



## ARTICLE

# Lead to Elevate the Temperature and Speed of Emergency Rescue and Nursing Care of Common Carotid Artery Rupture and Massive Hemorrhage after Operation of Typical Esophageal Cancer

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### ABSTRACT

**Objective:** Objective To explore the first aid and nursing of patients with anastomotic fistula after radical resection of esophagus carcinoma complicated with major carotid hemorrhage. **Methods:** The clinical data of anastomotic fistula complicated with carotid artery rupture and massive hemorrhage after radical resection of typical esophageal carcinoma were analyzed and summarized. **Results:** Through the close cooperation of medical care, the rescue was successful. **Conclusion:** Earlier prevention observation, raising first aid consciousness and actively cooperating with doctors can improve the success rate of rescue.

## 1. Introduction

Esophageal cancer is one of primary malignant tumors in our country, "Global Cancer Statistics 2018" showed esophageal malignant tumor is east Asian characteristics, China accounts for more than 50% of new cases each year<sup>[1]</sup>. The latest figures show 2019 esophageal cancer is one of the major cancer in our country is located in the top five, Incidence as high as 6.26%, Mortality rate as high as 8.04%. At present, the treatment of esophageal cancer is mainly based on operation, combined with radiotherapy and

chemotherapy<sup>[2]</sup>. Anastomotic fistula is one of the most serious complications after esophageal cancer operation. The incidence rate of anastomotic fistula after esophageal cancer operation range from 8% to 24%, and the mortality rate is 11.0% to 35.7%<sup>[3]</sup>. The incidence of intrathoracic anastomotic leakage was 3% to 5%, and that of cervical anastomotic leakage was 5% to 14%<sup>[4]</sup>. Carotid artery rupture caused by anastomotic fistula is a kind of rare but extremely dangerous emergency. Rescue can save the patient's life in time, which can easily lead to hemiplegia or even death.

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In November 2019, our department admitted a case of carotid rupture and massive hemorrhage caused by anastomotic fistula in 52 days after operation for esophageal cancer. Summarized the nursing of anastomotic fistula and rescue experience of common carotid artery rupture and hemorrhage for esophageal cancer, improved rescue success rate and reduced mortality rate. The nursing experience is reported as follows:

## 2. Clinical Data

Male, 54 years old, with concurrent radiochemotherapy for esophageal mid - thoracic squamous cell carcinoma (radiotherapy was started in August 2019, with a total of 22f radiotherapy dose: 95%PGTV 47.3Gy/2.15Gy/22f, PTV 39.6Gy/1.8Gy/22f; During one cycle of simultaneous chemotherapy with capecitabine plus nedaplatin, capecitabine 1500 mg/m<sup>2</sup>, nedaplatin 25 mg/m<sup>2</sup> q1w<sup>2</sup>), Checked in to our department in November 2019 for surgical treatment. “Thoracoscopic combined three - incision esophageal cancer resection by gastric replacement esophagocervical anastomosis” under general anesthesia on November 26,2019, following a complete assessment of the relevant examination, On day 8, the neck incision was red and swollen, The results of endoscopy showed that the anastomotic stoma was in deep depression and the diagnosis of cervical anastomotic stoma fistula. the neck wound is opened and the fistula bag is connected with a negative pressure bottle to be fully drained, a large amount of pyrogenetic odor secretion is led out, and 50ml of metronidazole is continuously washed and changed, and the secretion is cultured into pseudomonas aeruginosa and oral streptococcus. Amikacin + vancomycin anti-infection treatment according to drug sensitivity, supplementing nutritional support such as albumin, high vigilance for anastomotic abscess erosion of neck blood vessels, Post-operative day 52, After severe coughing, the common carotid artery ruptured and hemorrhaged during medical ward rounds, electrocardiogram monitoring, high-flow oxygen inhalation, establishment of double venous pathway, intravenous drip of pituitrin, methylprednone and Ringer’s fluid, the bedside trachea is incised and the trachea intubation is indwelled and the continuous breathing balloon is used for assisting breathing and removing blood clots, After being signed by the family, the emergency general anesthesia was immediately sent to the operating room for “exploratory disconnection of the left common carotid artery of the median splitting sternum + cervical esophagus fistula + thoracic gastric fistula + debridement and drainage” and transferred to ICU for treatment after the operation.

## 3. Rescue Preparation

(1) Item preparation. For patients with long-term anastomotic fistula non-healing and increased fluid leakage, prepare for bleeding rescue. Negative pressure aspirator, oxygen, shadowless lamp, tracheotomy bag, tracheal intubation box (containing respiratory balloon, laryngoscope, tracheal intubation belt air bag, intubation tube core), first aid medicine, etc. should be provided beside the bed. And make sure it’s in good condition in case of urgent need.

(2) Judging whether it is carotid bleeding is the key to rescue. The carotid artery hemorrhage is turbulent and manifested as a large amount of blood gushing out from the nasal cavity, mouth, airway and wound. Once the carotid artery hemorrhage is diagnosed, the first means of rescue is to press and stop the bleeding, the method is as follows: opening the wound, Directly place your fingers on the artery (preferably on the upper and lower ends of the hemorrhagic site) for compression, with the best force to block blood flow, and avoid pressing the trachea too hard to affect breathing.

(3) Keep the airway unobstructed and prevent asphyxiation: assist the patient to take the side lying position of the patient with one side of the head to help the blood lead out, encourage the patient to cough up the blood at any time without force, tell the patient to maintain the normal breathing frequency not to hold breath, Prepare tongue depressor, mouth opener, aspirator, etc. If blood clot still cannot be discharged, use suction tube to aspirate, and prepare and explain the items for tracheotomy or tracheal intubation.

(4) Assisting tracheotomy: assisting the patient to take the supine position, raising the shoulder by about 10cm, making the head as far back as possible, facilitating exposure of the trachea, selecting a suitable low-pressure air-bag catheter according to the age and body type of the patient, generally selecting a catheter of 7.5-8mm for adults, the nurse stands on the left side of the patient, holds a sputum suction tube to clean the blood of the operation field and blood clots of the oral and nasal cavity at any time, puts the tracheal cannula into the trachea after the tracheal incision, inflates the catheter air sac, the suction tube is inserted into the trachea through the trachea to absorb the blood clots, Connect the respiratory balloon to continuously positive pressure ventilation, the tracheal sleeve is fixed to the neck by a lace, elastic to extend into 1 finger is appropriate, a piece of vaseline gauze is plugged under the skin to stop bleeding, and two pieces of open gauze are used between the wound and the sleeve <sup>[5]</sup>.

(5) Closely observe the changes of vital signs, state of consciousness, complexion, temperature of limbs, urinary

volume, ECG monitoring, high-flow oxygen uptake, keep warm.

(6) Establish more than 2 venous channels, apply hemostasis, replenish blood volume, boost blood pressure, vasoactive drugs, draw cross-match blood, inform blood bank to prepare blood. Prepare oil gauze, gauze, gauze wet with adrenaline to give compression hemostasis, contact the operating room, anesthesiology department, ICU to prepare.

(7) Do a good psychological care, comfort patients and family members, tell them not to be nervous, cooperate with rescue.

## 4. Discussion

### 4.1 Cause Analysis of Bleeding

(1) The left side of the common carotid artery originates from the aortic arch, the anterior lower segment of the common carotid artery is covered by the sternocleidomastoid muscle, the medial side is adjacent to the esophagus, the trachea, the larynx and the thyroid, and the anterior edge of the sternocleidomastoid muscle is cut in the neck for radical esophagectomy, Cut the skin subcutaneous tissue and platysma muscle, draw the sternocleidomastoid muscle and the cervical vascular sheath outwards, cut the esophagus in the neck, lift the tubular gastric autoesophageal bed to the neck, and perform mechanical anastomosis with the normal esophagus in the neck<sup>[6]</sup>. Postoperative cervical anastomotic fistula may result in prolonged immersion of the carotid artery in saliva, gastric juice or a large amount of exudate, and continued erosion of the artery wall.

(2) Preoperative radiochemotherapy significantly increased the incidence of local tissue dysfunction, wound infection, tissue necrosis and anastomotic fistula. At the same time, radiotherapy also directly damaged arteries, leading to thrombosis and atherosclerosis, which significantly reduced the intensity of arterial wall<sup>[7]</sup>.

(3) Due to the consumption of diseases, surgical trauma, postoperative fasting, nutritional insufficiency, increased metabolic consumption, poor vascular condition and inadequate peripheral fluid, the malnourishment of tumor patients resulted in malnutrition, which was not conducive to the healing of anastomotic fistula.

### 4.2 Prevention of Bbleeding

Long-term erosion of carotid artery by anastomotic fistula is the main cause of hemorrhage, and the causes of anastomotic fistula are complex, which are related to operation, operation, gastric stump and esophageal blood circulation, thoracic infection and systemic nutritional support<sup>[8]</sup>. Ear-

ly improvement of nutritional status, prevention of infection and constipation, promote the healing of anastomosis is of great significance to prevent carotid hemorrhage<sup>[9]</sup>.

(1) Nutritional support: Esophageal cancer belongs to the cancer types with the highest risk for weight loss and malnutrition, Malnutrition is defined as a state resulting from lack of intake or uptake of nutrition that leads to altered body composition (decreased fat free mass) and body cell mass leading to diminished physical and mental function and impaired clinical outcome. In cancer patients malnutrition is due to cancer cachexia, which can be defined as a multifactorial syndrome characterized by an ongoing loss of skeletal muscle mass (with or without loss of fat mass) that cannot be fully reversed by conventional nutritional support and leads to progressive functional impairment<sup>[10]</sup>.

Before esophageal cancer surgery, this patient had 3 points of NRS2002 (nutritional screening risk), nutritional risk, "drinking water test" grade 3, mild dysphagia, and required nutritional support treatment. carrying out nutrition education on patients, guiding patients to eat semi-liquid or liquid diet, avoiding rough and irritating food, eating more fresh vegetables and fruits, taking enough fish, poultry, eggs, milk, beans and the like, Oral or nasal feeding ONS (oral nutrition supplement): 400g of enteral nutrition powder per day; Intravenous infusion of glucose, fat emulsion, amino acids and other nutrients. Patients are encouraged to do training such as climbing stairs to support muscle mass, body function and metabolic patterns<sup>[10]</sup>. Patients with postoperative NRS2002 score of parenteral nutrition or nasal feeding should be combined with ONS, adopt the principle of step by step according to the patient's tolerance, a small amount of multi-meal, select soft, moderate temperature, easy to digest food.

(2) Prevention of infection: Because esophagus cancer radical operation trauma, patients fear pain dare not expel sputum, and oral fasting is very easy to breed bacteria, so it is easy to appear in perioperative period wound infection and so on.

(a) Preoperative respiratory training should be given to patients: such as lip retraction breathing and abdominal breathing training, teaching patients effective coughing and coughing methods. No smoking, no alcohol, long-term smokers before surgery to give aerosol inhalation to promote the dilution and discharge of sputum. The patient was instructed to clean the body before surgery. Patients with oral diseases should be actively treated, patients should be instructed to maintain oral cleanliness, after three meals brushing teeth or chlorhexidine gargle, pre-operation teeth cleaning conditions.

(b) The vital signs, especially the changes of body temperature, should be closely observed after the operation, and all kinds of laboratory tests should be done regularly. Assist the patient to take half lying position after anesthesia, regularly assist the patient to turn over and knock back, guide the patient to breathe deeply and cough effectively, and guide the patient to press the neck and chest wounds with both hands when coughing, which is beneficial to the discharge of the patient's sputum. At the same time, the patient should avoid repeated severe coughing so as not to affect the healing of the anastomosis. After the operation, the chest tube, neck drainage tube and gastric tube are regularly squeezed to maintain negative pressure, and the anti-reflux drainage bottle is regularly replaced to keep the wound clean and dry, and the wound dressing is promptly replaced when there is seepage. Early postoperative use of antibiotics intravenous drip, according to the sputum culture results timely replacement of antibiotics. Keep the ward environment clean and ventilate for half an hour in the morning and evening to assist patients to do basic nursing. When the patient is assessed to be able to eat, instruct the patient to chew the method 50 times and chew the food sufficiently before being swallowed.

(3) Atomized inhalation: Carotid arteries are very sensitive to changes in blood pressure<sup>[9]</sup>. Respiratory secretions can stimulate the throat to cause a patient to cough violently, leading to changes in blood pressure, humidification of the airway and aerosol inhalation help to dilute sputum, relieve symptoms of a patient's violent cough, and guide the patient to press a neck wound when coughing. Avoid increased anastomotic tension.

(4) Observation and nursing of cervical anastomotic fistula: Early anastomotic fistula occurs within 5 days after operation, the symptoms of the whole body are not obvious, palpation can find gas and liquid in neck incision; Mid-stage anastomotic fistula occurred in 6-14 days and was characterized by neck swelling and hot pain, palpation of subcutaneous emphysema and secretion of acid-odorous pus from neck incision; late anastomotic fistula occurred in more than 14 days and was characterized by systemic poisoning and increased pus. Nursing staff should pay attention to observation. The skin flap observation chart should be used to record the color, capillary filling degree and skin temperature in detail. If local skin is obviously white, swollen and skin temperature rise, patients feel local tension<sup>[9]</sup>. Report to the doctor as early as possible and improve the relevant examination so as to detect anastomotic fistula as early as possible. The patient has a mid-stage anastomotic fistula on the 8th day after operation. Diet should be immediately banned, neck incision is open and drained, effective gastrointestinal decom-

pression is maintained, and gastric fluid gas is adequately drained, reducing the tension of anastomotic mouth and promoting the healing of the anastomotic mouth; Use high dose antibiotics to control infection according to drug sensitivity results; give high nutritional support to the veins or jejunum according to doctor's advice to enhance resistance and promote fistula healing; give systemic support treatment such as blood transfusion and transfusion according to doctor's advice; Strengthen the observation of vital signs and draining fluid traits; listen carefully to the patient's complaints and make psychological comfort; assist the patient to do basic nursing such as oral and perineal care; keep the ward quiet and proper temperature and humidity<sup>[11]</sup>.

(5) Sufficient drainage of anastomosis: neck anastomosis close to the surface skin, easier drainage than thoracic fistula, anastomosis local inflammatory exudation more, so it is necessary to give local adequate drainage after neck surgery. After the anastomosis between the stomach and the esophagus, the gastric tube and the feeding tube are retained. The stump of the stomach wall is closed. a rubber strip is used for drainage at the neck, the rubber strip is removed and replaced with a gauze strip after 2 to 3 days, the neck is provided with 1cm open drainage for 2 to 3 days under the condition of ensuring smooth drainage at the neck, and the gauze strip is removed after the neck incision is completely cleaned, The neck incision was given about 2 days of healing time. Helps reduce the occurrence of neck anastomotic fistula and infection<sup>[12]</sup>.

(6) Patients have few signs before their carotid arteries are about to rupture, including severe pain behind the sternum or in the upper abdomen, pulsating wounds, distended arteries, occasional small "harbingers" bleeding, the need for nurses to focus on high - risk patients, and their warning of bleeding signals<sup>[8]</sup>. If the doctor discovers the carotid artery is exposed when changing dressings, the arteries can be ligated before bleeding to prevent the occurrence of major bleeding.

(7) Equipped with a carotid artery rupture emergency treatment box, (Contains respiratory balloon, wound dressing, goggles, face screen, negative pressure device, oxygen inhalation device, air cut bag, with air bag catheter, intubation tube core, physiological saline, syringe, gloves, sedative drugs, local anesthesia drugs, gloves, etc.)<sup>[9]</sup>, Periodically check the service life of the equipment, replace the equipment and stock if necessary, the ward should have the emergency plan of carotid rupture and drill smoothly.

## 5. Summary

Effective preventive observation is of great significance

for early diagnosis of anastomotic fistula. In this case, due to preoperative radiotherapy and chemotherapy, malnutrition, neck anastomotic fistula after operation, pus infiltration and erosion of common carotid artery for a long time leading to massive hemorrhage, therefore, for esophageal cancer surgery patients, nutrition should be strengthened before operation to control infection, Strengthen basic nursing, pipeline nursing and early nutrition support after operation, discover anastomotic fistula in time and take care of it, pay attention to the precursors before bleeding, discover early and deal with it as soon as possible, and actively prepare for rescue. Familiarize and rehearse the emergency plan of carotid artery hemorrhage in advance, cooperate with the doctor actively, need the cooperation of multiple departments when rescuing the hemorrhage patient, should emphasize the team spirit between departments to make the patient recover early.

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