CASE REPORT

Intestinal Nutrition Played a Vital Important Role in an Intestinal Perforation Patient with Chronic Constipation: A Case Report

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ABSTRACT

Introduction • Nutrition treatment is important in the critically ill patient. Nutritional therapy should be instituted as soon as possible if indicated.

Case presentation • A 64-year-old woman with malnutrition and intestinal obstruction with gastrointestinal bleeding came to our emergency room. She had a history of constipation. After CT scan, we found perforations in the digestive tract. Because she could not tolerate surgery and parenteral nutrition (PN), we chose to start enteral nutrition (EN). She recovered after the initiation of EN.

Discussion • Chronic constipation may cause intestinal obstruction, which is rare but fatal. Providers should evaluate the nutritional status for the intensive care patient and start PN/EN at once if necessary. EN may help the closure of perforations.

Conclusion • EN may play a vital important role even in the patients who have perforations in the digestive tract. Chronic constipation may cause obstruction and perforation, which are rare but fatal. (*Altern Ther Health Med.* 2023;29(1):40-43).

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INTRODUCTION

The value of nutritional treatment is frequently underestimated, especially in the critically ill patient. It has been demonstrated that for those critical patients, systemic inflammation appears which will accelerate the negative nitrogen balance and metabolism, leading to a higher mortality rate.[1] Guidelines show that we should evaluate the nutritional state and initiate nutrition treatment immediately.[2,3] Sometimes, nutrition treatment may become the vital part in a patient's treatment. Here we provide a patient with malnutrition and gastrointestinal perforation that may have died without enteral nutrition (EN).

CASE PRESENTATION

The research was conducted in Peking Union Medical College Hospital, Chinese Academy of Medical Science and Peking Union Medical College. A 64-year-old woman was admitted to our hospital because of abdominal pain and black stool. One month ago, she felt periumbilical colic after drinking a bottle of cold milk. X-ray showed intestinal obstruction. A week later, she underwent probe laparotomy. Closed bowel obstruction was identified during the procedure, and a section of the intestines was resected. However, she was diagnosed with septic shock on the second day. After anti-infection treatment for about 14 days, she gradually recovered from the infection. However, the patient

Figure 1. the skinny leg of the patient. The arm in the picture is her husband's, a man with a BMI of only about 18 kg/m^2.

Figure 2. The first image shows the contrast media in bilateral paracolonic sulcus. The second image shows gastrointestinal perforation.

found that the lower abdomen became stiff. Gastrointestinal bleeding was confirmed. Blood count showed that hemoglobin decreased from 117g/L to 66g/L. The patient had a previous history of constipation for 5-6 years; the defecation period was 3-4 days. Physical examination showed that she was extremely malnourished with a body mass index (BMI) calculated as 10.89kg/m^2 (Figure 1). Vital signs were relatively stable but she had poor spirits. Her abdomen was stiff and bowel sounds were diminished.

Soon after admission, she was sent to intensive care unit for hemorrhagic shock. Unfortunately, a bleeding point was not identified after angiography. Enhanced computerized tomographic (CT) scanning found no tumors or inflammatory bowel disease (IBD). Combined positron emission tomography/computerized tomographic (PET/CT) also did not identify a bleeding point. As she was stable at that time, a radiography examination for the whole digestive tract was performed, identifying the gastrointestinal perforation and its location (Figure 2). Contrast media exudation is seen in bilateral paracolonic sulcus.

In light of her cachexia, we evaluated her nutritional status. Nutritional Risk Screening 2002 (NRS-2002) was used.[4] The score was calculated to more than 6, that means she needs immediate nutritional treatment. A peripherally inserted central catheter (PICC) was established and parenteral nutrition (PN) initiated. Three days later, ultrasound demonstrated that thrombosis of deep veins in her both upper extremities had developed.

The treatment team was faced with a dilemma. Extremely low body weight and malnutrition excluded her from operation. However, she had no central venous catheter which could support her PN. Because the location of the perforation was in the lower part of the intestine, nutrient absorption would not be influenced. We cautiously began EN.

The proper timing of initiation of EN as well as the type of EN needed were not clear. The nutrition department helped us to choose peptison for her. Initially, the rate was only 20 milliliter per hour (ml/h). After only 3 hours of feeding, she complained of chills and her temperature rose. Seven days later, we started EN again with better success. The patient tolerated EN well. We gradually increased the feeding volume. Three weeks later, she could intake more than 1000 ml per day. The contrast media in paracolonic sulcus could hardly be seen with repeat CT scan (figure 3). Her body weight increased to 35 kg.

The patient was discharged from hospital soon thereafter. It has now been 3 months since her discharge. The jejunal nutrition tube has been pulled out under the doctors' direction. She weighs nearly 40kg and can take food orally. She lives a normal life. (figure 4)

Figure 3. Contrast media in paracolonic sulcus is scarcely visible. The first image was obtained on Sep 5th and the second scan was obtained on Oct 9th.

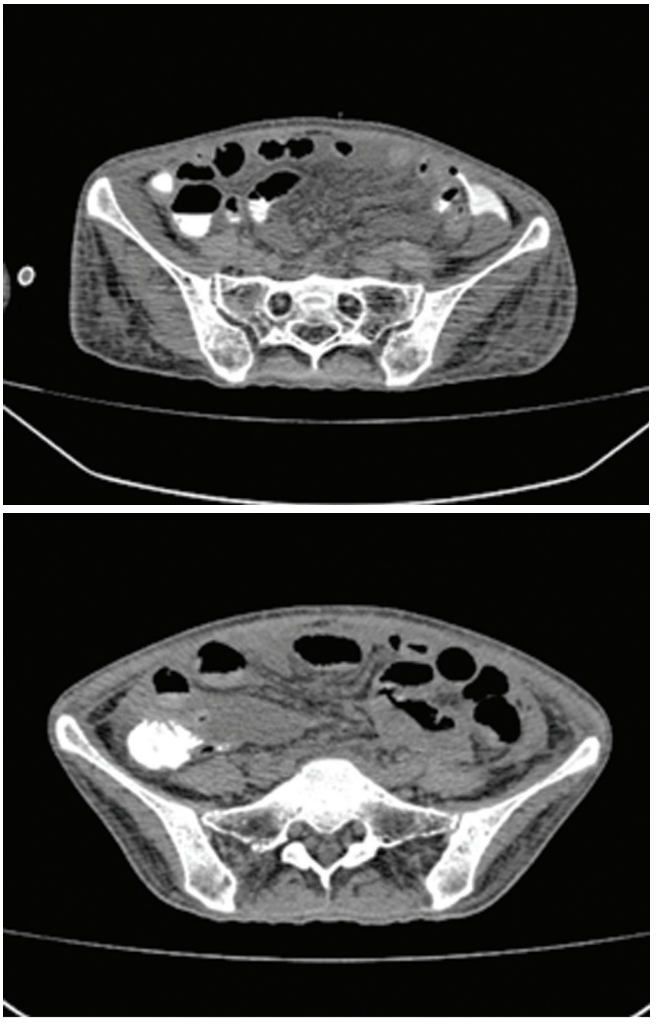

Figure 4. the patient at follow-up.

DISCUSSION

The patient initially presented with the manifestation of incomplete intestinal obstruction. Gradually, she developed gastrointestinal perforation. CT scans and PET/CT were negative for malignancy and IBD which are the causes of perforation in most cases.[5] We noticed that she had a long history of chronic constipation, which may cause the obstruction and perforation.

Stercoral perforation is a rare cause of perforation, but it may be life-threatening. It may be diagnosed by CT scan and the commonest findings might be a combination of fecal impaction and extraluminal air.[6] Chronic constipation can cause pressure against the intestinal wall. When the pressure exceeds 35 cm H_2O for several hours, bowel wall necrosis develops, leading to bleeding and eventually perforation.[7] When acute abdominal pain develops in the patient who suffered from chronic constipation, one should be careful about the perforation. This condition is often seen in the elderly.[8-9] Because the mortality rate is nearly 34%, early diagnosis is very important.[10] CT shows pericolonic stranding, perfusion defect, and dense mucosa, indicators of stercoral perforation, which can help our diagnosis.[11]

It is recommended that doctors evaluate the nutritional status in the critically ill patient because malnutrition can increase the risk surgical site infection.[12] We used Nutritional Risk Screening (NRS 2002) to calculate the scores. For our patient, besides being critically ill, she also had a BMI less than 18.5 and an impaired general condition. Her NRS scores were extremely high, which meant we should start nutrition support at once. A meta-analysis in 2015 of 3525 patients showed that for those with NRS-2002 ≥ 3, the mortality rate is 3.61 times that of the non-nutritional risk group during the perioperative period.[13]

In this patient's early hospitalization, she was given parenteral nutrition (PN) through PICC. However, due to her severe inflammation, she developed a thrombosis and the PICC was removed. We had no choice but to start EN for the patient with definite perforation of digestive tract. Because

the perforation was in the lower part of the ileum, the digestion and absorption function were not affected. For patients with encapsulated perforation, it is safer to receive conservative medical treatment than a surgical procedure because these patients are at high surgical risk.[14]

Choosing the right time and the right internal nutrient state to start EN is essential. It is believed that EN should not be started in the patient with severe hemodynamic instability,[3] intestinal obstruction, gastrointestinal bleeding, high flow fistula, etc. When we decided to start EN, the patient's hemodynamic status was stable, and the bleeding stopped, at least temporarily. She had normal stools and bowel sounds. Therefore, there were no contraindications.

Studies for chronic perforation and EN are rare, but we can learn from other studies. The Crohn's disease (CD) patients with fistulas also have severe inflammatory status and malnutrition, which to some extent are similar to our patient. Two recent studies reported that EN can promote the recovery of the fistulas.[15,16] A total of 48 CD patients underwent exclusively EN treatment for 12 weeks. Successful fistula closure was seen in 62.5% of these patients.[16] EN may also reduce the inflammation in the intestines.[17] It is already recommended as the first line choice in children.[18] We chose to use it in the adult patient with enveloped perforation, which is similar to fistulas.

As there was a perforation at the end of the intestinal tract, we did not want to increase the intestinal burden. Direct absorption with no residue will be better. Peptison is a peptide-based formula and more likely to improve nutritional status and immune function of the intensive care patient.[19]

Each patient has their own character, and although we failed the first time we tried, we succeeded the second time. After the EN treatment, we finally saw that the perforation disappeared in the CT scan.

CONCLUSION

To summarize, we have reported a complicated case that EN played an essential part of the treatment of a 66-year-old patient with gastrointestinal perforation that might have resulted from chronic constipation. EN may play a vital important role even in patients who have perforations in the digestive tract. In addition, chronic constipation may cause the obstruction and perforation, which are rare but may be fatal.

ETHIC APPROVAL

The research was approved by the Ethic Committee of Peking Union Medical College Hospital, Chinese Academy of Medical Science and Peking Union Medical College.

PATIENT CONSENT

Consent was obtained from the patient.

FUNDING

Not applicable

CONFLICT OF INTEREST

All authors declared that they have no conflict of interest.

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