

# PD Combined with Autologous SIT and Resection of Hepatic Nodules—Nursing Care of a Case Who Had a History of Colon Cancer

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**Abstract:** A patient with duodenal and liver metastases was admitted to FAHZU in December, 2019, and was received pancreaticoduodenectomy (PD), autologous small intestine transplantation (SIT), and resection of hepatic nodules. It is notable that he had a history of colon cancer. This article summarizes experience of nursing care, including sufficient preoperative evaluation, professional nursing and psychological support, preventive nursing of postoperative complications, observation of blood supply of transplanted small intestine, nursing of pain, nursing of anticoagulation to prevent thrombosis. The patient recovered well and was discharged smoothly and seamlessly.

**Keywords:** Colon Cancer; Duodenal Tumor; Autologous Small Intestine Transplantation; Nursing Care

The incidence of cancer in China has increased in recent years. Based on the data of 2018, the number of cancer cases in China has increased by 3.804 million, and the number of deaths increased by 2.296 million in 2014. Colorectal cancer, with its incidence rate ranked third, is one of the most common malignant tumors of digestive tract. The duodenum is the most vulnerable organ of colorectal cancer, and is difficult to find in early stage. Once a patient is confirmed, the prognosis is poor and the mortality rate is high. Pancreaticoduodenectomy (PD) is the only way for surgical treatment at present. However, recent studies have shown that invasion and distant metastasis can occur locally in early stage of duodenal malignant tumor. Once the tumor invades mesenteric vessels, it was previously believed that the cancer could not be cured by radical surgery. Otherwise, mesenteric vessels must be severed and combined with vascular reconstruction. PD and autologous SIT were adopted by our hospital to achieve the integrity resection

and radical cure of the tumor. However, due to the complicated operation and large resection range, which involves digestive tract reconstruction and small intestine transplantation, many serious complications are prone to happen. Therefore, providing targeted treatment and nursing care is very important for the recovery of patients. The following is the nursing case study report of a patient who had successfully treated using PD, autologous SIT, and resection of hepatic nodules in December 2019 in our hospital. It is notable that this patient had a history of duodenal and liver tumors.

## 1. Clinical data

### 1.1 General information about patient

The patient is a 56-year-old male. Four years ago, due to abdominal pain, he was confirmed that there was a space occupied lesion on ileocecal site and received

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right hemicolectomy in our hospital. Postoperative pathology: ulcerated moderately differentiated adenocarcinoma. In October 2019, the patient felt pain and discomfort in the upper abdomen with nausea and vomiting, and the vomit was a large amount of gastric content. The gastroscopy showed that there existed chronic non-atrophic gastritis and duodenal stenosis. Besides, pathology showed that there were chronic inflammation of mucous membrane (horizontal biopsy of duodenum), and a small amount of free severe atypical glands, which was consistent with adenocarcinoma. CK (pan) + MR suggested that after colon cancer operation, there were multiple masses and nodules at the root of retroperitoneum and mesentery, which embedded and invaded the descending and horizontal parts of duodenum, and the branches of superior mesenteric vein were invaded. S4 and S8 of liver each had a nodule, and metastasis was considered. Combined with the patient's current and past medical history, multidisciplinary joint diagnosis and treatment (MDT) were needed. Summary: the patient suffered from recurrence of colon cancer after operation, invasion of mesenteric roots and multiple liver metastases.

## 1.2 Treatment and outcome

PD, autologous SIT, resection of hepatic nodules were used on November 2, 2019. During the operation, many hard masses were found at the root of mesentery, which fused with each other, closely adhered to duodenum, pancreatic head and part of small intestine, invading superior mesenteric vein and inferior vena cava. Three hard nodules were found in liver S3, S4b and S7. During the operation, the liver tumor was completely removed, and the small intestine and superior mesenteric artery vein were severed at a distance of 10 cm from the distal end of the original colonic anastomosis, and about 220 cm of small intestine was removed for *in vitro* preserved by 4°C container. After vascular repair, the intestine was transplanted back to the patient. The duration of cold ischemia was 2 hours and 54 minutes, and 30 seconds for the heat ischemia. The end of ileum was pulled to the lower right abdominal wall for ileostomy. The total length of operation lasted 8 hours, and there were 1000 ml of blood loss. The patient was in intensive care unit (ICU) for close monitoring, and then transferred to general ward one week later. Unobstructed mesenteric blood

flow was monitored after operation. Enteral nutrition support was given 10 days later, and the patient was discharged 30 days later. Besides, there was no abnormal discomfort after two weeks, which was learned by the telephone follow-up.

## 2. Key points of nursing care

### 2.1 Preoperative nursing

#### 2.1.1 Dietary care

It is necessary to monitor nutrition-related indicators, and scientifically guide patients to eat vegetables and foods in high protein and calorie at every meal according to the nutritional status of patients. Supplements sufficient liquid is needed, but the patient should avoid eating high fat foods. For those with poor nutritional status, patients are given oral Renang 200MLQD as prescribed by the doctor to improve the nutritional status of patients through enteral and parenteral nutrition.

#### 2.1.2 Psychological nursing

Patients are worried about risks and prognosis of surgery, so there will be different degrees of psychological anxiety. The responsible nurses carry out professional evaluation, supportive nursing screening on patients to evaluate patients' support system and identify their psychological and spiritual needs in time. It is also necessary to strengthen the communication with patients and the prognosis of diseases, and help patients set personal goals to face treatment.

#### 2.1.3 Preoperative preparation

Two weeks before operation, patients need to have standardized low-fat diet, keep stool smooth, and ban smoking and alcohol to improve routine cardiopulmonary function. Examination of blood coagulation, liver and kidney, and detection of four markers of transfusion-related infectious diseases and blood preparation should be carried out. Patients should ban solid food for 6 hours before operation, ban fluid for 2 hours before operation, and make irregular intestinal preparation. Through video and voice education, nurses need to guide patients to take deep breaths and cough effectively, and use digital pain score method (NRS).

### 2.2 Postoperative care

#### 2.2.1 General nursing

Patients should take a supine position after surgery and returning to the ward, and rest in a low half-supine

position after 6 hours, with the bedside shaking 30 degree. ECG monitoring and low-flow oxygen inhalation should be given, and nurses need to monitor the vital signs of patients every 1 hour for 3 to 4 days and help patients get out of bed on the 3rd day after operation. Nurses should effectively fix the drainage tube, keep the abdominal drainage tube unobstructed, avoid folding and compression, and observe the characteristics and color of the drainage tube. Nurses should also use somatostatin according to the doctor's advice, and pay attention to the laboratory indexes, amylase content in drainage fluid, inflammation indexes of patients, and make statistics on the amount of incoming and outgoing in each shift.

### **2.2.2 Related pain nursing**

Research shows that postoperative pain is mainly related to drainage tube stimulation and incision trauma<sup>[1]</sup>, according to the pain management method implemented by Xueli Bai *et al.*, during the perioperative period of pancreatoduodenectomy, our department adopted<sup>[2]</sup> the pain management mode of patient controlled analgesia (PCA). Preemptive analgesia was performed by intravenous injection of BID+ with parecoxib sodium 40 MG and the use of patient-controlled analgesia pump. Nurses need to closely observe the patients' complaints, evaluate the analgesic effect, Ramsay sedation score and adverse drug reactions every 4 hours, and give corresponding nursing measures for the related adverse drug reactions.

### **2.2.3 Nursing care of abdominal hemorrhage**

Abdominal hemorrhage is the most serious complication in early postoperative period, with high mortality. It is mainly related to incomplete hemostasis and coagulation dysfunction during operation in early period, and is caused by pancreatic fistula and biliary fistula corroding blood vessels in late period (one week later). Therefore, it is necessary to closely observe the coagulation function of patients, monitor their vital signs, and monitor the color, character and drainage volume of drainage fluid in abdominal drainage tube. Nurses should also pay attention to patients' complaints, and evaluate patients' abdominal signs and abdominal pain and bloating in each class.

### **2.2.4 Related research on thromboembolism nursing**

Related researchers found that all high-risk factors that cause deep vein thrombosis after operation

formed by the use of hemostatic drugs after operation, the influence of anesthesia and sedatives, the injury of vein wall, the hypercoagulable state of blood and the slow blood flow caused by long-term bed rest<sup>[3]</sup>. Our doctor in charge our department dynamically evaluates the risk level of patients with venous thromboembolism (VTE) according to Caprini evaluation scale, and gives corresponding preventive measures. Activity quantification standard was established according to the patient's specific conditions. The patient was encouraged to turn over in bed after 6 hours after operation. On the first day after operation, the patient was encouraged to rest in a semi-recumbent position. The patient was instructed to exercise in bed walking and ankle pump exercise twice, each time for 10-15 minutes. On the second day, on the basis of the original activities, nurses assisted the patient to rest by bed for 2 times, each time for 10-15 minutes. Three to four days after operation, nurses assisted the patient to walk in the ward, each time for 10-15 minutes. It is advisable for the patient to endure physical strength and not feel tired in each activity. During the activity, the patient's vital signs are closely monitored. If the patient's face turns to pale or cold sweat appears, the activity would be stopped. Patients were instructed to wear graduated compression stockings (GCS) correctly before operation, treated with pneumatic pump during operation, and wore them all the way after operation. The patient would get relaxed for one hour every day, and the indexes of coagulation function and plasma D-dimer were observed dynamically. On the six day after operation, B-ultrasound examination of the neck vessels showed thrombosis around the deep vein indwelling needle in the neck. On the same day, 4000 units of enoxaparin sodium needle were given subcutaneously for anticoagulation every 12 hours. At the same time, the risk of bleeding was evaluated, and whether there was abnormal bleeding in gums and nasal cavity, hematuria and black stool were observed.

### **2.2.5 Nursing care of SIT and stoma**

It is reported that almost 50% of patients with small intestine transplantation will have surgical complications. The most common ones are intestinal anastomotic leakage, bile leakage or hepatic artery thrombosis, abdominal abscess and chylous ascites. Autologous SIT technique is used in our department to avoid postoperative rejection, but nurses still need to pay attention to the blood

supply, function and complications of small intestine transplantation. In the early postoperative period, the patient was examined by B-ultrasound several times to monitor the mesenteric blood flow. At the same time, nurse should pay attention to the recovery of intestinal function, auscultate the bowel sounds every day, and observe the defecation and exhaust of patients. On the second day after surgery, bile-like digestive juice was discharged, and the bowel sounds gradually return to normal. Nurses recorded the excretion condition of patients with stoma in each shift, evaluated the stoma and the surrounding skin every day, and observed the color of stoma, which was pink, indicating good blood supply. Nurses also cleaned and disinfected the stoma on time, washed it with normal saline, applied skin care powder for external application. Two-piece artificial anal bag were selected, with leakage-proof strips locally, which was measured according to the actual size of the stoma and the position of the abdominal incision. Paramedics trimmed the appropriate size, fixed the anal bag as far as possible on the outside to avoid its excrement polluting the incision, and cooperated with the stoma belt to guide the patient to avoid skin friction around the stoma as much as possible. The patients and their families were given colostomy education in the whole process, and the stoma clinic was followed up after discharge.

### **2.2.6 Nutrition care**

According to researches, the nutritional status of patients after surgery is negative correlated with the incidence of postoperative complications<sup>[4]</sup>. The better the nutritional status of patients after operation, the lower the incidence of complications. Anastomotic fistula after small bowel transplantation is a fatal complication. In order to ensure the healing of anastomotic stoma, gastrointestinal decompression and fasting for 7-10 days are needed after operation. Parenteral method is the main way to obtain nutrition for patients before the function of transplanted intestine is restored. A total of nitrogen 0.2g/(kg d) and heat card 105.5kj/(kg d) are daily demand. With the recovery of the function of the transplanted intestine, the method was gradually transitioned to enteral nutrition. Besides, with the increasing amount of enteral nutrition, parenteral nutrition can be gradually decreased. On the 7<sup>th</sup> day after operation, the patients were given enteral nutrition therapy, and the enteral nutritional emulsion (TPF-T) was given 50ML from naso-

intestinal nutrition tube, and gradually increased to 400ML. Therefore, while doing a good job in routine nursing of parenteral nutrition, based on the nursing operation standard of enteral nutrition in our department, the bedside was raised at a speed of 5ML/H. Every 4 hours, patients were evaluated for intestinal nutrition intolerance, such as diarrhea and abdominal distension. According to patients' symptoms, appropriate adjustments were made to gradually increase the infusion speed to the patient tolerance value.

### **2.2.7 Nursing of pancreatic fistula and biliary fistula**

Pancreatic fistula is the most serious complication after operation, with a high incidence, often around 3% ~ 45%<sup>[5]</sup>. Its main reasons include disease types, pancreas's own texture, patients nutritional status and surgical anastomosis methods. The occurrence of biliary fistula is related to the blood supply of anastomosis, the degree of dilatation of bile duct and whether the wall is fibrotic and thickened<sup>[6]</sup>. To keep the drainage tube unobstructed, the color, character and quantity of drainage tube should be closely observed after operation. The abdominal signs of patients were observed in time, and the amylase in drainage fluid was continuously detected for 3 days on the third day after operation, and the indexes were all in normal range. Besides, there was no bile-like liquid in the drainage tube. The application of somatostatin can reduce the secretion of pancreatic juice and help the healing of anastomotic stoma. Moreover, to ensure the effectiveness and continuity, drugs should be prepared and used when they are available.

### **2.2.8 Nursing care of gastric emptying disorder**

Gastric emptying disorder is a common complication after operation, which may be related to pacemaker of PD, surgical stress, anastomotic edema, hypoproteinemia, massive pancreatic juice bile reflux and other factors<sup>[7]</sup>. The patient developed gastric emptying disorder on the 15<sup>th</sup> day after operation, and the gastric juice drainage volume was nearly 800 ml per day, complaining of obvious abdominal distension. The upper gastrointestinal radiography suggested that there was reflux of gastroparesis and gastrojejunostomy. The patient was encouraged and assisted to get out of bed, to use drugs to promote gastrointestinal peristalsis, and combine acupuncture and acupoint therapy in the later stage. After 28

days, the patient recovered his gastrointestinal motility and ate orally.

### 3. Conclusion

With the continuous developing of surgical techniques, the resection rate of tumors has been effectively improved by improving the surgical methods and expanding the scope of resection. Meanwhile, the survival rate of patients' prognosis has been improved<sup>[8]</sup>. Our hospital adopted PD combined with autologous SIT method to achieve radical resection effect. However, the operation is difficult and risky, and nurses should give patients full preoperative care as well as preventive care for postoperative complications. Nurses should also have close observation of blood supply of transplanted small intestine, nutrition intervention in early stage. Both of the management of pain and prevention of thrombosis are critical. However, there are limited researches of relevant cases at present, because of the lack of such operations. Besides, the long-term nutritional problems after operation of patients still need further studies and exploration. Therefore, nursing practice needs to be improved in future.

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