the whole abdomen for 6 days before admission. The pain began at the epigastrium and suddenly spread to the whole abdomen. The pain was felt continuously and increased by movement. Routine blood examination revealed anemia, leukocytosis, and radiology examination found homogeneous confluence was found in the abdominal, dilated small intestine, psoas line was not visible, in the left lateral decubitus position, an air-fluid level and free air were found. The patient underwent diagnostic laparoscopic surgery + peritoneal lavage on emergency surgery for 2 hours, obtained a resolution of gastric perforation, and the patient was treated postoperatively in the ICU of Dr. M. Djamil General Hospital. **Conclusion:** Cases of spontaneous resolution of gastric perforation are not only in terms of surgical management but in terms of postoperative care. It also plays an important role in the success and good results in cases of gastric perforation.

#### 1. Introduction

Perforation is a serious complication of peptic ulcers. A typical clinical manifestation of gastric perforation is an acute abdomen that requires immediate treatment. Gastric perforation will cause acute peritonitis. Patients will experience intense pain. The most common symptoms are acutely intense pain, tachycardia, and tension in the abdominal wall. This perforation alone accounts for more than 70% of all deaths from gastric perforation. Proper diagnosis and management are needed to prevent complications and even death from this event. Mortality in the first 30 days due to peptic ulcer perforation ranges up to 20% and increases with increasing age of the patient

undergoing surgery (12-47%).<sup>1</sup> Surgical treatment is required as soon as the patient is diagnosed with gastric perforation. If surgery and broad-spectrum antibiotics are performed quickly, the prognosis is good. Meanwhile, if the diagnosis, surgery, and administration of antibiotics are late, the prognosis becomes bad.<sup>2,3</sup>

Peritonitis is one of the reasons for intensive care unit (ICU) admission after complicated pneumonia. Studies showed increased rates of healthcare-associated peritonitis remaining a leading cause of death and morbidity in ICU patients. Guideline management of initial fluid resuscitation and intravenous antimicrobial therapy should be given in

the treatment of patient peritonitis with sepsis. In the intensive care unit, light sedation in a patient with peritonitis can reduce the length of stay in the ICU and allows early mobilization.<sup>1,4</sup>

Postoperative complications are the most common cause 3 - 12 million deaths each year.<sup>5</sup> Kabongo and Erzingatsian (2021) reported mortality rate of ICU patients with gastric perforation with sepsis was elevated at 85.29% and was increased gradually.<sup>6</sup> The exactness of the initial diagnosis of generalised peritonitis is of foremost importance, but clinical evaluations depend on clinical judgment.<sup>7</sup> This study aimed to describe the intensive management of diffuse peritonitis caused by gastric perforation.

## 2. Case Presentation

A 61-year-old male patient presented with pain in the whole abdomen for 6 days before admission. The pain began at the epigastrium and suddenly spread to the whole abdomen. The pain was felt continuously and increased by movement. The patient had nausea and a history of recurrent abdominal pain about 25 days ago.

The patient had no history of vomitus. Micturition and defecation are normal, and no history of bloody stool. The patient has a history of drugs with routine consumption of painkillers since 6 months ago. There is no story of the family who has a similar condition as the patient. The patient was cooperative and vital sign was normal, with VAS score 6 and qSOFA score 2.

Abdominal examination showed Abdominal Distended, there is no visible contour and peristaltic, decreased bowel sound, and there is muscle rigidity and tenderness. Laboratory findings showed Hb 7,3 mg/dl, Leukocyte 16.550/mm<sup>3</sup>, Albumin 2,2 gr/dl, Procalcitonin 55,41. Radiologic Findings found that there was on the thoracic radiograph, subdiaphragmatic air was not found. In the supine abdominal position, a homogeneous confluence was found, dilated small intestine and psoas line was not visible. In the left lateral decubitus position, an air-fluid level and free air were found.

The patient underwent diagnostic laparoscopic surgery + peritoneal lavage on emergency surgery for 2 hours, obtained a resolution of gastric perforation, and the patient was treated postoperatively in the ICU of Dr. M. Djamil General Hospital.

## 3. Discussion

In this case report, it was reported that a 61-year-old male patient who was hospitalized at the Dr. M. Djamil General Hospital Padang was admitted through the emergency room. In this patient, a diagnostic laparoscopic emergency operation and peritoneal lavage were performed with intraoperative findings of a perforation in the stomach and resolution/spontaneous closure.

The clinical symptoms of gastric perforation are severe. Depending on the size of the hole, and the loss of blood, clinical symptoms can be examined from light to severe localized pain until signs of peritonitis and the patient can become shocked. Signs and symptoms can include nausea and vomiting, abdominal distension and pain is the most common clinical appearance, and sudden onset rare clinical symptoms are ileus, fever, emesis, respiratory distress, hematemesis, or hematochezia

However, what is of concern in cases of spontaneous resolution of gastric perforation is not only in terms of surgical management but in terms of postoperative care. It also plays an important role in the success and good results in cases of gastric perforation. Management in the intensive care unit is very important and very much needed in the postoperative care of major surgery, such as surgery in cases of gastric perforation. This is because postoperatively, the patient requires very close monitoring in a number of ways, including monitoring blood pressure, monitoring the respiratory system using a respirator/ventilator, very strict monitoring of fluid administration, and several other things with the aim of monitoring is to prevent the occurrence of excess fluid, albumin, electrolytes, kidney function and nutritional deficiencies in patients who have undergone digestive surgery.

Albumin levels of less than two caused hemodynamics to be disturbed. Thus we must improve the albumin with a target albumin level above two so that we do not use inotropic and vasopressor in patients.

There was an increase in PT 15.8 APTT 89.1 (control 29.1), which increased 3x above normal values, and a D-dimer value is 4758, proving that coagulation disorders had occurred so that the patient might progress to DIC if the sepsis process did not get appropriate antibiotics. Albumin levels of less than two caused hemodynamics to be disturbed. Thus we must improve the albumin with a target albumin level above two so that we do not use inotropic and vasopressor in patients.

Patients with severe hypoalbuminemia, so patients are given 25% of albumin correction. Albumin plays a key role in the critically ill patient acting as a prognostic marker and as a therapy in the form of human albumin solutions. Both the Society of critical care medicine (USA) and the European Society of intensive care medicine endorse the surviving sepsis campaign recommendation of albumin as the colloid of choice when resuscitating patients with sepsis and septic shock. Again, guidance on when to move from crystalloid to colloid during resuscitation is left to individual clinician discretion.<sup>8</sup>

Starting in the ICU, procalcitonin 16,17, after receiving adequate antibiotic therapy, procalcitonin before the patient was discharged from the ICU 0.56, indicating sepsis has been appropriately treated. In giving antibiotics, we do not wait for the culture results because the new culture results come out after 7 - 10 days; if we wait for the culture results, it will be too late, and the possibility of germs that are colonies is not the germs that cause sepsis and can be a delay in giving antibiotic therapy for sepsis.<sup>9</sup>

The patient was admitted to the ICU already with sepsis. The patient was administrated with a broad-spectrum antibiotic until a blood culture was reported, and then the antibiotic regimen was changed to an empirical antibiotic. In patients with perforated gaster, guidelines recommend starting a rapid regimen of an

empiric broad-spectrum antibiotic against a mixture of Gram-negative, Gram-positive, and anaerobic bacteria.<sup>10,11</sup> If sepsis is not treated properly, the patient will progress to multi-organ failure.<sup>12</sup> In patients with sepsis and septic shock, antibiotic therapy is the most important treatment in the critical care unit and plays an important role in the management of severe infections.<sup>13</sup> Kabongo and Erzingatsian (2021) reported patients with gastric perforation with sepsis. The ICU mortality rate was high at 85.29% and was statistically significant.<sup>6</sup>

Recommendation Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021. For adults with possible septic shock or a high likelihood of sepsis, recommended administering antimicrobials immediately, ideally within one hour of recognition. Hemodynamics is disturbed, possibly due to the decline in albumin (1.9) value below 2, so it requires inotropic or vasopressor in addition to a sufficient volume of blood components while albumin is corrected. At least reach a value above two.

Hypoalbuminaemia is related to an increase in mortality risk in the intensive care unit. Albumin has multiple physiological effects. One of the most common is the preservation balance of colloid-osmotic insistence, which regulates the acid-base balance, brings out hormones and drugs, and has some impact on immunology.<sup>14-17</sup> Acid-base balance disorders that occur in sepsis patients must have adequately treated. The metabolic disorders that occur must also be corrected. So that metabolic acidosis is resolved. In the diagnosis of this patient, there is also a decrease in blood sugar, nice sugar in critically ill patients 150 - 180 mg/dl. For this reason, sufficient access must be provided with a central vein to meet the patient's calorie needs and maintain good blood sugar (nice sugar), one of which is by titrating d40%.

In addition to parenteral infusion, which is accompanied by adequate electrolytes and glucose, an additional d40% is also given to achieve nice blood sugar in critically ill patients. Recommendation Surviving Sepsis Campaign: International Guidelines

for Management of Sepsis and Septic Shock 2021, patient with sepsis in critical care recommend initiating insulin therapy at a glucose level of  $\geq 180\text{mg/dL}$  ( $10\text{ mmol/L}$ ). Hyperglycemia ( $> 180\text{mg/dL}$ ), hypoglycemia, and increased glycemic variability are associated with increased mortality in critically ill patients. The American Diabetes Association, in its most recent recommendations for glycemic control of critically ill patients, recommended the initiation of insulin therapy for persistent hyperglycemia  $> 180\text{ mg/dL}$  and, after that, a target glucose range of  $140\text{--}180\text{ mg/dL}$ .<sup>9</sup>

During treatment in the ICU, patients are given adequate fluid therapy, and this is in line with the theory that fluid administration with adequate is safer than a restrictive regimen. Intravenous fluid therapy is one of the most important treatments in the intensive care unit. There is a change of time expected to reach normovolemia, followed by maintenance therapy, and then fluid therapy should be decreased when the patient consumes oral salt intake.<sup>6</sup> Cases of spontaneous resolution of gastric perforation are not only in terms of surgical management but in terms of postoperative care in the intensive care unit. It also plays an important role in the success and good results in cases of peritonitis diffusion caused by gastric perforation. The outcome of patients with diffuse peritonitis, especially in critical care, depends on the timely start of treatment adequately of critical care interventions in an appropriate environment.<sup>18-20</sup>

#### 4. Conclusion

Cases of spontaneous resolution of gastric perforation are not only in terms of surgical management but in terms of postoperative care. It also plays an important role in the success and good results in cases of gastric perforation.

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