

# Nursing Care of Short Bowel Syndrome Complicated by Biliary Pancreatitis: A Case Report

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**ABSTRACT** Short bowel syndrome (SBS) in adults is a condition mainly caused by surgical resection of the small bowel; it is characterized by the inability to maintain balances of protein, fluid, and electrolytes when on a regular diet. SBS has a high mortality rate if left untreated. Herein, we report a case of SBS complicated by acute biliary pancreatitis in our center. Due to acute mesenteric arterial occlusion and intestinal necrosis, the 58-year-old male patient underwent bowel resection with enterostomy in September 2020. He was diagnosed with SBS in December 2020. In the beginning, parenteral nutrition was the main treatment approach. After the symptoms of abdominal pain, abdominal distension and vomiting were improved, the patient switched to receiving the combination of enteral and parenteral nutrition support. With the nutrition support and full range of nursing care, the patient's nutritional status was improved, and he was discharged with the tube. In this case report, we detailed the core elements of nursing care in managing patients with SBS.

**Keywords** Short bowel syndrome; Nutritional support; Nursing care; Case report

## INTRODUCTION

Short bowel syndrome (SBS) is a syndrome in which the digestion and absorption area of the small intestinal is suddenly reduced after extensive intestinal resection due to various reasons, and the residual functional bowel cannot maintain the nutritional needs of patients, which leads to the water, electrolyte and metabolic disorders, and malabsorption of various nutrients, followed by organ function decline and metabolic dysfunction of the body <sup>[1]</sup>. Although SBS after clinical upper bowel resection is rare, it has a mortality rate of 18% to 25% <sup>[2]</sup>. Currently, the treatment and care of patients with SBS are challenging. Nutritional support remains to be the most important and basic treatment approach of SBS <sup>[3]</sup>. On December 21, 2020, a patient with short bowel syndrome complicated by biliary pancreatitis was admitted to our center. After placing a nasojejunal tube for enteral nutrition and peripherally inserted central catheter (PICC) infusion of nutrient solution for parenteral nutrition, the patient gradually recovered and transitioned to being able to eat by mouth. Eventually, the patient's symptoms disappeared, his nutritional status was improved, accompanied by increased weight, and he was discharged smoothly. The detailed nursing care of this patient

is reported as follows.

## **CASE REPORT**

This 58-year-old male patient (height: 172 cm, weight: 64 Kg) underwent small bowel resection with enterostomy due to acute mesenteric arterial occlusion and intestinal necrosis in September 2020. His ileocecum was also removed, and the remaining small bowel was approximate 100 cm after the operation. About 2000 ml of chyme sample was drained daily from the postoperative fistula bag. Since October 2020, the patient had repeated abdominal discomfort, sometimes accompanied by hiccup, nausea, and vomiting, but did not receive any treatments. On December 20, 2020, the patient vomited twice (watery gastric contents) and experienced aggravated abdominal pain, accompanied by abdominal distension, fatigue, dizziness, and smooth defecation at the fistula, with weight loss of about 20 Kg. On December 20, his biochemical test results showed that blood amylase level was 245U/L, lipase level was 696U/L, and Na<sup>+</sup> level was 128mmol/L. His emergency computerized tomography (CT) scan suggested biliary pancreatitis and short bowel syndrome.

On December 21, the patient underwent PICC insertion under local anesthesia, with an exposure of 7.5 cm. The nasojejunal tube was placed at a depth of 100 cm; the X-ray confirmed that the tube reached the jejunum. The patient was then given the enteral nutrition suspension TPF (Peptison) pumped at 20ml/h. At the same time, the patient was given intravenous nutrient solution infusion and oral pancreatin enteric-coated capsules of 600 mg (tid). On December 25, the patient's abdominal pain and distension symptoms were relieved. However, around 3000 ml of yellow fluid was discharged from the enterostomy every day. It was considered that the patient's small bowel was short, but the jejunal tube was too deeply placed. The nasojejunal tube implantation depth was then adjusted to 85 cm. The patient's gastrointestinal reactions and stoma defecation were closely observed. The patient's serum electrolytes and liver and kidney function were monitored daily. The pancreatic function was monitored weekly. The use of parenteral nutrient solution was adjusted according to the patient's condition. Started from January 10, 2021, the patient was given oral short-peptide nutritional powder (Peptison). On January 15, the patient complained that Peptison had a poor taste and he was unwilling to eat Peptison. The patient was instructed to switch to enteral nutrition powder (Ansu) and change the diet from a liquid diet to a normal diet. The patient's symptoms disappeared gradually, and all his biochemical parameters went back to normal. His bodyweight increased to 72 Kg. On February 24, 2021, the patient was discharged with a nasoenteric tube and continued receiving home enteral nutrition (HEN).

The core elements of SBS nursing care are described in detail below.

## **NURSING CARE OF NUTRITIONAL SUPPORT**

### **Nursing care of parenteral nutrition (PN)**

- 1) The principle of "three checks and seven pairs" and aseptic operation should be strictly implemented. The nutrient solution should be prepared for immediate use, and stored and used according to the requirements of use.

- 2) The infusion pipeline should be replaced within 24 hours, and the pipe connection should be properly fixed to avoid contamination or air embolism.
- 3) The speed of the infusion pump should be strictly controlled to ensure that the liquid is infused at a constant rate within 24 hours to avoid glucose metabolism disorders and PN-related liver disease <sup>[4]</sup>.
- 4) PICC pulsatile flushing is performed every 6-8 hours to prevent catheter blockage, and positive pressure sealing with heparin (10u/ml) should be performed after infusion.
- 5) The all-in-one nutrient solution is used, and intravenous drugs are uniformly prepared by the preparation center. The preparation process shall be strictly implemented in accordance with the operating procedures and specifications for parenteral nutrition solutions.
- 6) The urine output, mental changes or increased heart rate, pale complexion, cold limbs and other symptoms of electrolyte and glucose metabolism should be strictly monitored, and blood glucose should be monitored regularly, with a frequency between Q8H and Q6H.

In this case, PICC was placed on the day of admission, and an intravenous infusion of 3L nutrient solution was started. During this period, the infusion pump was strictly used to control the speed at 100ml/h. The intravenous nutrient solution in our hospital was prepared by the static center in a unified 3L bag, which could reduce the contamination during the preparation. The patient was infused with 3110 mL of intravenous nutrition solution daily, which contained 100 mL of alanine glutamine, electrolyte trace elements and sugars to supplement various nutrients required by the patient.

### **Nursing care of PICC**

- 1) The operation should be carried out in strict accordance with the latest expert consensus of clinical venous catheter maintenance operations. The patient and the catheter should be evaluated in detail according to the venous catheter maintenance evaluation checklist. The education for patients and their families should be carried out in accordance with the health education checklist for the maintenance of intravenous catheters.
- 2) The tube should be sealed with a 10ml syringe with a positive pressure tube sealing method to reduce the backflow of blood into the lumen and reduce the risk of clogging and catheter-related bloodstream infection <sup>[5]</sup>.
- 3) Transparent dressings should be used for fixation by placing, shaping, and stroking without tension centered on the puncture site. It should be replaced every 7 days, or timely replaced when exudation and blood seepage occur at the puncture site and the dressing appears rolled edges, loose, wet, contaminated, and damaged integrity <sup>[6]</sup>.
- 4) The heparin cap connector should be replaced every 7 days, or when there is blood residue in the infusion connector, the integrity is impaired, before the blood culture sampling, or when it is contaminated <sup>[7, 8]</sup>.

During the hospital stay, the patient's PICC was working well without any complications, and the patient was discharged with a tube.

### **Nursing care of nutrition**

- 5) The principle of nutrition from less to more, concentration from low to high, and speed from slow to fast should be strictly followed when implementing enteral nutrition.
- 6) Strictly abide by the principle of aseptic operation when preparing enteral nutrient solutions.
- 7) Use a dedicated nutrition pump for constant speed and warming infusion to improve patient comfort and intestinal tolerance.
- 8) Replace the syringe every 24 hours, and flush the tube every 6 – 8 hours with warm water or normal saline to prevent tube blockage.
- 9) Adopt the high platform method to properly fix the jejunal nutrition tube to prevent pressure sores, and check the skin condition of the fixed part in each shift.
- 10) Measure the exposed length of jejunal nutrition in each shift to prevent catheter prolapse.
- 11) Elevate the head of the bed by 30° to 45° to reduce airway aspiration [9] and instruct patients to take oral care twice a day.
- 12) Instruct the patient to get out of bed more often.

In this case, due to concurrent pancreatitis, the patient was admitted to our department on the day of admission. On December 21, a nasojejunal tube was placed at a depth of 100 cm to reduce gastric retention, reduce abdominal pain and vomiting, and improve nutritional status and small intestinal compensation. On December 22, the patient had increased defecation at the stoma, which was yellow and watery, with a volume of about 3000ml. Considering that the patient's intestinal tract was short, the depth of nasojejunal tube placement was adjusted to 85 cm on December 25. On December 28, the patient's stoma defecation returned to normal. The nutritional mixture TPF (Peptison) was pumped at a constant rate of 20ml/L and warmed to 35-40 degrees with a warmer. During this period, the quality and quantity of intestinal stoma discharge were closely observed. The speed and quantity of nutrition were adjusted according to the patient's biochemical indicators. The operation was performed in strict accordance with the requirements of nutrition nursing, and blood samples were drawn every 2 days to examine liver and kidney function according to the doctor's advice. The abnormal results were treated in time. The department made a 24-hour intake and output registration form to accurately record the intravenous infusion volume, nutrition infusion volume, food intake volume, water intake, urine volume, ostomy output and vomiting volume of the patients, which was convenient to master the patient's condition. During nutrition, the symptoms of abdominal pain and abdominal distension disappeared, the nutritional status was improved, and no related complications occurred.

### **Nursing of Complications**

- 1) Gastrointestinal reactions: the infusion rate and amount of nutrient solution should be strictly controlled and the doctor's advice for symptomatic treatment of gastrointestinal symptoms should be timely followed. The main gastrointestinal reactions of nutrition are vomiting, abdominal distension and diarrhea. The infusion should be stopped immediately if the patient vomits.

- 2) Infection: strict compliance with the principle of aseptic operation is the key to prevent infection.

In this case, the patient had abdominal distension, nausea and vomiting symptoms at the early stage of admission and about 3000ml of yellowish watery feces was discharged from the ileostomy bag every day. After timely reporting to the doctor, the depth of nasojejunal tube was adjusted according to the doctor's advice, and the pumping speed was controlled to 20ml/h. During the infusion, the patient was placed in a semi-decubitus position. After the symptoms of abdominal distension, nausea and vomiting were relieved, the volume, concentration and speed of nutritional infusion were appropriately adjusted to continue pumping. After the above treatment, the symptoms of abdominal distension, nausea and vomiting were relieved, and the infusion of nutrient solution could be completed.

### **Nutritional guidance for home enteral nutrition**

- 1) Instruct patients and their families to observe whether patients have nausea, vomiting, abdominal distension, diarrhea and other gastrointestinal complications during the infusion of enteral nutrition. Strictly record the daily enteral nutrition infusion and diet, as well as the patient's ileostomy output and urine output, in strict accordance with the input and output registration form. If there is any abnormality, please contact the doctor and seek medical treatment in time.
- 2) Instruct patients to measure their body weight once a week in the morning after discharge, monitor whether the body weight is stable or slowly increased. If there is a significant weight loss (> 5% weight loss within 1-3 months), they should seek medical attention in a timely manner.
- 3) Instruct patients to regularly monitor or examine blood biochemistry and other nutritional parameters according to the doctor's advice after discharge <sup>[10]</sup>.
- 4) Inform and instruct patients and their families to purchase corresponding tools, master the preparation methods, precautions, infusion methods, control of infusion rate and concentration, and warming methods of nutritional preparations.
- 5) Pay attention to prevent the occurrence of complications such as nasoenteric tube displacement, blockage or nasopharyngeal injury, guide them to cope with complications. The patients should seek medical attention in a timely manner if any complications occur.

### **Dietary Guidance**

- 1) Help patients understand that a large part of the small intestine of patients with SBS has been removed, and the digestion and absorption of nutrients such as fat and protein are impaired, which easily causes steatorrhea. Therefore, attention should be paid to avoid intestinal decompensation due to improper diet, including disturbing digestion and absorption function, accelerated intestinal peristalsis, and increased frequency of defecation <sup>[11]</sup>.
- 2) Introduce the process and time of intestinal compensation to the patients and their families in detail, the transition from nutrition to daily diet, and gradually reduce the dosage of nutrition and increase the daily diet. Due to incomplete compensation of digestion and absorption function and the inability of daily diet to meet nutritional needs, short peptide preparation based nutrition should be added

according to the doctor's advice, and the proportion of nutrition can be increased. The nutrition department should be consulted to guide the patient to develop recipes.

- 3) Inform patients that their daily diet should be based on high-carbohydrate, high-protein, low-fat and low-residue diet. Moreover, it is necessary to add vitamins, trace elements, electrolytes and calcium supplements according to the doctor's instructions. Patients should pay attention to food hygiene and avoid cold and irritating foods that can cause or aggravate diarrhea <sup>[12]</sup>. If diarrhea is severe or weight loss is significant (weight loss >5% within 1-3 months), the patient should see a doctor promptly.

### Narrative Care

In the process of communicating with patients, nurses should pay attention to psychological counseling and apply the five methods of narrative care to the nursing process, including problem externalization, deconstruction, rewriting, external witnessing, and treatment documentation <sup>[13]</sup>.

- 1) Problem externalization: the nurse in charge and the nursing team leader should make a narrative plan, conduct interviews with the patients on the understanding and prognosis of short bowel syndrome, so that the patients can express their concerns or questions they may have.
- 2) Deconstruction: the nurse in charge should analyze, organize and summarize the content of the interview, and find a common way to solve the problem by letting patients recall similar experiences. It should be noted that records need to be kept.
- 3) Rewriting: the nurse in charge should explain and play narrative micro-videos for patients.
- 4) Witnessing: the nurse in charge should invite family members to participate in the narrative process.
- 5) Application of treatment documents: certificates or some letters and cards are issued to patients to encourage them.
- 6) Prepare a narrative schedule according to the characteristics of narrative research <sup>[14]</sup>, as shown in Table 1.

**Table 1. Narrative schedule**

Time	Content	Purpose	Duration
D1 after admission	Guide patients to understand the disease; Watch micro-videos of patients with similar cases	Let nurses understand patients' concerns while listening	30 min
D2 after admission	Guide patients to tell stories about struggling with the disease; Watch micro-videos of similar cases	Build patients' confidence to overcome the disease	30 min
D3 after admission	Instruct patients to tell their family	Encourage active family	30 min

	stories; watch micro-videos.	support	
D7 after admission	Watching micro-video on rehabilitation of patients with short bowel syndrome	Develop a healthy lifestyle	30 min
Before discharge	Issue certificate or small cards	Build patients' confidence in treatment and recovery	5 min

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## **SUMMARY**

In this case, due to concurrent acute pancreatitis, parenteral nutrition was the main treatment approach at the early stage. After the symptoms of abdominal pain, abdominal distension and vomiting were improved, the patient switched to receiving parenteral nutrition support. The patient was discharged with the tube after the nutritional status was improved. For patients with SBS, nutritional support is still the most important and basic treatment. This case report supports that a full range of nursing care should be provided to facilitate the recovery of patients with SBS. Given that SBS is a chronic disease that brings great challenges to patients and their families, we can also use the means of narrative nursing to enhance the enthusiasm of patients and their families, so that they can actively cooperate, master the relevant knowledge of home care, and improve the quality of life of patients.

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## **STATEMENT**

There is no conflict of interest in this article.

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