

New Progress in Nursing for Early Enteral Nutrition after Esophageal Carcinoma Surgery

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ABSTRACT Esophageal carcinoma drains the body, and its surgery causes dramatic trauma. After operation, patients must abstain from food. The body experiences negative nitrogen balance for a long time after operation due to fever, stress and loss of body fluids as well as digestive juices. Hence, nutritional support appears to be extremely important. Nurses needed to pay more attention in solving the problem of post-operative malnutrition.

KEYWORDS

Esophageal carcinoma
Early enteral nutrition
Nursing care

1. Introduction

Esophageal carcinoma is a common cancerous tumour on the human body, accounting for 90% of esophageal tumours. In the retrospective survey on all deaths caused by cancerous tumours, it is the second killer only after stomach cancer. As estimated, about 200,000 people are killed by esophageal carcinoma around the world every year, so it is one of the commonest cancerous tumours extremely harmful to the life and health of people.

2. Factors inducing esophageal carcinoma

The etiological study of esophageal carcinoma has revealed several commonest factors as follows:

2.1. Cigarette and liquor

Long-term smoking and drinking are related to the incidence of esophageal carcinoma.

2.2. Local damage to esophagus

Eating hot foods for a long time may be also a factor inducing the cancer. Lasting esophagitis caused for various reasons may result in the precancerous lesion of esophageal carcinoma. Especially, a patient with appearance of anaplastic cells may experience higher possibility of can-

cer. Esophagitis also happens to esophagus in the center of chest more often.

2.3. Nitrosamine

Nitrosamine compound is a very strong carcinogen. The quantity of pickles eaten by patients is positively correlated with the incidence of esophageal carcinoma. Some foods may often be contaminated with fungi during pickling. The fungi may increase the content of nitrite and secondary amine in foods.

2.4. Effect of fungus

The fungi in foods, including *Alternaria* and *Aspergillus flavus*, are severe carcinogens.

2.5. Nutrients and trace elements

The lack of vitamins, proteins, necessary fatty acid and other elements in meals may cause the mucosal hyperplasia or anaplastic cells in esophagus, which may further develop into cancer.

2.6. Genetic factors

People's vulnerability to cancer was related to genetic and environmental condition.

2.7. Other factor

Eating too fast, coarse and hard foods may damage mucosa of esophagus, and repeated damage may result in mucosal hyperplasia or anaplastic cells, resulting in cancer.

3. Nutritional Supports

3.1. Enteral nutrition

It refers to the feeding of nutrient solutions through nasal-

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gastric tubes, nasal duodenal tube, stomach stoma or inserted intestinal fistula.

3.2. Contraindications

Babies of below three months old, and patients with intestinal obstruction, massive hemorrhage of upper gastrointestinal tract, severe malabsorption syndrome, intra-abdominal infection, short bowel syndrome and entire rest of intestines. The decrease of peristaltic sound is not a contraindication of enteral nutrition.

3.3. Advantages

(1) Nutrients are absorbed by portal system and transmitted to liver, facilitating the protein synthesis and metabolic regulation of internal organs; (2) Long-term parenteral nutrition may deteriorate the activity of enzyme system in the mucosa of the intestines, while enteral nutrition may improve and maintain the structure and integrity of mucous cells of the intestines, so as to prevent the movement of bacteria in the intestines; (3) During parenteral nutrition, the metabolism of body needs more energy. For consuming the same quantity of calories and nitrogen, the patients with enteral nutrition can have better weight gain and nitrogen storage than those with parenteral nutrition; (4) Enteral nutrition has low requirements for technology and equipment, and its cost only 1/10 of that needed by parenteral nutrition [1].

3.4. Implementation of enteral nutrition

After anastomosis is completed in operation, the duodenum feeding catheter (with guide wire) is inserted slowly and pushed below the descending part of duodenum through pylorus, and then guide wire is dragged out to fix the catheter. On the morning of the first day after operation, 500–1,000 mL saline solution is dropped into duodenum feeding catheter. If the patient does not feel uncomfortable, 500 mL milk will be dropped in. On the second day after operation, 1,500 mL nutrient solution will be added, while 2,500–3,000 mL will be dropped in on the third day after operation. Nutrient solution mainly consists of milk together with broth, vegetable soup, juice and rice soup, etc. It is suitable to have the mass concentration of lower than 10% and the temperature of 37–40 °C. A patient can have liquid foods through mouth 8–10 days after operation. If a patient has no anastomosis fistula, duodenum feeding catheter is removed. If a patient has anastomosis fistula, duodenum feeding catheter can be removed after the fistula heals [2].

4. Measures and Nursing

4.1. Common nursing

The air in ward is kept fresh. The visitors are strictly controlled to reduce the flow of people. Attention is paid to air flow, in order to reduce the infection of respiratory tract. Patients are encouraged to blow balloons, in order to im-

prove the function of lungs [3].

4.2. Psychological nursing

Nurses should often communicate with patients to learn about their physiological and psychological reactions and obtain their cooperation. Attention should be paid to preventing patients from removing the feeding catheter due to uncomfortable feelings. During infusion, nurses should pay close attention to check whether patients experience stomachache, abdominal distension, diarrhea, nausea, number of bowel movements, quantity and quality of stools. If a patient has any uncomfortable feeling, nurses should explain about it to the patient, console the patient and actively help deal with it [4].

4.3. Catheter nursing

Duodenum feeding catheter should be fixed properly, and adhesive tape should be replaced periodically, in order to guarantee its continuity and stability. The gastric tube and duodenum feeding catheter should be fixed separately, in order to prevent removal of gastric tube from dragging out feeding catheter. The smoothness of abdominal drain should be guaranteed. The colour and nature of drainage fluid should be observed, and the drainage fluid should be measured accurately, in order to guide the adjustment of nutrients in the intestines [5].

4.4. Nasal Feeding

The nursing for nasal feeding should start with low volume and slow feeding. A little warm saline solution can be fed to facilitate the intestinal adaptation, and the feeding volume is increased gradually. The temperature is 30~40 °C.

4.5. Keeping body position

When a patient returns to the ward after the operation, the patient is placed in a horizontal position with thin pillow under the head for 6 h (the pillow is 4~6 cm thick after the patient lies down), and faces the head one side. If the patient is clear-minded, after lying on his back for 6 h, the patient can lie on his left and right sides every 2 h. On the first day after operation, the patient can half sit up. If nutrient solution is infused when the patient lies on his back, the head of the patient should be raised by 30~45 degrees. After infusion, the patient keeps the position for 30~60 min, in order to prevent backflow from causing aspiration by mistake. Meanwhile, it can prevent backflow from causing cough and loosening gastric tube and nasal intestinal feeding catheter [6,7].

4.6. Handling gastroenteric reactions

During the implementation of enteral nutrition, gastroenteric reactions may occur, mainly including nausea, vomit, abdominal distension, diarrhea and intestinal spasm, etc. The reasons include: (1) Too much and fast infusion makes intestines unable to digest and absorb in a timely manner;

(2) Contamination happens during infusion; (3) The temperature of nutrient solution is too low, irritating intestines and speeding up peristalsis; (4) Nutrient solution has too high fat content, resulting in fat droplets. All these factors may affect the patient's tolerance and result in adverse complications. Therefore, observation and patrol should be strengthened during infusion, in order to control the total volume, speed and temperature of infusion [8].

4.7. Strengthening nursing for respiratory tract.

After esophageal carcinoma surgery, patients may suffer from different degrees of difficulty in breathing due to the pain in chest and abdomen or pressure on lungs as stomach is pushed into thoracic cavity. Therefore, patients must receive oxygen inhalation 1~3 days after operation. During oxygen inhalation, the oxygen flow should be regulated based on the breath of patient and the degree of hypoxia, which is normally 2~3 L/min. If the oxygen flow is increased to 3~5 L/min, a patient can still feel chest tightness and difficulty in breathing, and his degree of blood oxygen saturation is below 98%. Then, it is necessary to check whether the closed drainage tube of thoracic cavity is kept smooth. Under such circumstance, it should be immediately reported to the doctor and the chest X-ray should be conducted to find out whether gaseous exchange may be obstructed in pleural effusion or spontaneous pneumothorax occurs after esophageal carcinoma surgery. When any patient who smokes or has respiratory illness experiences excess production of thick sputum, pain at cuts and fears cough after operation, aspiration of sputum and aerosol inhalation should be periodically conducted for the patient, in order to prevent pulmonary infection [9].

4.8. Importance of abdominal drain tube to patients with esophageal carcinoma.

After esophageal carcinoma surgery, the junction between esophagus and stomach is sectioned, so the internal pressure of digestive tract will increase due to late exhaust after operation and blocked abdominal drain tube. In addition, the negative pressure in chest thoracic cavity may easily expand the anastomotic stoma or widen the fracture, so the contents overflow into the tissue space of anastomotic stoma, resulting in local tissue infection and then fistula. Therefore, gastric tube must be properly fixed after operation, and close attention should be paid to observing the quantity and nature of drainage fluid. If necessary, sterilized saline solution is used to flush gastric tube under low pressure, so as to ensure the smoothness of abdominal drain tube and reduce the incidence of anastomosis fistula. Gastric tube must be inserted to the depth of 55~68 cm to guarantee that the end holes and side holes of gastric tube locate at the middle and lower parts of stomach, in order to ensure sufficient drainage. Also, this can increase the drain flow of gastric juice and alleviate the abdominal distention. Abdominal drain tube plays an im-

portant role in preventing the occurrence of anastomosis fistula. Meanwhile, it can reduce the pressure of stomach on lungs inside the chest, so as to prevent pulmonary complications [10].

4.9. Observation of vital signs

The senses and facial expressions of patients are closely observed. Electrocardiographic and oxygen saturation monitoring should be carried out to closely observe the changes of blood pressure and pulse till they are stable. The body temperature is monitored and measured every 4 hours. The body may show mild fever under the stress of operation, and restore to the normal temperature 3 days later. If a patient experiences severe fever and chills, etc., attention should be paid to some complications, e.g. infection and anastomosis fistula [11].

5. Prevention of complications

(1) Fluid and electrolyte disorders: Infuse sufficient fluid, closely monitor the change of fluid and electrolyte and the inflow and outflow. (2) Blood sugar disorder: Monitor the blood sugar at the end of the whole process, and adjust the content of sugar or take injection of insulin based on the level of blood sugar. (3) Aspiration pneumonia: As the head of the bed is too high at 30~45 degrees, if a patient experiences faster heart rate, increase of body temperature and spitting of foamy sputum that is not thick, the possibility of aspiration pneumonia should be taken into account, and dripping infusion should be stopped. The condition should be reported to the doctor [12].

6. Prevention of esophageal carcinoma

The prevention of esophageal carcinoma is undoubtedly the basic measure for control of esophageal carcinoma. The effective preventive measures against esophageal carcinoma include protecting esophagus, refusing carcinogenic foods, having rational diets, taking preventive medicine and actively taking medical treatment for esophageal diseases [13].

7. Conclusion

Patients with esophageal carcinoma experience different degrees of difficulty in eating, and the tumour speeds up their metabolism, so they show different degrees of malnutrition. Thus, it is necessary to rectify the imbalance of electrolyte and acid-base equilibrium in body, prevent the blockage of nasal feeding catheter and avoid diarrhea and insufficient enteral feeding of nutrients. Moreover, patients should half lie down, periodically test the remaining fluid, prevent aspiration by mistake and backflow, and accurately record the inflow and outflow of fluid. Above all, reasonable enteral nutrition in early stages plays an important role in helping patients maintain good nutritional situation, preventing and reducing complications, improving the resistance of patients, shortening the dura-

tion of hospitalization and lowering the cost of hospitalization.

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