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Interventional Intensive Care in Postoperative Period of Gastric Surgical Repair Due to Perforated Peptic Ulcer Disease: A Case Report

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A B S T R A C T

Introduction: Perforated peptic ulcer is the most common indication for emergency gastric surgery. good management of postoperative peptic ulcer perforation patients in the ICU will reduce patient mortality rates. **Case presentation** A 76-year-old male patient presented with a major complaint of pain throughout the abdomen that had worsened since 1 day, the abdominal pain had been felt for 4 days before admission. The patient had a history of painkiller drug consumption routinely for 3 years. The patient's vital signs were normal, with a qSOFA score 1 and a VAS score 5. Abdominal physical examination showed the abdominal distended, no visible contour and no visible peristaltic, decreased bowel sound, and there is tenderness and rebound tenderness at the whole abdomen Patient was taken up for emergency laparostomy, then the patient underwent diagnostic laparoscopic in an elective setting with intraoperative findings of gastric perforation, then patient continued with the gastric repair. In the postoperative period, the patient was treated in the ICU of Dr. M. Djamil General Hospital. **Conclusion:** Intensive care management for post-gastric repair surgery patients is generally the same as for other abdominal surgery patients. The intensive care management needs comprehensive treatment, starting from oxygen therapy, monitoring, analgesia, fluid therapy, antibiotic therapy, glycemic control, and nasogastric tube nutrition.

1. Introduction

Perforation is one of the serious complications of peptic ulcer disease. A perforated peptic ulcer is an emergency condition that requires an indication for immediate gastric surgery. Delayed management will increase patient morbidity and mortality rates.[1] Approximately 40% of perforated peptic ulcers will lead to death if not treated promptly.[2] The management of perforated peptic ulcers can be either operative or non-operative. Some of the things that should be considered in the selection of this management are the general condition of the patient, the age of the patient, significant comorbidities, and complicated pathology. However, most patients with perforated gastric ulcers should be treated with immediate surgery.[1,3]

Operative management for perforated peptic ulcers is a surgical repair. The perforation is usually closed with a simple omental patch or the perforated area may undergo a wedge resection.[4] However, the surgical treatment of the perforation has not changed much over and perforated peptic ulcer remains a life-threatening condition with a high mortality of up to 40 and morbidity of up to 50% being reported. Factors such as age, shock (hypotension), and other comorbidities have been described as factors contributing to higher postoperative complications.[1] Therefore, the prevention, prompt identification, and treatment of potentially serious complications that may arise during the postoperative period is of paramount importance. Therefore, patients require comprehensive management in the intensive

care unit (ICU), to reduce post-operative mortality.[5] ICU admission rates for perforated peptic ulcer were 26% to 60% and the mean length of stay in ICU is 2-6 days. [6,7] This study aimed to describe the intensive care in postoperative gastric repair due to peptic ulcer disease.

2. Case Presentation

A 76-year-old male patient presented with a major complaint of pain throughout the abdomen that had worsened since 1 day, the abdominal pain had been felt for 4 days before admission. The pain started from the epigastrium and then the pain radiated throughout the abdomen. The pain was felt continuously and increased with movement. The patient had a history of nausea but no history of vomiting. History of defecation two days ago and no history of bloody stool. The patient had a history of painkiller drug consumption routinely for 3 years. The patient had no history of surgical operation, no story of the family with the same condition as the patient, and didn't have any comorbidities. The patient's vital signs were normal, with a qSOFA score 1 and a VAS score 5. Abdominal physical examination showed the abdominal distended, no visible contour and no visible peristaltic, decreased bowel sound, and there was tenderness and rebound tenderness at the whole abdomen. Rectal examination showed sphincter tone was normal and there was no mass, no faeces, and blood was visible on the glove. Based on history and physical examination, the patient's clinical diagnosis was diffuse peritonitis.

Then, the patient underwent laboratory and imaging investigation. Laboratory findings showed Hb 10.9 mg/dL, leucocyte 21.000/mm^3, thrombocyte 442.000/mm^3, albumin 2.2 g/dL, procalcitonin 0.70 ng/mL. Radiological examination was carried out in three positions. First, in the chest X-ray, the subdiaphragmatic air was not found. The second, in the supine abdominal position, a homogenous confluence was found, with no dilated small intestine, and the psoas line was not visible. And the last, in the left lateral decubitus position, an air-fluid level and free air were found. Following adequate resuscitation, the patient was taken up for emergency laparotomy, then the patient underwent diagnostic laparoscopic in an elective setting with intraoperative findings of gastric perforation, then the patient continued with the gastric repair. In the postoperative period, the patient was treated in the ICU of Dr. M. Djamil General Hospital.

3. Discussion

A 76-year-old male patient presented with a major complaint of pain throughout the abdomen that had worsened since 1 day, the abdominal pain had been felt for 4 days before admission. The pain started from the epigastrium and then the pain radiated throughout the abdomen. The pain was felt continuously and increased with movement. In this patient, the patient has a history of painkiller drug consumption routinely for 3 years. One of the things that can increase the risk of gastrointestinal toxicity is long-term use of NSAIDs and age over 65 years. long-term use of NSAIDs can cause gastric perforation. Perforation can occur spontaneously, the two main factors involved in the etiology of gastric perforation are long-term non-steroidal anti-inflammatory drugs (NSAIDs) and *Helicobacter pylori* (*H. pylori*). 30-50% of gastric perforations that occur are associated with long-term NSAID use.[1]

Signs and symptoms of gastric perforation can include severe abdominal pain and vomiting. if the perforation causes peritonitis, it will cause fever and signs of infection. clinical appearance can be seen as abdominal distension and sudden epigastric pain. Patients may also complain of acute onset of chest pain.[1,8] Physical examination should include vital signs and a thorough abdominal examination. The majority of patients will have tachycardia, tachypnea, fever, and generalized abdominal tenderness. Bowel sounds may be absent and rebound and guarding are likely to be present. The patient has a normal vital sign and his qSOFA score was 1 because of his respiratory rate was 22 times/minute. qSOFA was intended to predict the risk of mortality and morbidity due to sepsis. The criteria used are systolic blood pressure (≤100mmHg), respiratory rate (≥22 breaths/minute), and GCS (≤14). The presence of 2 or more qSOFA points was associated with a greater risk of death or prolonged ICU stay.[9]

From laboratory findings, the patient's Hb was 10.9 g/dL, which showed that the patient had anemia. The patient's leucocyte was 21.000 /mm^3, which indicates that there was an inflammation condition. Laboratory examinations performed on perforated gastric ulcers are also important in establishing the diagnosis of perforated gastric ulcers, laboratory examinations are important to rule out important differential diagnoses, such as acute pancreatitis which has the same clinical picture but has different management, as well as to understand disorders in various other organ systems that may coincide.[1]

During the postoperative period, the patient underwent laboratory investigation on the first day in the ICU. From laboratories findings, there were some abnormal findings, such as Hb 10,5 g/dL, leucocyte 14.690/mm^3, albumin 2,2 g/dL, sodium 128 mmol/L; From blood gas analysis, pH 7,46; pCO_2 42,2; pO_2 135,5 HCO_3- 30,4 and BE 6,5. From laboratory findings, the patient has anemia, leucocytosis, hypoalbuminemia, hypo sodium, and metabolic alkalosis.

This postoperative approach can be enhanced using the principles of enhanced recovery after surgery (ERAS) which is a multimodal and multidisciplinary approach to the care of surgical patients. The ERAS process involves a multidisciplinary team consisting of the surgeon, anesthesiologist, nurses, and staff from the units caring for the patient.[10,11] Enhanced recovery after surgery has 4 elements, these are: "(1) comprehensive preoperative evaluation and preparation of the patient, (2) optimum anesthesia and minimally invasive surgery to reduce the patient response to surgical stress, (3) adequate postoperative management of the symptoms such as pain with early mobilization, and (4) prompt reintroduction of a normal diet".[5]

Analgesia is one of the concerns of the ERAS strategy. Early mobilization requires maximum pain control, and because of that, control of pain sensation is crucial. The pain can be assessed by validated scales. In patients who can communicate using a visual analog scale (VAS) and verbal numerical scale. Patients who cannot communicate using the behavioral pain scale and critical care observation tool, together with pain-indicating behavioral scales.[11] Pain management in this patient was administered Fentanyl as an analgesic drug. Fentanyl is a potent and selective 4-anilidopiperidine μ-opioid analgesic. Fentanyl is commonly used for pain management, especially in patients with mechanical ventilators who are treated in Intensive care, and more potent than morphine. Morphine has several side effects, such as pruritus, histamine release, and accumulation of morphine-6-glucuronide, in patients with renal impairment.

In general, fluid administration in postoperative patients should be closely monitored, especially in patients who already have renal impairment. Currently, protocols that include liberal fluid administration are considered safer.[12] There are several periods in fluid administration in postoperative patients, There is a period of fluid replacement intended to achieve normovolemia, then a period of maintaining fluid balance, and then fluid therapy will be gradually decreased as soon as the patient takes oral intake. Each patient requires a specific supply, depending on the patient's condition, type of surgery, blood loss, and pre-existing comorbidities, especially renal impairment. In general, 30-60 ml/hour of balanced crystalloids is acceptable. The aim is to maintain an equilibrium fluid balance.[11]

The total maintenance fluid requirements were calculated with 30-60 cc/body weight/day, with the 75 kg bodyweight of the patient so the daily fluid requirements range was 2.250-4.500 cc/day. The patient received tutofusin IV 1.800 cc/day, NaCl IV; for hypo sodium correction; 1.600 cc/day, PRC; for anemia correction; 200 cc/day, so total fluid correction was 3.600 cc/day. After the patient got fluid therapy and correction for abnormal laboratory findings, the patient was re-checked and the results were obtained, Hb increased to 11,7 g/dL, albumin increased to 2,7 g/dL, sodium increased to 135 mmol/L. Antibiotic therapy in the postoperative period on this patient using ceftriaxone 2 gram/day IV. Ceftriaxone is a broad-spectrum β-lactam antibiotic and is often prescribed for critically ill patients. Because ceftriaxone has both renal and biliary excretion and a relatively long half-life of 6 to

8 hours, doses are not adjusted based on renal failure.13 A study showed that 2 g of ceftriaxone daily was associated with better clinical outcomes than 1 g daily of ceftriaxone among ICU patients.[13] In this case, the patient fasted for 2 days after surgery, and then on the third day he was given a liquid diet via NGT, the diet given was increased gradually until the patient could tolerate solid feeding. Postoperative management of patients after abdominal surgery generally requires the use of a nasogastric tube to avoid oral intake of nutrients in postoperative patients in the first day or two is believed to prevent complications that may occur postoperatively, such as intestinal obstruction, aspiration pneumonia, nausea, and vomiting, and may protect the surgical anastomosis from bowel movement. [13]

4. Conclusion

Intensive care management for post-gastric repair surgery patients is generally the same as for other abdominal surgery patients. The intensive care management is needed comprehensive treatment, starting from oxygen therapy, monitoring, analgesia, fluid therapy, antibiotic therapy, glycemic control, and nasogastric tube nutrition.

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