

The Clinical Value of Accelerated Recovery Care in Pulmonary Rehabilitation of Perioperative Lung Cancer Patients

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Abstract

Aim: To study the clinical value of accelerated recovery care in pulmonary rehabilitation of perioperative lung cancer patients. **Methods:** 98 lung cancer patients undergoing surgery were admitted to our hospital from March 2020 to November 2021 and randomly divided into an observation group and an ACBT (**Active Cycle of Breathing Technique**) training group. Accelerated recovery care and routine care were respectively used in the perioperative period to compare the nursing effects of the two groups. **Results:** All perioperative indicators in the observation group were shorter than those in the ACBT training group. The pain scores at different time periods after surgery were lower in the observation group than in the ACBT training group ($P < 0.05$). There were no significant differences in pre-cancer fatigue scores and pulmonary function indicators between the two nursing groups ($P > 0.05$). The improvement in the above indicators was higher in the observation group than in the ACBT training group after nursing care ($P < 0.05$). **Conclusion:** Accelerated recovery care during the perioperative period for lung cancer surgery patients showed significant effectiveness.

Keywords

Perioperative, Lung Cancer, Accelerated Recovery Care, Value

1. Introduction

Among all malignant tumors in clinical practice, lung cancer has a relatively high risk of incidence. Surgical resection is commonly used as a symptomatic treatment for patients. However, influenced by various factors such as weakness,

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cancer lesions, pain, psychological stress, catheter placement, and misconceptions, patients often have relatively poor recovery during the perioperative period and are prone to a series of complications post-surgery. Therefore, it is necessary to adopt a high-quality nursing intervention model to promote rapid recovery [1]. In this study, our hospital randomly selected a total of 98 lung cancer patients who underwent surgery from March 2020 to November 2021, among whom 49 received accelerated recovery care during the perioperative period and achieved satisfactory results. The report is as follows:

2. Clinical Data and Methods

2.1. General Data

A total of 98 lung cancer patients admitted to our hospital from March 2020 to November 2021 were randomly divided into two groups. Inclusion criteria: 1) Diagnosis of lung cancer confirmed by laboratory and imaging examinations at our hospital; 2) Consent for surgical treatment and meeting the surgical indications; 3) Patients who were informed about the study by professionals at our hospital, voluntarily agreed to participate, and cooperated. Exclusion criteria: 1) Metastasis of the lesion; 2) Hemodynamic instability; 3) Inability to communicate normally. ACBT training group: 28 males, 21 females, aged 37 - 72 years with an average age of (55.76 ± 4.87) years. Accelerated recovery nursing group: 30 males, 19 females, aged 38 - 73 years with an average age of (55.93 ± 4.45) years. The general data of the two groups were comparable ($P > 0.05$).

2.2. Methods

In the ACBT training group, routine nursing care was provided during the perioperative period. Chest nurses conducted routine admission guidance and Active Cycle of Breathing Technique (ACBT) training, which included smoking cessation, ACBT training, and cough exercises. Patients were instructed to undergo ACBT training three times a day, lasting approximately 10 - 15 minutes each time, starting five days before surgery and continuing for one month post-operatively.

The accelerated recovery care group implemented accelerated recovery care on the basis of the control group, specifically: 1) Detailed explanation of the disease, surgery, and relevant nursing knowledge to the patients before surgery to ensure good cooperation with medical staff during the perioperative period. 2) Identification of the patient's pain situation before surgery and appropriate use of analgesic drugs to maintain stable vital signs. 3) Encouragement of patients to exercise aerobically before surgery. 4) Reminding patients to refrain from drinking for 2 hours and fasting for 6 hours before surgery to ensure they can supplement necessary nutrients. 5) On the day of the surgery, instruct the patients to perform respiratory function training and limb movement in bed, and promote intestinal peristalsis. 6) Provide guidance for the patients to start mobilization as soon as possible after surgery to enhance the recovery of vari-

ous body functions. If they experience significant pain, distract their attention by playing music or television, and administer pain medication promptly. 7) For patients with chest tube air leaks and suboptimal lung re-expansion on chest X-ray within 1 day post-surgery, increase negative pressure suction. Use vibrations and positive expiratory pressure to assist with sputum clearance 5 days before surgery and 1 month after surgery to reduce the chances of lung collapse and lung infections. Additionally, assist with weaning, oxygenation, and extubation to alleviate breathing difficulties, improve exercise tolerance, and lower PaCO₂ levels.

2.3. Observation Indicators

1) Perioperative indicators: time of urinary catheter removal, time of chest tube removal, first flatus time, time of first bowel movement, time of ambulation, time of starting oral intake, length of hospital stay.

2) Pain comfort level: Using the VAS pain scale to evaluate the pain levels of both groups at 24 hours, 48 hours, and 72 hours post-surgery. The scale ranges from 0 to 10, with scores inversely proportional to the patient's pain level.

3) Cancer-related fatigue score: Evaluation of behavioral fatigue, emotional fatigue, cognitive fatigue, and physical fatigue using the R-PFS (Piper Fatigue Scale) before and after surgery in both groups. The scale has a maximum score of 220, with scores directly proportional to the level of fatigue perceived by the patient.

4) Pulmonary function indicators: Includes VC (Vital Capacity), FVC (Forced Vital Capacity), FEV1 (Forced Expiratory Volume in one second), FEV1/FVC ratio, PEF (Peak Expiratory Flow), and 6MWT (6-Minute Walk Test) indicators before and after surgery for both groups.

2.4. Statistical Analysis

The experimental data were processed using SPSS 24.0 software. Quantitative data were expressed as $\bar{x} \pm s$ deviation and analyzed using the t-test. A significance level of $P < 0.05$ indicates a statistically significant difference.

3. Results

3.1. Perioperative Indicators

Compared to the ACBT training group, the perioperative indicators in the accelerated recovery care group were all shorter ($P < 0.05$), as shown in **Table 1**.

3.2. Pain Comfort Level

Compared to the ACBT training group, the VAS scores were significantly lower in the accelerated recovery care group ($P < 0.05$), as shown in **Table 2**.

3.3. Cancer-related fatigue score

Before the surgery, the R-PFS scores of the two groups were not significantly

different ($P > 0.05$). After the surgery, the scores in the accelerated recovery care group were lower than those in the ACBT training group ($P < 0.05$), as shown in **Table 3**.

Table 1. Perioperative indicators ($\bar{x} \pm s$).

Group	No.	Time of urinary catheter removal (h)	Time of chest tube removal (d)	First flatus time (d)	Time of bowel movement (d)	Time of ambulation (h)	Time of starting oral intake (d)	Length of hospital stay (d)
ACBT training group	49	14.36 ± 3.91	5.42 ± 1.15	2.50 ± 0.06	4.54 ± 0.98	29.02 ± 4.83	3.16 ± 0.16	9.02 ± 2.03
Accelerated rehabilitation care group	49	5.62 ± 1.31	3.40 ± 1.23	1.16 ± 0.25	3.13 ± 0.96	17.45 ± 3.10	1.85 ± 0.47	5.23 ± 1.60
t value	-	14.836	8.397	36.484	7.194	14.111	18.469	10.264
P value	-	0.001	0.001	0.001	0.001	0.001	0.001	0.001

Table 2. Pain comfort level (score, $\bar{x} \pm s$).

Group	No.	Postoperative 24 hours	Postoperative 48 hours	Postoperative 72 hours
ACBT training group	49	5.36 ± 0.94	4.42 ± 0.36	3.37 ± 0.47
Accelerated rehabilitation care group	49	3.83 ± 0.52	3.12 ± 0.42	2.60 ± 0.38
t value	-	9.969	16.450	8.917
P value	-	0.001	0.001	0.001

Table 3. Cancer-related fatigue score (score, $\bar{x} \pm s$).

Group	No.	Behavioral fatigue		Emotional fatigue		Cognitive fatigue		Physical fatigue	
		Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery
ACBT training group	49	36.48 ± 5.02	30.23 ± 4.24	38.28 ± 5.04	32.41 ± 4.63	35.52 ± 3.10	30.36 ± 3.89	37.63 ± 4.87	31.36 ± 4.12
Accelerated rehabilitation care group	49	36.59 ± 4.96	24.27 ± 3.51	38.36 ± 4.99	25.14 ± 4.44	35.49 ± 3.72	23.63 ± 2.67	37.38 ± 6.19	25.01 ± 3.74
t value	-	0.109	7.579	0.079	7.933	0.043	9.984	0.222	7.988
P value	-	0.913	0.001	0.937	0.001	0.965	0.001	0.824	0.001

3.4. Pulmonary Function Indicators

Before the surgery, the pulmonary function indicators of the two groups showed no significant difference ($P > 0.05$); after the surgery, the accelerated recovery care group was higher than the control group ($P < 0.05$), as shown in **Table 4**.

Table 4. Pulmonary function indicators ($\bar{x} \pm s$).

Group	No.	VC (L)		FVC (L)		FEV1 (L)		FEV1/FVC (%)		PEF (L/s)		6MWT (m)	
		Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery	Before surgery	After surgery
ACBT training group	49	1.89 ± 0.21	2.36 ± 0.25	2.18 ± 0.79	2.38 ± 0.57	1.90 ± 0.58	2.09 ± 0.69	50.61 ± 5.41	70.21 ± 7.24	1.98 ± 0.49	2.40 ± 0.20	232.36 ± 17.96	316.70 ± 27.51
Accelerated rehabilitation care group	49	1.90 ± 0.18	2.87 ± 0.30	2.16 ± 0.73	2.71 ± 0.59	1.93 ± 0.63	2.47 ± 0.42	50.29 ± 5.15	75.72 ± 6.53	1.99 ± 0.50	2.82 ± 0.25	237.26 ± 19.85	402.89 ± 36.37
t value	-	0.253	9.141	0.130	2.815	0.245	3.293	0.299	3.956	0.100	9.183	1.281	13.230
P value	-	0.800	0.001	0.896	0.005	0.806	0.001	0.764	0.001	0.920	0.001	0.203	0.001

4. Discussion

Surgery is one of the main effective methods for clinically treating lung cancer [2]. By implementing surgical resection and other treatments for patients, it is beneficial to eliminate cancer cells from their bodies, and effectively control the disease. However, this approach can cause some damage to the patient's body to some extent, leading to a series of complications and stress reactions. Postoperative pain may be prominent, hindering the patient's recovery and potentially affecting their normal life. Therefore, effective and efficient nursing measures must be taken to improve this situation [3].

Clinically, it is believed that factors contributing to the rapid recovery of lung cancer surgery patients are closely linked to early postoperative exercise and ambulation. Conventional perioperative nursing interventions have certain shortcomings in terms of nursing methods and approaches. Additionally, thoracic surgery carries a high risk and difficulty level, with many postoperative indwelling tubes causing intense pain, leading to reduced exercise tolerance. This can increase the risk of complications such as lung infections and lung collapse. Therefore, it is necessary to implement safer and more effective nursing interventions for these patients to promote their rapid postoperative recovery [4].

Accelerated recovery care is a new nursing concept that has emerged in recent years in China along with the gradual improvement of medical and nursing skills. Guided by evidence-based nursing, this approach optimizes various nursing practices during the perioperative period of lung cancer surgery, effectively reducing surgical stimulation and improving organ function for patients. Scholars have found that applying this nursing model during the perioperative period of lung cancer patients can significantly reduce postoperative complications, promote faster and better recovery, and offer high application value [5] [6].

In this study, patients in the accelerated recovery care group were provided with lung cancer knowledge explanation before surgery, bowel preparation, guidance on correct dietary intake, proper coughing and deep breathing instructions. They were encouraged to engage in appropriate lung function exercises.

This not only enhanced the patients' treatment confidence and alleviated their physical and mental burden but also supplemented the body's nutritional consumption, leading to improvement in their impaired lung function [7] [8].

By controlling fluid intake during surgery, administering preemptive analgesia, and providing thermal care, the patient's comfort level can be improved, ensuring a smoother surgical procedure. Timely targeted postoperative rehabilitation exercise guidance, airway care, catheter care, drainage tube care, and the use of vibration-positive expiratory pressure to assist with sputum clearance are beneficial in stimulating the patient's blood circulation. This approach also helps prevent complications such as lung collapse, leading to further improvement in lung function [9].

5. Conclusion

Based on the results of this study, the accelerated recovery care group showed significantly shorter perioperative indicators such as extubation, ambulation, bowel movements, and flatus compared to the control group. The pain comfort level was lower in the accelerated recovery care group, and the improvements in cancer-related fatigue score (R-PFS), MVV, and 6MWT lung function indicators were higher than those in the ACBT training group. These findings suggest that the application of accelerated recovery care in the perioperative period of lung cancer surgery patients has significant effects, with high feasibility. It is recommended to be widely applied and promoted in clinical practice.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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