

Prevention and Treatment of Postoperative Pulmonary Complications in Elderly Patients with Lung Cancer and Esophageal Cancer

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Abstract: This research aims to investigate strategies for mitigating and treating post-surgical lung complications among patients suffering from lung and esophageal cancers. In this study, 50 senior patients diagnosed with lung and esophageal cancers who underwent surgical tumor removal at our institution between September 2022 and January 2024 were utilized as research subjects. Employing a numerical blind assignment technique, these patients were segregated into two groups: one consisting of 25 patients receiving standard care (control group), and the other comprising 25 patients subjected to specialized care aimed at preventing pulmonary complications (observation group). A comparative analysis was conducted to evaluate clinical metrics, life quality, and the prevalence of pulmonary complications among the groups. **Results:** Metrics such as the duration of rehabilitation and the rate of pulmonary complications were found to be significantly improved in the control group compared to initial expectations, as evidenced by statistical significance ($P < 0.05$). Furthermore, the life quality evaluations revealed that the observation group achieved superior outcomes relative to the control group ($P < 0.05$). Therapeutic interventions targeting pulmonary complications have been shown to significantly mitigate the decline in postoperative lung function in elderly individuals diagnosed with lung and esophageal cancers, enhancing their recuperation rates and substantially improving their life quality. Consequently, such treatments are recommended for broader clinical adoption.

Keywords: Lung Cancer; Esophageal Cancer; Elderly Patients; Pulmonary Complications; Prevention Strategy

1. Introduction

Lung cancer and esophageal cancer are common clinical malignant tumors, which mainly occur in middle-aged and elderly men. Smoking, declined air quality, and consumption of irritating foods are the main causes of these diseases. As they have extremely high mortality and poor prognosis, patients' 5-year survival rate does not exceed 20%[1]. At present, surgical resection is mainly used to treat such diseases in clinical practice, and combined radiotherapy and chemotherapy are carried out based on different pathological types[2]. However, surgery is essentially a traumatic treatment. After the surgery, patients need routine indwelling of related catheters, which often causes pulmonary complications. Besides, some patients, especially elderly patients, have special physiology and pathology, poor understanding and adaptability, so they often have emotions such as anxiety and fear, which greatly influence their recovery efficiency. Therefore, effective nursing is needed for patients after surgery[3]. Based on this, this article will analyze the prevention and treatment strategies and application effects of postoperative pulmonary complications in the form of controlled trials. The specific contents are as follows:

2. Materials and methods

2.1 General materials

Eligibility criteria included: (1) Patient age

was 60 years or above; confirmation of lung or esophageal cancer through diagnostic imaging, which met the criteria for clinical surgery; (2) Absence of any prior surgical procedures or traumatic injuries; (3) Maintenance of a stable mental state and effective communication abilities.

Criteria for exclusion from the study were as follows: (1) Instability in vital signs of the patients; (2) Presence of additional neoplastic diseases; (3) Manifestations of liver or kidney dysfunction alongside gastrointestinal disorders; (4) Voluntary withdrawal from the study for personal reasons.

2.2 Methods

Postoperative nursing staff closely monitored the patients' breathing, pulse, blood pressure, consciousness, body temperature, and so on, and paid close attention to the state of abdominal drainage. According to the color, quantity and nature of the drainage fluid, there may be abdominal bleeding in a short period, they immediately reported to the surgeon or the doctor on duty.

The observation group was provided with preventive nursing of pulmonary complications based on routine nursing, as follows:

① Preoperative nursing: An in-depth conversation should be conducted with patients before the surgery. According to the patient's condition, the disease mechanism, operation process, principle and prognosis of lung cancer/esophageal cancer could be introduced using pictures and texts. Patients should be encouraged to ask questions, easy-to-understand language should be chosen to answer every question patiently, and patients' negative emotions such as pessimism, depression and anxiety caused by insufficient cognition should be eliminated through narrating successful treatment cases, aiming to ensure the smooth progress of treatment and nursing. Moreover, patients should be warned to quit smoking and drinking, effectively improve the clearance ability of respiratory secretions, and then reduce the risk of pulmonary complications.

② Environmental intervention: As the

occurrence of pulmonary complications is greatly affected by the surrounding environment, medical staff must well manage the ward environment, disinfect in time at least 3 times a day, control the source of infection, and ensure that the source of infection is blocked to avoid cross-infection. Among them, the most important disinfection area includes the bedside, bedside cabinet and toilet of the ward. Meanwhile, the indoor temperature and humidity should be adjusted, and ventilation should be done well. Moreover, the number of visits by family members should also be limited to avoid bringing bacteria.

③ Oral nursing care: If the patient had a disturbance of consciousness, the nursing staff needed to carry out oral care on the patient on time and in a standardized manner to reduce the growth of oral bacteria and promote the patient to play its role of mucosal exclusion, phagocytosis and killing of bacteria. Meanwhile, the susceptible pathogens of each patient should be analyzed, and antibiotics should be used according to their drug sensitivity to ensure that the oral cavity is clean enough. If the patient had clear consciousness, the patient should be urged to use baking soda and boric acid mouthwash after eating.

④ Diet intervention: Patients needed to fast for solids and liquids within 3-5 days after surgery. At this time, the nursing staff needed to continuously decompress the patient's gastrointestinal tract, and give the patient intravenous water and nutrition; the patient's anal exhaust and CT examination should be carried out, suggesting that there was no anastomotic leakage, and the body temperature remained normal. After the gastrointestinal decompression drainage was reduced, the nursing staff could remove the gastric tube. After the gastrointestinal decompression was stopped for 24 hours, if the patient did not have symptoms such as severe chest pain, poor breathing, and weakened respiratory sound on the affected side, the patient could try to eat. In the beginning, the patient should try to drink a little water. 1-2 days after eating liquid food, the patient's body temperature, drainage fluid and other indicators should be observed. If there was no abnormality, a

semi-liquid diet should be performed; The patient should eat semi-liquid food for half a month to one month after surgery. If there was no discomfort, the patient should eat soft food; after eating soft food for 3-6 months, if there was no special discomfort, the patient should gradually begin to eat general food. But the patient needed to pay special attention to not eating too much at a meal after returning to a normal diet, and control the amount of diet. Meanwhile, the patient shouldn't eat too fast and should chew carefully and swallow slowly to avoid too much burden on the esophagus, resulting in adverse consequences.

⑤Respiratory training: The nursing staff should teach patients accurate cough and accurate expectoration skills, arrange the physical function, emotional state for abdominal breathing training and lip contraction breathing training, help them adapt to lateral position and bed defecation in advance, and let them prepare for postoperative rehabilitation. The patients should be provided with a head-foot body massage to help them relax, reduce their degree of body compression, and improve their whole body blood circulation 2 times a day. After the operation, the patient's head should be high and the foot should be low. If there was reflux, the patients should spit the secretion at the first time and rinse the mouth in time. For some patients with respiratory edema, they should have respiratory training 3-5 times a day. During the training period, patients should be continuously encouraged and affirmed to ensure their training enthusiasm and improve their respiratory state. Moreover, the nursing staff should actively help patients hold the wound during expectoration, guide them to inhale deeply, cough accurately and forcefully, and prevent wound dehiscence.

⑥ Atomization inhalation and turning over intervention: Inhalation through ultrasonic atomization may provide anti-inflammatory, antibacterial effects, and assist in sputum dilution. It is essential to tailor the dosage of medication based on the specific postoperative conditions of the patient[4-6]. Meanwhile, patients should be assisted to turn over once every two hours, and their backs should be tapped and patted from top

to down and from outside to inside to help them with deep breathing and independent expectoration. In addition, to help patients exclude small bronchial secretions, it was necessary to perform rolling processing such as back patting and massage.

2.3 Observe Indicators

①Clinical indicators: The postoperative hospital stay, ventilator use time and catheter retention time were evaluated. The shorter the time, ② The GQOL-74 scale served as the benchmark for assessing the social functions and volition towards life among patients. ③Incidence of pulmonary complications: including atelectasis, respiratory tract infection and pneumothorax.

2.4 Statistical Analysis

In this research, SPSS22.0 software was utilized for data processing and analysis. Categorical data were presented as percentages and analyzed using the chi-square (χ^2) test, while continuous data were shown as mean \pm standard deviation ($\bar{x} \pm s$) and evaluated using the t-test. A P-value of less than 0.05 was considered statistically significant, indicating substantial differences between the datasets.

3. Results

3.1 Comparison of Clinical Indicators

The comparative analysis revealed that the ventilator application time, hospitalization time and catheter indwelling with significant differences. The detailed information is shown in Table 1.

3.2 Comparison of Quality Of Life Scores

Life quality assessments indicated that the scores for the observation group surpassed those of the control group, demonstrating a statistically significant difference with a P-value less than 0.05. The detailed information is shown in Table 2.

3.3 Comparison of the Incidence of Pulmonary Complications

In the observation group, a single instance of pulmonary infection was recorded, significantly fewer than the number noted in the control group, with a statistically

significant difference ($P < 0.05$). This data is detailed in Table 3.

Table 1. Comparison of clinical indicators between the two groups($\bar{x} \pm s$)

Group	Ventilator application duration (h)	Catheter retention period (h)	Hospitalization duration (d)
The Control Group(n=25)	8.52±4.85	6.33±1.82	8.06±1.55
The Observation Group(n=25)	5.11±3.12	4.68±1.22	6.32±1.47
t	3.448	4.391	4.749
P	0.001	0.001	0.001

Table 2. Comparison of quality of life scores between the two groups($\bar{x} \pm s$)

Group	Body function	Emotional state	Social function	Will to live
The Control Group(n=25)	68.56±3.35	68.44±3.41	69.46±3.26	68.37±3.36
The Observation Group(n=25)	79.25±4.66	79.62±4.68	80.35±4.65	80.14±4.94
t	10.202	10.575	10.474	10.791
P	0.001	0.001	0.001	0.001

Table 3. Comparison of the incidence of pulmonary complications between the two groups[n(%)]

Group	Pulmonary atelectasis	Pulmonary infection	Respiratory failure	Total incidence
The Control Group(n=25)	3(12.00)	3(12.00)	2(8.00)	8(32.00)
The Observation Group(n=25)	0(0.00)	1(4.00)	0(0.00)	1(4.00)
χ^2	-	-	-	12.507
P	-	-	-	0.001

4. Discussion

Currently, the proportion of the elderly in the social population is increasing year by year. The most obvious feature of their physiological changes is the decline of immunity and the higher probability of cancer, and among them, lung cancer and esophageal cancer are more common. The pathogenesis of lung cancer and esophageal cancer is more complex. Long-term smoking, drinking or intake of irritating food may increase the risk of canceration, thus greatly reducing the health and quality of life of elderly patients. Once typical symptoms such as dysphagia, hemoptysis and chest pain occur, it is necessary to go to the hospital in time. With the continuous development of medical technology, most hospitals prolong patients' survival rates by using surgical resection of tumor tissues. The resection range and surgical method need to be determined according to the patient's location of the lesion and the scope of the lesion. The resection range of patients with advanced diagnosis is larger than that

of patients with early diagnosis. However, surgery is an invasive manipulation, which causes great damage to the body. Meanwhile, as the physiological function of elderly patients gradually decreases and the risk of surgical treatment is high, after surgery, they may dare not cough hard due to severe pain and fear of incision dehiscence, so that the sputum can not be effectively discharged, and then the effective gas volume is reduced, a large number of secretions block the airway, some atelectasis, etc., increasing the risk of secondary infection and the incidence of perioperative pulmonary complications^[5-6]. In general, the routine nursing mode lacks certain pertinence, and it is only based on the condition itself, so the overall effect is unsatisfactory. Therefore, it is particularly important to explore the countermeasures to prevent and care for postoperative pulmonary complications.

The research results revealed that the rehabilitation time indexes It was suggested that the implementation of prevention and treatment strategies for pulmonary complications had a positive effect. Cause

analysis: For elderly cancer patients, the key to preventing postoperative pulmonary complications lies in preoperative evaluation and postoperative nursing. Preoperative evaluation of the patient's personal physical and mental status should be strengthened, and health education should be carried out to lay the foundation for subsequent rehabilitation. In the postoperative stage, the intervention was carried out from the perspective of diet, environment, oral cavity, respiratory training, aerosol inhalation, and turning over. Among them, environmental intervention excluded the risk factors of pulmonary complications, oral nursing helped patients balance oral flora, and respiratory training strengthened patients' respiratory muscle strength and endurance. In summary, the intervention treatment of pulmonary complications can effectively reduce the impact of postoperative pulmonary function in elderly esophageal cancer, further accelerate the recovery rate.

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