WHIOCE PUBLISHING PTE. LTD.
PROVIDING
FIRST-CLASS SCIENTIFIC INFORMATION
FOR TOP SCHOLARS

2026 Volume 11, Issue 3
Advances in Precision Medicine
ISSN: 2424-9106 (Online)
ISSN: 2424-8592 (Print)

Nursing Care of a Patient with Severe Acute Pancreatitis after EVAR for Thoracoabdominal Aortic Penetrating Ulcer

Panpan Li, Guoqin He*, Chunhua Liu, Lijuan Yuan, Deyu Kong, Qing Sun, Yujie Xie
Baoying County People's Hospital, Baoying 225800, Jiangsu, China

***Author to whom correspondence should be addressed.**

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: To summarize the nursing care of a patient with severe acute pancreatitis after endovascular aortic repair (EVAR) for a thoracoabdominal aortic penetrating ulcer. Nursing points: Adopt a dual strategy of restrictive fluid resuscitation combined with goal-directed fluid management to effectively maintain hemodynamic stability; implement effective airway management and early use of high-flow oxygen therapy to maintain adequate oxygenation; implement a stepped pain management strategy, combined with the Meridian Flow Theory of Traditional Chinese Medicine to optimize the analgesic program and reduce symptoms of abdominal pain and bloating; according to the enteral nutrition tolerance classification and management requirements, develop a personalized diet plan to ensure energy supply. After multidisciplinary treatment and meticulous care, the patient recovered well and was successfully discharged from the hospital on the 21st day after surgery. During the follow-up visit 1 month later, the patient recovered well and had no recurrence of symptoms, such as abdominal pain and bloating.

Keywords: Penetrating aortic ulcer; Acute pancreatitis; Goal-directed fluid management; Enteral nutrition; Critical care

Online publication: March 26, 2026

1. Introduction

Aortic penetrating ulcer refers to a pathological condition in which the intima of the aorta ruptures, resulting in ulcer-like protrusions on the aortic wall. It is caused by the erosion of aortic atherosclerotic plaques and inflammation of the aortic wall. As the disease progresses, it can eventually lead to aortic rupture. In order to prevent adverse events such as aortic rupture and the need for surgical treatment, endovascular aortic repair (EVAR) has been widely used in the treatment of aortic penetrating ulcers [1]. Acute pancreatitis is a common digestive system disease worldwide. Severe acute pancreatitis accounts for about 5%-10% of acute pancreatitis cases. It has a rapid onset and rapid disease progression. Systemic inflammatory response syndrome and multiple organ dysfunction syndrome appear in the early stage of the disease, and the mortality rate is as high as 20–30% [2]. Our hospital admitted a patient with a thoracoabdominal aortic penetrating ulcer who was complicated by severe acute pancreatitis after surgery on April 16, 2025. The nursing experience is now reported as follows.

2. Clinical data

2.1. General information

The patient, a 75-year-old female, was admitted to the hospital on April 16, 2025, due to "chest pain and discomfort for more than 10 days." The admission diagnosis was "thoracic and abdominal aortic ulcer, type 2 diabetes, coronary atherosclerosis, and hypertension 2-level (very high risk)." On April 18, thoracoabdominal EVAR was performed at the vascular surgery department, and two stents were inserted into the thoracic aorta during the operation. On the first day after surgery, the patient complained of upper abdominal pain, nausea and vomiting. The abdominal pain was not relieved after vomiting. An emergency blood amylase test showed 1372.7 μ/L. Abdominal CT showed peripancreatic exudation and a small amount of pleural effusion on both sides. Acute pancreatitis was diagnosed. Symptomatic treatments such as fluid replenishment, fasting, gastrointestinal decompression, inhibition of pancreatic enzyme secretion, and anti-infection were given according to the doctor's instructions. The patient's abdominal pain worsened on the second postoperative day, and he was transferred to our department for treatment. At the time of admission, the patient was conscious, with an acutely painful face, shortness of breath, positive tenderness under the xiphoid process that radiated to the left shoulder, and a small amount of crackles could be heard at the base of both lungs. The body temperature was 36.4℃, the heart rate was 113 beats/min, the blood pressure was 165/92 mmHg (1 mmHg = 0.133 kPa), the mask oxygen inhalation was 8L/min, and the blood oxygen saturation was 89%. Laboratory test results showed: hemoglobin 86 g/L, white blood cells 21.64 × 109/L, blood urea nitrogen 14.91 mmol/L, blood creatinine 241 μmol/L; blood gas analysis showed: pH value 7.30, arterial oxygen partial pressure 63mmHg, alkali remaining -4.6 mmol/L.

2.2. Treatment and outcome

After admission, the patient's blood pressure fluctuated between 160–175/90–105 mmHg. He complained of abdominal pain and distension, and his BISAP score (Bedside Index of Severity of Acute Pancreatitis) was 3. The doctor advised that the patient was critically ill and immediately administered high-flow humidified oxygen therapy, adjusting the oxygen concentration to 40%, establishing a 3-way intravenous channel, and actively replenishing fluids to maintain the function of important organs. Continuous micro-pump infusion of nitroglycerin was used to control blood pressure at the target level, antibiotics were upgraded to imipenem to fight infection, traditional Chinese medicine acupoint application was used to promote intestinal peristalsis, and raw rhubarb retention enema was used to promote excretion. On April 21st and 22nd, the patient's abdominal pain was still unrelieved, with a pain score of 5. The reexamination of blood creatinine was 183.7 μmol/L, indicating that the renal function was still damaged, the blood pressure fluctuated between 140-160/90-100mmHg, and the oxygenation index fluctuated between 190–220 mmHg. A reexamination of the abdominal CT showed that peripancreatic leakage increased and there was still effusion in the thoracic cavity on both sides, and the diagnosis was severe acute pancreatitis. Multidisciplinary consultations are organized according to the patient's condition, and dual strategies of restrictive fluid resuscitation and goal-oriented fluid management are adopted to optimize the infusion plan to dynamically regulate blood volume and prevent related complications. Pay close attention to airway management, and take effective measures based on the patient's oxygenation index value to guard against the occurrence of acute respiratory distress syndrome. According to the "three-step analgesic method", follow the doctor's advice to upgrade the analgesics from non-steroidal drugs to central analgesics to improve the analgesic effect and reduce the impact on blood pressure. The albumin was rechecked on April 25 and dropped from 30.4 g/L at admission to 25.8 g/L. Enteral nutrition was started immediately and changes in abdominal circumference and intra-abdominal pressure were closely monitored. On May 2, the patient's abdominal pain and distension were significantly relieved, and he began to take imported food. On May 7, the white blood cell count was 7.33 × 109/L. The antibiotic was downgraded to cefotaxime and the patient was encouraged to exercise moderately at the bedside. After active symptomatic treatment and care, the patient's condition improved and he was discharged from the hospital on the 21st day after surgery, and he recovered well after 1 month of follow-up.

3. Nursing

3.1. Adopt the dual strategy of restrictive fluid resuscitation combined with goal-directed fluid management to effectively maintain hemodynamic stability

Early fluid therapy in acute pancreatitis is particularly critical, as it can effectively improve tissue perfusion and prevent pancreatic necrosis and multi-organ failure. This patient is elderly and has a history of coronary heart disease. He is currently undergoing EVAR surgery for a penetrating aortic ulcer, and his postoperative blood pressure is always at a high level. To a certain extent, he needs to avoid excessive fluid resuscitation, control blood volume, and reduce vascular tension. The nursing team quickly sorted out the condition and promoted multidisciplinary consultation. Specialist nurses from the Department of Gastroenterology, Vascular Surgery, Cardiovascular Medicine, and Endocrinology checked the patient at the bedside and decided to initiate a restrictive fluid resuscitation plan [3]. The infusion volume was precisely controlled at an infusion rate of no more than 5 mL/kg/h. At the same time, based on the goal-oriented strategy for fluid infusion proposed in the guideline [4], the doctors and nurses jointly set a target heart rate of < 100 beats/min and a systolic blood pressure of < 150 mmHg. The nursing team established 3 intravenous channels, 1 channel of octreotide was pumped in a small amount at 250 μg/h, 1 channel was pumped in a small amount of nitroglycerin at a starting dose of 500 μg/h, and the 3rd channel was arranged for the intravenous infusion of crystal gel liquid according to the patient's condition. During the early resuscitation process, the resuscitation effect is evaluated every half hour, a bedside infusion response monitoring sheet is established, and heart rate, blood pressure, pulse oxygen, urine output, laboratory test-related indicators, etc., are monitored [5]. By flexibly adjusting the infusion speed and dynamically adjusting the hourly dose of nitroglycerin pumped, precise control of blood volume management is achieved.

3.2. Implement effective airway management and use high-flow oxygen therapy early to maintain adequate oxygenation

When the patient entered the hospital, she complained of chest pain and tightness, heart rate 113 beats/min, respiration 23 beats/min, blood oxygen saturation 89%, a small amount of crackles auscultated at the base of both lungs, chest CT showed a small amount of pleural effusion, and blood gas analysis showed: PaO2: 63 mmHg, PaCO2: 45 mmHg, and oxygenation index was 153 mmHg. Based on the patient's past medical history and physical signs, to rule out acute coronary syndrome and pulmonary artery thrombosis, bedside electrocardiography and emergency pulmonary artery CTA examination were performed promptly, and no abnormalities were found. Acute respiratory distress syndrome is prone to occur in the early stages of acute pancreatitis. To be alert to the occurrence of this complication, the nursing team quickly evaluated the patient's lungs using the modified Marshall scoring system. The score was 3 points, indicating severe impairment of lung function. At this time, the patient's airway management has become the focus of clinical nursing. The nursing measures are as follows:

(1) Raise the head of the bed 45° to move the diaphragm downward, reduce the pressure on the chest cavity, and improve the patient's pulmonary ventilation function.
(2) Carry out high-flow humidified oxygen therapy, set the initial oxygen concentration to 40%, and closely monitor the oxygenation situation.
(3) Follow the doctor's advice and give atomized treatment with acetylcysteine and budesonide to eliminate phlegm and relieve asthma, and assist the patient with effective cough training every day.
(4) Assist the patient to turn over and pat his back to promote the effective discharge of lung secretions, clear the airway on time, and ensure effective ventilation. After the above measures, the patient's arterial blood oxygen partial pressure increased from 63 mmHg on April 2 to 128 mmHg on May 2, and the oxygenation function was corrected in time.

3.3. Implement a stepped pain management strategy and optimize the analgesic plan combined with the Meridian Flow Theory of Traditional Chinese Medicine

Pain is the main symptom of acute pancreatitis, and pain relief is a clinically important treatment goal. The patient's physical examination was positive for tenderness under the xiphoid process when he was admitted to the hospital, radiating

to the lower back, and the pain score was 6 points. The abdominal CT reexamination on the second day after admission showed that the peripancreatic exudate continued to increase, which aggravated the stimulation of the pancreatic capsule and peritoneal nerve endings. The continuous pain stimulated the patient's blood pressure to increase, aggravating the risk of intraluminal aortic stent leakage and displacement. Based on the patient's clinical manifestations, the nursing team followed the doctor's advice and upgraded the antibiotic imipenem to control the infection and reduce the inflammatory reaction caused by pancreatitis. According to the "three-step analgesic method", the analgesics were upgraded from non-steroidal anti-inflammatory analgesics to the central analgesic drug nisondorolac tromethamine according to the doctor's instructions to improve the analgesic effect. In order to relieve the patient's symptoms of abdominal distension and pain, the nursing team combined traditional Chinese medicine to promote the recovery of gastrointestinal function [6]. The nursing measures are as follows:

(1) Apply Glauber's salt externally to the abdomen every day to improve pancreatic blood circulation, promote intestinal peristalsis, and reduce symptoms of abdominal distension.

(2) Based on the patient's usual morning defecation habits, the nursing team selected acupoints on time based on the theory of Meridian flow. The acupoints were Zusanli, Pishu, Weishu, and Zhongwan. Because Qi and blood flow into the large intestine meridian at Mao hour (5–7 a.m.), the night shift nurse is scheduled to use Chinese medicine containing rhubarb, hemp seed, citrus aurantium, and borneol for acupoint application on the patient between 6–7 o'clock every day to promote intestinal peristalsis. The application time is 2–4 hours each time.

(3) Raw rhubarb retention enema has the effect of purging fire and detoxifying, clearing away dampness and heat, purging the bowels and relieving pain to a certain extent in patients with acute pancreatitis. In order to further extend the retention time of raw rhubarb for enema, the nursing team improved the conventional enema method: 50g of raw rhubarb was boiled in 200ml of boiling water for 10 minutes to remove the residue, and the liquid was cooled to about 40℃ for later use [6].

The enema tool was changed to a 50 mL syringe + sputum suction tube, the intubation depth is 30–40 cm, and the patient is instructed to adopt a rotational position, that is, raise the buttocks 10 cm during enema, take the left lateral decubitus position (slowly inject 2/3 of the liquid) → supine position → right lateral decubitus position (slowly inject the remaining 1/3 of the liquid), and then lie on the right side for 20 minutes. In the end, the patient's pain was effectively controlled, and the pain score dropped from 6 points to 2 points after 1 week of the above intervention. The patient's treatment compliance and subjective comfort were improved.

3.4. Develop a personalized diet plan based on enteral nutrition tolerance classification and management requirements

Acute pancreatitis is highly catabolic, and early initiation of enteral nutrition can reduce the incidence of infectious complications, multiple organ dysfunction syndrome, and death [7]. This patient had early abdominal pain, obvious distension, and weak intestinal function. Parenteral nutrition was used first, and intravenous nutrition preparations such as albumin and Lejia were supplemented as needed. On the 6th day after admission, the patient's abdominal pain and distension were relieved, bowel sounds were 2–3 times/min, and the albumin was reduced to 25.8 g/L in the re-examination. A nutritional risk screening was performed and the NRS-2002 score was 4. The patient was immediately consulted by the nutrition department and a nasojejunal tube was inserted for trial enteral nutrition. The patient in this case is 157 cm tall. According to the energy calculation formula [8], the daily energy requirement is 1300–1560 kcal. Based on the grading and management plan of enteral nutrition tolerance, the nursing team dynamically assessed every 6 hours during enteral nutrition. On the first day of enteral nutrition, a small amount of normal saline was introduced on a trial basis. The patient had no intolerance. According to the doctor's instructions, 500 mL of BIPLA was administered through a nasogastric pump at 30 mL/h. On the second day of enteral nutrition, the patient developed abdominal distension, vomited gastric contents once, a volume of about 200 mL, and auscultated bowel sounds 1–2 times/min, and enteral nutrition was suspended. On the 3rd day, bowel sounds were auscultated 3 times/min. The patient had no complaints of abdominal pain

and distension. He continued to receive 30 mL/h nasogastric feeding of Beprex as directed by the doctor. On the 4th day, the patient was adjusted to 50 mL/h nasogastric pumping of Beprex. The patient had no intolerance, and then gradually increased to the target amount. On the 8th day, the patient began to take oral food, and the nursing team formulated a personalized recipe for him, as follows: Breakfast was 20 g of whey protein powder + 200 g of vegetarian noodles, and 25 g of sugar-free lotus root starch was added as a snack at 9:00 in the morning. Lunch is 120 g of millet cake + 200 mL of boiled vegetable soup, and an additional meal of 200ml of mixed vegetable juice at 15:00. Dinner is 150 g of vegetarian wontons + 200 mL of thick millet soup, and 20 g of whey protein powder is added at 20:00. After the above nursing measures, the patient's energy needs basically met the standard during hospitalization, and his blood sugar, albumin, and weight all reached the expected levels.

4. Conclusion

This case is a patient with severe acute pancreatitis combined with hypertension, coronary heart disease, and aortic ulcer after EVAR surgery, which is rare in clinical practice. In the early stage, the patient's symptoms were severe and his lung and kidney functions were damaged. The nursing team evaluated and concluded that there was a conflict between the requirements for adequate fluid resuscitation for pancreatitis and volume management after EVAR. They then adopted predictive care through critical thinking, formulated personalized nursing measures to dynamically regulate blood volume, and actively and effectively intervened in hypoxemia, so that the patient's symptoms could be managed under control. In terms of pain management, the nursing team collaborated with traditional Chinese medicine to innovate and change the traditional rhubarb retention enema method. Based on the Meridian flow theory and the patient's defecation habits, the patient's abdominal pain and distension were effectively relieved by selecting acupuncture points and applying Chinese medicine on time. During the enteral nutrition period, stepwise nutrition management was implemented early, and the patient's nutritional status was improved after intervention with a personalized diet plan in the later period. In the future, further evidence can be accumulated to improve the nursing standards for such rare cases.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Zhang RJ, 2024, Analysis of Factors Related to the Progression of Aortic Penetrating Ulcer and Research on Endovascular Treatment, thesis, Chinese People's Liberation Army Army Medical University.

[2] Cui YF, Wang XM, Shang D, et al., 2024, Guidelines for the Diagnosis and Treatment of Severe Acute Pancreatitis with Integrated Traditional Chinese and Western Medicine. Journal of Clinical Hepatobiliary Diseases, 40(06): 1114–1125.

[3] Zhang XZ, 2022, Analysis of the Effectiveness of Restrictive Fluid Resuscitation in the Treatment of Severe Acute Pancreatitis. Chinese Practical Medicine, 17(15): 58–60.

[4] Pancreatic Surgery Group of the Surgery Branch of the Chinese Medical Association, 2021, Chinese Guidelines for the Diagnosis and Treatment of Acute Pancreatitis (2021). Zhejiang Practical Medicine, 26(06): 511–519 + 535.

[5] Zhang WH, Li L, Zhu LQ, et al., 2023, Construction of an Evaluation System for Early Fluid Resuscitation Management in Acute Pancreatitis. Journal of Practical Clinical Medicine, 27(14): 104–108 + 114.

[6] Li BJ, Zhou XF, Huang ZC, 2022, Clinical Study on Raw Rhubarb Enema Combined with External Application of Glauber's Salt in the Adjuvant Treatment of Acute Pancreatitis. Hubei Journal of Traditional Chinese Medicine, 44(04): 13–16.

[7] Qi YJ, Zhang JQ, 2024, Research Progress on Nutritional Support Treatment of Acute Pancreatitis. Journal of Lanzhou University (Medical Edition), 50(06): 83–85 + 94.

[8] Cao KY, Gong S, Cheng JX, 2025, Summary of the Best Evidence for Early Enteral Nutrition in Patients with Severe Acute Pancreatitis. West China Medicine, 40(04): 561–567.

Publisher's note

Whioce Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.