Biomedical Research 2017; 28 (19): 8473-8476 *ISSN 0970-938X*
www.biomedres.info

Application of thoracoscopy with fast-track surgery in the thoracotomy of small-cell lung cancer.

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Abstract

Objective: This study aims to investigate the effect of thoracoscopy combined with fast-track surgery in the surgical treatment of small-cell lung cancer.
Method: A total of 120 patients who were admitted in our hospital and underwent surgery for small-cell lung cancer from February 2015 to February 2016 were selected in this study. The patients were divided into an observation group and a control group with 60 cases per group. Pure thoracoscope-assisted thoracotomy was then adopted for the control group, whereas thoracoscopy with fast-track surgery was conducted in the observation group. The two groups were compared in terms of post-operative complications, bleeding quantity, length of stay, and treatment expenses.
Results: The occurrence rate of post-operative complications was significantly lower (P<0.05) in the observation group (3.4%) than in the control group (20%). Moreover, the bleeding quantity, length of stay, and medical expenses were lower in the observation group than in the control group (P<0.05).
Conclusion: Combining thoracoscopy with fast-track surgery during thoracotomy in small-cell lung cancer reduced the occurrence of complications, as indicated by the low post-operative bleeding, short treatment time, and fast post-operative recovery observed in our study. Thus, a favourable therapeutic effect was achieved, and the proposed approach merits vigorous clinical promotion.

Keywords: Small-cell lung cancer, Thoracoscope, Fast-track surgery.

Accepted on September 27, 2017

Introduction

The level of healthcare in China has greatly elevated. Meanwhile, the concept of fast-track surgery has been extensively applied in multiple clinical departments [1,2]. To explore the effect of combining thoracoscopy with fast-track surgery during thoracotomy in small-cell lung cancer, we recruited 120 patients who underwent operations for small-cell lung cancer in our hospital from February 2015 to February 2016. We report the findings as follows.

Data and Methodology

General data

A total of 120 patients who underwent radical surgery of small-cell lung cancer in our hospital from February 2015 to February in 2016 were selected in the present study. These patients were divided into an observation group and a control group with 60 cases per group. In the observation group, 33 of the patients were male and 27 were female. The average age was 54.6 ± 7.5 y, and the disease course lasted an average of 1.3 ± 0.6 y. In the control group, 31 were male and 29 were female. The average age was 53.8 ± 7.2 y, and the average disease duration was 1.4 ± 0.7 y. The two groups did not significantly differ (P>0.05) in age, gender, and disease course and were hence comparable with each other.

Methodology

Post-operative evaluation: Before surgery, the psychological status and character traits were comprehensively evaluated, and psychological counselling was performed in all patients. The characteristics of successful post-operative cases were explained to the patients to relieve their mental stress and enhance their confidence in treatment.

Intra-operative anesthesia and nursing: General anesthesia was given using remifentanil and propofol. During operation, the fluid velocity and total quantity were strictly controlled. Warming was thoroughly maintained appropriately less than 36°C.

Surgical operations: Pure thoracoscope-assisted pulmonary lobectomy was adopted in the control group, whereas combined thoracoscopy and fast-track surgery was conducted in the observation group. The specific steps were as follows. First, a 1.5 cm incision was created at the seventh rib in the mid-axillary line at which the thoracoscope was placed for examination. Subsequently, surgical incision was confirmed under thoracoscopy. Upper pulmonary lobectomy was then implemented at the fourth rib, whereas middle and lower

pulmonary lobectomy was conducted at the fifth rib. The incision was extended along the front end of the latissimus dorsi muscle downward until the mid-clavicular line, and its length was 3-7 cm. The operation was performed under thoracoscopy. As necessary, the incision was lengthened, and the rib was propped open to allow the entry of all instruments needed for relevant operations. Finally, the bronchia, semi-developed blood vessels, and fissured lung were excised. Damage to pulmonary lobes should be avoided during the operation.

Post-operative management: An analgesic pump should be used continuously for 48 h after operation. The patients should then be guided to drink sugar or saline water 6 h after the operation with a general dosage of 200-300 mL. Normal diet may be restored on the first day after operation, and the patients were instructed to cough, turn over, and have their backs patted to avoid aspiration pneumonia. Depending on their recovery situation, the patients were allowed to rise from their beds for proper activity. Urinary catheters were extracted from the patients on the second day after operation.

Statistical method

The above-mentioned statistical data were inputted in SPSS19.0 statistical software, (%) was used to express the adoption rate of enumeration data, and χ^2 test or t test was employed to compare rates between groups. P<0.05 indicated that the difference was statistically significant.

Results

Comparison of post-operative complications between the two groups

The occurrence rate of post-operative complications was significantly lower (P<0.05) in the observation group (3.4%) than in the control group (20%) (Table 1).

Post-operative pain scores of patients in the two groups

The visual analog scale pain scores were significantly lower (P<0.05) in the observation group than in the control group within the post-operative 6-24 h period (Table 2).

Comparison of various indexes between the two groups

The bleeding quantity, length of stay, and medical expenses were significantly better (P<0.05) in the observation group than in the control group (Table 3).

Table 1. Comparison of post-operative complications between the two groups.

Group	Number of cases	Pulmonary infection	Post-operative air leak	Pleural effusion	Post-operative atrial fibrillation	Occurrence rate of complications
Observation group	60	1 (1.7)	0 (0)	1 (1.7)	0 (0)	3.4
Control group	60	2 (3.4)	3 (5.1)	4 (6.8)	3 (5.1)	20
χ^2	-	4.38	5.09	6.27	7.35	8.12
P	-	<0.05	<0.05	<0.05	<0.05	<0.05

Table 2. Comparison of post-operative pain scores between the two groups ($\bar{x} \pm S$).

Group	n	2 h	6 h	12 h	24 h	48 h
Control group	60	0.83 ± 0.28	3.05 ± 0.15	5.71 ± 0.19	3.60 ± 0.24	1.33 ± 0.31
Observation group	60	0.85 ± 0.21	0.80 ± 0.18	2.36 ± 0.16	1.47 ± 0.15	1.38 ± 0.25
T		0.313	52.5965	73.8691	41.2215	0.6877
P		0.7554	0	0	0	0.4944

Table 3. Comparison between the two groups in various indexes ($\bar{x} \pm S$).

Group	Number of cases	Length of stay	Post-operative bleeding quantity	Hospitalization expense
Observation group	60	6.3 ± 1.4	175 ± 36	12358 ± 2634
Control group	60	12.5 ± 1.8	352 ± 69	18627 ± 2750
t	-	11.05	13.26	14.39
P	-	<0.05	<0.05	<0.05

Discussion

With the continuous improvement in medical treatment, thoracoscopy combined with fast-track surgery has been commonly applied in small-cell lung cancer. This strategy has reduced the post-operative complications and bleeding quantity, shortened the length of stay, facilitated the body's recovery, and obtained a favourable therapeutic effect [3].

Meanwhile, medical expenses are conserved because of the shortened admission. In this regard, their economic pressure and burden are relieved, and their living quality is improved.

Pain is an unpleasant feeling and emotional experience caused by tissue damage or potential tissue damage. A previous relevant study has divided pain into acute and chronic pain depending on pain duration. The study finalized the classification into neuropathic pain and nociceptive pain on the basis of the nature of pain and damage state [4].

In particular, pain from surgery belongs to the latter and regarded as acute nociceptive pain. The duration of acute pain is usually shorter than 1 month and is generally related to the operative wound, tissue damage, or illness state. By contrast, that of chronic pain stretches over 3 months and may persist even after the resolution of the primary disease or the healing of tissue damage [5,6].

Post-operative pain is acute pain after operation that does not exceed 7 d in duration. In surgeries, such as thoracic operation with massive trauma and joint replacement requiring long-term functional exercises, analgesia is occasionally required to be maintained for several weeks [7].

Post-operative pain is inflammatory pain caused by the stimulation of nociceptors by post-operative chemical, mechanical, or temperature change and belongs to nociceptive pain. FTS accelerates patient recovery [8]. Moreover, it emphasizes improving the treatment and nursing quality of diseases besides shortening the length of stay and conserving medical resources. The smooth implementation of this process entails mutual cooperation and coordination among doctors, nurses, and patients in the perioperative period [9].

In recent years, the FTS concept has been gradually perfected in its application process with expanded treatment scope and has exerted favourable effects on patients. However, FTS involves numerous schemes; hence, its combination with lung cancer surgery should be strengthened [10].

A total of 120 patients who underwent radical operation of small-cell lung cancer were selected as study objects, and the observation group significantly benefitted after receiving thoracoscopy combined with fast-track surgery.

Results showed that compared with the control group, the observation group sustained significant advantages ($P<0.05$), such as fewer complications, a shorter length of stay, lower post-operative bleeding, and less hospitalization expenses. Thoracoscopy with fast-track surgery remarkably improved the radical operation of small-cell lung cancer.

Conclusion

In summary, thoracoscopy combined with fast-track surgery during thoracotomy in small-cell lung cancer has reduced complications, with low post-operative bleeding, short treatment time, and fast post-operative recovery. Ultimately, the proposed procedure obtained a desirable therapeutic effect and therefore merits vigorous clinical promotion.

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