

Nursing Care of Patient with Esophageal Nitinol Stent and Iodine-125 Seeds for Advanced Carcinoma of Esophagus

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Background information:

The esophageal cancer is one of the most common diseases in China. 80% of the patients were middle and advanced stage when they got diagnosed. The implantation of esophageal stents is an effective way to solve the dysphagia of those who were middle and advanced stage esophageal cancer. It can relieve the dysphagia but has a high incidence rate of restenosis because the tumor cells can not be killed, therefore this therapy can only be a kind of palliative care. The Iodine 125 seeds are obviously effective in treating the late stage esophageal cancer. Therefore we loaded the I125 seeds in the Nitinol stent in treating the advanced stage esophageal cancer and took the nursing care of the patients to observe the effectiveness of the I125 seeds nitinol esophageal stent.

【 Abstract 】

Objective

To conclude the clinical experiences of nursing patients before and after esophageal nitinol stent and Iodine-125 seeds implantation.

Methods

The implantation of esophageal nitinol stent with Iodine-125 seeds was performed in 6 patients with advanced stage of esophageal carcinoma. Rational nursing strategies, including psychological direction, routine treatment and rehabilitation guidance, etc., were adopted in pre-operation period.

Results

The esophagus of all the 6 patients were obstructed, and success rate of the implantation was 100%. The fearfulness and uncomfortable feelings of the patients during operation were relieved. No significant complications appeared during following up. The QOL of all the patients were improved.

Conclusion

Rational nursing makes the implantation of esophageal stent accepted easily and performed successfully, and can decrease the adverse reactions to some extent.

【 Key words 】

Iodine-125 seeds; Esophageal carcinoma; Stent; Nursing

The esophageal cancer is one of the most common diseases in China. 80% of the patients were middle and advanced stage when they got diagnosed. The implantation of esophageal stents is an effective way to solve the dysphagia of those who were in middle and advanced stage esophageal cancer. It can relieve the dysphagia but has a high incidence rate of restenosis because the tumor cells can not be killed, therefore this therapy can only be a kind of palliative care. The Iodine 125 seeds are obviously effective in treating the late stage esophageal cancer. Therefore we loaded the I¹²⁵ seeds in the Nitinol stent in treating the advanced stage esophageal cancer and taking care of the patients to observe the effectiveness of the I¹²⁵ seeds nitinol esophageal stent.

Material and Method

1.1 Material

There were 6 patients in this group, all male, 62 to 79 years old, averaging 69.5. Their course of disease ranged from 2 to 11 months, with an average course of disease 6.5 months. All of them were malignant esophageal neoplasm and one was carcinoma of esophago cardia. And their cancers were pathologically diagnosed as moderately differentiated squamous carcinoma. All the patients visited the doctor because of dysphagia. 2 of them could take fluid food and 2 of them semi fluid food. All of the patients took Barium fluid examination or endoscopy to confirm the position, degree, range, shape of stricture as well as whether the patients had tracheoesophageal fistula.

1.2 Method

1.2.1 The Preoperative Preparation

The Preoperative Preparation: The patients had fasting for 12 hours. 30 minutes before operation, they accepted 10mg sedative agent, 10mg 654-2 and 50-100mg Dolantin by intramuscular injection. Also they took the 20 g/L lidocaine as the spraying anesthesia in the larynx. The devices used were endoscope, smooth guide wire, Savary expanding tube and trachea cannula, electrocardiogram monitor, defibrillator, oxygen apparatus, sputum aspirator or other salvage devices, ^{125}I nitinol stent (Micro-Tech Nanjing, Co., Ltd.). The ^{125}I seed was the radioactive source sealed in the peptide sheath 0.8mm in diameter and 4.5mm in length. And the ray emitted reached 1.70cm and 2.0 cm, the half life of the seed was 2 months. The stent was 4cm longer than the stricture and the seeds were put according to different extents of disease. Technical staff loaded the ^{125}I seeds in the stent. Firstly the layers of the seeds were confirmed. Generally speaking, one layer of ^{125}I seeds would be loaded per 1.5cm long in the stent, e.g., if the diseased region is 5cm long, 4 layers of ^{125}I seeds would be put (with 1 layer on each end and 2 layers in the middle part, 4 layers in all to assure the total covering of diseased region). Each layer consisted of 4 ^{125}I seeds and they were put at an angle of 120° . Each three ^{125}I seeds in the nearby 2 layers were interleaved. The procedure of deploying the ^{125}I seeds was the same as deploying the normal stent.

1.2.2 Nursing

Preoperative Nursing

- 1) The patients had fears of different degrees. The primary nurse tried patient persuasion and clearly explained the aim and advantages of the operations. The nurse told the patient that this operation was microinvasive and caused little pain, it can improve the symptom and carry on the radiotherapy at the same time. It's important to tell the patients about the operating procedures as well as the cooperative methods during operation to boost the patient's confidence and ask him/her to keep a good attitude.
- 2) We told the patient to clean the oral cavity, brush his/her teeth before operation, gargle after taking food and give the patient diet guide, i.e., to take the high-calorie, high protein and light food. The patient in poor physical condition received parenteral nutrition therapy to strengthen his/her physique and surgical tolerance.
- 3) We informed the patient and family about the safety of the operation to lay their doubts and told them the

postoperative matters need attention: the people esp. the pregnant woman and child should keep at least 1m away from the patient until 2 months after operation. Cooperation during operation: The operator should assume the length of the stricture according to the scale difference of the endoscope, and the length of the stent should be 4 cm longer than the stricture. The assistant inserts the guide wire into the stricture through endoscope. The assistant slowly extends the guide wire while carefully remove the endoscope to assure the guide wire always being under stricture. The preloaded stent delivery system is inserted along guide wire until the desired position is achieved. Then we release the stent, remove the delivery system and guide wire. We endoscopically inspect the stent to check if its position is correct. If necessary, we adjust its position by foreign body forceps until the desired position is achieved. We pay special attention to the changes of the patient's pulse and breathing and ask the patient to relax, adjust his/her posture and clean his/her oral secretion. The patient with severe coronary heart disease should be monitored of heart rate and taken care of his/her heart rate, cardiac rhythm and blood pressure. After operation, the cold food is forbidden to avoid the stent migration ^[6]; patients should be instructed to take lukewarm fluid or semifluid food 1 hour after operation. And the patient can take soft food 4 hours after operation according to their situation. The patient should chew his/her food well, or to eat soft or pureed food ^[7]. After meal, the patient can take lukewarm water to flush away the food accumulated on the stent. Otherwise the food blockage may cause the doubts of the patient, which may be harmful to the treatment. The patient should keep upright position when taking food. Therefore the food can pass the stricture under action of gravity as well as the esophageal peristalsis. The proper food and posture may effectively avoid the food remaining in the stent. Because the esophageal stent cannot contract by itself, the food may reflux and cause reflux esophagitis even esophageal ulcer, hemorrhage or aspiration pneumonia. Therefore, the head of the patient's bed should be raised about $15\text{-}30^\circ$ to prevent food reflux.

The observation of postoperative complications

- 1) Chest pain: mainly are the retrosternal distending pains caused by the esophageal compression by expanding stent. ^[8] There're few patients who did not suffer from the chest pains. Most of the patients

suffered from different degrees of pains. Generally speaking, the pains self-mitigated about 3-5 days after operation. The 100 mg intramuscular injections of fortanodyn were given to the severe cases (Dolantin should be used with caution). 4 cases in this group were suffering from chest pains and none of them accepted any special treatment. Their pain was self-mitigated.

2) Hemorrhage: The postoperative hemorrhages were mainly caused by light Weiss hemorrhages after dilation therapies of esophageal strictures, friction with metal stents, rough food taken by patients. Therefore the fluid food should firstly be taken after operation, followed by the semi-fluid food and the ordinary food. The patients' blood pressure should be observed with special attention. If their blood pressure was not stable or internal bleeding was suspected, the medical staff would observe their blood pressures and pulses on time until the stableness of their blood pressure were achieved. No situation of massive hemorrhage was found in this group.

3) Dizziness and weakness: mainly because the patients were inadaptable to the ray or the radial seeds were overabundant. 4 cases in this group suffered from different degrees of dizziness and weakness. The dizziness and weakness was self-mitigated 2-3 days after operation, without receiving any special treatment.

4) Leukopenia: mainly because the patients were extremely sensitive to the ray or the radial seeds were seriously overabundant. When the patients felt giddy, hypodynamic, cholestatic or psychasthenic, the doctors should be informed to decide whether the patients' blood routine test should be retested. Generally the patients should retest their blood 2 weeks after operation and less frequently afterwards.

5) Perforation was the most severe complication. The medical staff should pay attention to the chest pain, tachypnea, cyanosis, rapid pulse of the patient. No case of perforation was found in this group. The accompanying staff were given the caution to keep at least 1m from the patients and try every possible means to shorten the contact time with the patients. When discharging the patients, the medical staff should instruct the patient to live a regular life, be optimistic, take moderate diet, take enough rest, sleep enough, review chest radiography and see doctor regularly.

Results

All stent implantations were successful in 6 patients. The endoscopy revealed that the stents were in proper position and expanded well. Their strictures as well as the obstructive symptoms were relieved. Their dysphagia symptoms were improved markedly and all the patients resumed to normal diets. 3-9 months after operation, the follow-up showed that no symptoms like stent migration, stent falling off or other severe complications happened. The dysphagia was found reoccurred in one case 3 months after operation, and the endoscopy showed that cancer tissue spread into the stent from the distal end of the stent. The dysphagia symptom was relieved after the implantation of another normal coated nitinol esophageal stent. One patient died of coronary heart disease and malignant arrhythmia 6 months after operation. The 5 survived patients gained some weight and their mental statuses as well as life qualities were significantly improved.

Discussions

The patients with late-stage esophageal cancer lost the chances for radical surgery, the principle therapeutic purpose is to improve the life quality of the patient and prolong his/her life. At present the advocated therapy is stent implantation and/or intracavitary irradiation. Now we combine the two methods to simplify the treatment procedures, to minimize the suffering of patients and to achieve the purpose of clinical treatments.

The ¹²⁵I seeds we used emit the low-energy-y-ray, their energies are between 27-35 keV, the inter-organizational emission limits range from 1.70cm to 2.0cm and their half lives are 2months. The seeds made from low-energy-radionuclide could be used in radiotherapeutics of the malignant tumor and have the following advantages: kill tumor cells at a close range; the constant low-dosage control the mitosis of tumor cells, visibly control the repopulation of tumor cells; strengthen the sensibility of tumor stent to the ray; have few toxic and side-effects; visibly reduce the complications; the operation is easy and economical. Pre-clinical experiments found the patients' discharge was in full compliance with the environmental radiation safety requirements and needed no special treatment. The medical staff in this group received the radiation dose test twice a week and the doses were far below the limits of modern radiation protection dose -50 MSV. Taken as 12 hours per day and 1.0m away from the patient, all radiation dose every accompanying person staff until the end of patients' radiation attenuation (about

1-1.5 a)received is lower than that from chest X-ray-2MSV2^[15]. Therefore, this treatment is suitable for clinical application. The effects of I¹²⁵ seeds therapy is based on its radioactivity. Most of the patients with the middle/late stage cancer have difficulties of eating food and the symptom of malnutrition. The patients usually were in poor physical conditions and in anxiety. We should patiently introduce the methods, curative effects as well as the pre/in/post procedural cautions to reduce their psychological pressures to ensure the success operation.

This treatment needs cooperative nursing. The medical staff should be well known about the patient's conditions to make a complete personalized nursing plan for

the patient. This also help the clinical doctor adjust the treatment method, increase the success ratio of operation, improve the satisfactory from the patient and reduce medical disputes. A good cooperation assures the success of the operation. The key to the success of the operation and the decrease of complications is that the guide wire should be always under the stricture during the procedure. Therefore the cooperative staff should fix the guide wire to avoid its migration. When loading the I¹²⁵ seeds, the medical staff should push the seed all the way to the bottom of sheath to avoid the fall-off. The medical staff should protect themselves when loading the seeds.

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