International Journal of Clinical and Experimental Medicine Research, 2025, 9(4), 429-433
https: //www.hillpublisher.com/journals/ijcemr/
ISSN Online: 2575-7970
ISSN Print: 2575-7989

Study on Anesthesia Cooperation and Nursing Intervention in Thoracoscopic Lung Tubeless Surgery

Feng Ren

Deyang People's Hospital, Deyang 618000, Sichuan, China.

How to cite this paper: Feng Ren. (2025) Study on Anesthesia Cooperation and Nursing Intervention in Thoracoscopic Lung Tubeless Surgery. *International Journal of Clinical and Experimental Medicine Research*, 9(4), 429-433.
DOI: 10.26855/ijcemr.2025.07.007

Received: May 31, 2025
Accepted: June 30, 2025
Published: July 31, 2025

***Corresponding author:** Feng Ren, Deyang People's Hospital, Deyang 618000, Sichuan, China.

Abstract

Objective: To analyze the effect of thoracoscopic lung single-port tubeless technology and anesthesia, and nursing care on patients with early pulmonary nodules. **Methods:** A total of 80 patients with early pulmonary nodules who underwent surgery from June 2024 to April 2025 were selected as the survey subjects. The patients were divided into two groups by a random number method. 40 patients in the control group underwent conventional lung tubeless surgery and nursing intervention, and 40 patients in the observation group underwent tubeless surgery and anesthesia and nursing intervention. The postoperative analgesia satisfaction and adverse reactions of the two groups were compared, and their postoperative pain reaction indicators were investigated. **Results:** The postoperative analgesia satisfaction of the observation group was significantly higher than that of the control group ($p<0.05$); the adverse reaction rate of the observation group was lower than that of the control group ($p>0.05$); the pain reaction of the observation group 6h after surgery was lower than that of the control group ($p<0.05$); 12h after surgery, there was no statistically significant pain between the two groups ($p>0.05$). **Conclusion:** During thoracoscopic lung tubeless surgery, precise anesthesia and nursing care for patients will effectively reduce postoperative pain response and improve patients' comfort and satisfaction during surgery. This therapy and nursing method has application value.

Keywords

Thoracoscopy; Lung tubeless surgery; Anesthesia and nursing care

At present, thoracoscopic technology has developed rapidly and has achieved remarkable results in the treatment of lung diseases. In particular, environmental pollution and viral invasion have led to an increased incidence of lung nodules, which require timely surgical treatment to prevent cancer. During conventional thoracoscopic treatment, the trauma is small, the postoperative recovery is fast, and the risk of complications is low. While meeting the requirements of minimally invasive surgery, the scope of application in thoracic surgery has been expanded [1]. Although the surgical incision is small, it may damage the intercostal nerves or cause friction on the incision. The patient's postoperative pain is quite obvious and cannot promote the patient's recovery. Traditional surgery requires endotracheal intubation anesthesia. As non-intubation and spontaneous breathing anesthesia technology have shown advantages, based on modern rehabilitation concepts, good anesthesia cooperation during surgery will effectively improve the condition and enhance the patient's treatment effect [2]. To this end, this study took the patients with early lung nodule surgery admitted to our hospital as the observation objects to analyze the clinical application value of anesthesia cooperation and nursing in thoracoscopic lung tubeless surgery.

1. Materials and Methods

1.1 General Information

A total of 80 patients with early pulmonary nodules who underwent surgery from June 2024 to April 2025 were selected as the survey subjects. The patients were randomly divided into two groups, with 40 cases in each group.

The control group included 23 males and 17 females, aged 23-66 (40.32±4.33) years old, BMI 18.5-25.3 (22.32±2.54) kg·m²; pulmonary nodule conditions: 18 cases of adenocarcinoma in situ and 22 cases of microinvasive ductal carcinoma; the observation group included 24 males and 16 females, aged 24-67 (40.42±4.36) years old, BMI 18.1-25.7 (22.25±2.65) kg·m²; pulmonary nodule conditions: 20 cases of adenocarcinoma in situ and 20 cases of microinvasive ductal carcinoma; there was no statistically significant difference in the basic data between the two groups ($p>0.05$).

Inclusion criteria: (1) Preoperative CT examination meets the diagnostic criteria for pulmonary tuberculosis; (2) Pathological examination shows early malignant pulmonary nodules; (3) No obvious abnormalities in cardiopulmonary function.

Exclusion criteria: (1) previous pleurisy; (2) combined with severe respiratory diseases and diabetes; (3) incomplete clinical data and withdrawal from the study.

1.2 Methods

Both groups of patients fasted for 8 hours and were watered for 4 hours before surgery. CT scans were routinely performed before surgery to determine the location of the lesion, and the incision was located between the 4th and 5th intercostal spaces under the armpit. In addition, 30 minutes before surgery, both groups of patients received intramuscular injections of phenobarbital 0.1g and atropine 0.5mg. During the induction of anesthesia, dexmedetomidine 0.4μg·kg^{-1} was intravenously infused, followed by injections of dexamethasone 10mg and midazolam 2.5-3mg·kg^{-1}. Laryngeal mask ventilation was then placed, but muscle relaxants were not used. Spontaneous breathing was retained, and thoracic paravertebral nerve block and intercostal nerve block were completed under the guidance of B-ultrasound technology. After waiting for the lung to collapse naturally, 20g·L^{-1} lidocaine 5ml was sprayed to reduce the cough reflex. Lidocaine vagus nerve block intervention (20g·L^{-1}) was performed under direct thoracoscopy. The lesioned lung lobe was cut off through the laparoscopic incision, followed by pathological examination. After the operation, there is no need to leave a drainage tube. Assess whether the lung wound is leaking and stop bleeding smoothly. Aspirate the pleural effusion to promote local swelling. Place a chest drainage tube in the affected chest and place the patient in a head-high, feet-low position. Leave incision sutures near the chest drainage for use. Connect a sealed bottle. The anesthesiologist confirms that there is no bubble overflow, removes the drainage tube, and tightens the sutures to close the chest.

Control group: Routine nursing intervention was performed during the operation. Health education was given to patients before the operation. Patients were reminded of the fasting and water abstinence period. Patients were reminded to cooperate closely during the operation. The patients' vital signs were observed throughout the whole process. Intravenous lines and laryngeal mask anesthesia were opened for patients according to the anesthesiologist's requirements. After the operation, the patients' physiological state was routinely paid attention to, and the changes in their vital signs were recorded.

Observation group: Anesthesia and nursing intervention were adopted during the perioperative period. (1) Preoperative: Preoperative care is the basis for ensuring the smooth progress of Tubeless surgery. According to the patient's surgical tolerance, the patient is prepared physically and mentally to reduce the risk of surgery. Nursing staff need to fully understand the patient's physical condition before surgery, such as cardiopulmonary function, liver and kidney function, etc., to ensure that preoperative preparation is complete. (2) Intraoperative: This stage is the key link of nursing. According to the requirements of the operation, the nurse assists the doctor in positioning the body to fully expose the surgical field of view for the doctor's operation. In terms of body position, the patient's comfort should be fully considered to avoid pressure sores caused by improper body position. Place the patient's limb functional position to avoid excessive flexion and extension, and communicate with the anesthesiologist to ensure that the timing of body position adjustment will not affect the progress of the operation. After anesthesia, the nursing staff closely observes the patient's intraoperative signs and continuously and dynamically monitors the patient's heart rate and blood pressure changes. When the patient's heart rate increases rapidly, it may be related to the excessive intensity of surgical stimulation, and the depth of anesthesia is insufficient, which will cause severe pain. The nursing staff needs the anesthesiologist to appropriately increase the depth of anesthesia. If the patient's blood pressure drops sharply, it is related to bleeding, anesthesia depth, and abnormal cardiovascular function. The nursing staff needs to inform the doctor in time to assist in emergency treatment. In addition, the nursing staff assists the anesthesiologist in management, and injects anesthetic drugs in a timely and accurate manner according to instructions to ensure that the depth of anesthesia is appropriate. In addition, the drug dosage and concentration are accurately checked before each administration to avoid medication errors. Closely observe the patient's drug reactions, including respiratory depression and blood pressure fluctuations. When the operation enters the strong stimulation stage, such as cleaning lymph nodes and separating tissues, the amount of anesthesia needs to be appropriately increased to keep the patient in a painless state. After surgery, the amount of drugs is reduced to prepare for the patient's anesthesia awakening. Routinely monitor the patient's vital signs after surgery to prevent adverse reactions.

1.3 Observation indicators

(1) Satisfaction with postoperative analgesia: Investigate patients' satisfaction with postoperative analgesia, including very satisfied, generally satisfied, and dissatisfied.
(2) Adverse reactions: nausea, vomiting, dizziness, and hypotension.
(3) Postoperative pain reaction: The pain reaction was investigated at 6h and 12h after surgery using the VAS scale, which ranges from 0 to 10 points. A high score represents a strong pain reaction.

1.4 Statistical analysis

SPSS 27.0 software was used to process the data. The measurement data $\bar{x} \pm s$ were expressed as standard deviation and t-test value. The count data were expressed as frequency and %. Chi-square test was used. $p<0.05$ was considered statistically significant.

2. Results

2.1 Comparison of postoperative analgesia satisfaction between the two groups

The postoperative analgesia satisfaction in the observation group was significantly higher than that in the control group ($p<0.05$) (see Table 1).

Table 1. Comparison of postoperative analgesia satisfaction between the two groups (n, %)

Group	Number of cases	Very satisfied	Generally satisfied	Dissatisfied	Satisfaction
Observation Group	40	18 (45.00)	20 (50.00)	2 (5.00)	38 (95.00)
Control group	40	14 (35.00)	17 (34.00)	9 (22.50)	31 (77.50)
x^2					4.328
P					0.042

2.2 Comparison of adverse reactions between the two groups of patients

The adverse reaction rate in the observation group was lower than that in the control group ($p>0.05$) (see Table 2).

Table 2. Comparison of adverse reactions between the two groups of patients (n, %)

Group	Number of cases	Nausea and vomiting	Dizziness	Low blood pressure	Incidence
Observation Group	40	1 (2.50)	0 (0.00)	1 (2.50)	2 (5.00)
Control group	40	2 (5.00)	1 (2.50)	2 (5.00)	5 (12.50)
x^2					1.782
P					0.087

2.3 Comparison of postoperative pain response between the two groups

The pain response in the observation group was lower than that in the control group 6 hours after surgery ($p<0.05$); 12 hours after surgery, there was no statistically significant difference in pain between the two groups ($p>0.05$) (see Table 3).

Table 3. Comparison of postoperative pain response between the two groups ($\bar{x} \pm s$, points)

Group	Number of cases	6 hours after surgery	12 hours after surgery
Observation Group	40	2.01±0.34	0.81±0.13
Control group	40	3.13±0.78	1.02±0.31
t		5.377	0.773
p		0.001	0.681

3. Discussion

China's medical technology has developed rapidly, and thoracoscopy has achieved remarkable results in the field of lung treatment. This technology has low trauma and a fast recovery. It has replaced traditional thoracotomy and has become a common technology for the treatment of lung diseases. Tubeless surgery is a treatment method that reduces patient trauma and reduces complications [3]. Traditional thoracoscopic surgery implements endotracheal intubation anesthesia and leaves a drainage tube after surgery to ensure the progress of the operation and promote patient recovery. However, endotracheal intubation may cause postoperative throat pain and vocal cord injury. Leaving a drainage tube causes discomfort to the patient and increases the risk of infection, prolonging the patient's hospital stay [4]. Tubeless surgery breaks this treatment technology and preserves the patient's respiratory function without endotracheal intubation. The anesthesia effect is high. No invasive technology is used during the operation to achieve tubeless treatment. This surgical technique avoids airway injury and reduces the incidence of ventilator-associated pneumonia. Anesthesia cooperation and nursing are of great significance to patients undergoing tubeless surgery. Compared with traditional thoracoscopy, the chest incision of traditional treatment is about 20 cm, cutting off the chest wall muscles and ribs, which will cause great damage to the chest wall, cause severe pain after surgery, and slow recovery. Traditional thoracic techniques still require general anesthesia, intubation, and multiple drainage tubes after surgery. Tubeless surgery reduces surgical trauma, and the postoperative chest wall pain response is lower than that of traditional surgery patients, and the amount of postoperative analgesics will also be reduced.

As shown in this study, the observation group adopted anesthesia and nursing, which effectively reduced the patient's intraoperative injury, maintained a stable anesthesia depth, reduced the pain response 6 hours after surgery, and improved the patient's satisfaction with anesthesia and analgesia compared with the conventional nursing model. During tubeless surgery, the anesthesiologist should accurately select anesthetic drugs according to the actual situation to ensure that the patient is painless and unconscious, while maintaining the stability of spontaneous breathing to avoid insufficient anesthesia depth and other complications [5]. Nursing intervention should be carried out throughout the whole process, from preoperative, intraoperative, and postoperative stages, with the focus on intraoperative nursing, especially anesthesia cooperation and monitoring. Each link requires precise nursing by nursing staff to reduce the patient's tension during surgery, improve the patient's surgical tolerance, reduce the risk of postoperative complications, and promote the patient's early recovery. In this study, the anesthesia and nursing cooperation method was optimized. For example, the nursing staff evaluated the patient's physical signs and stress response, screened the appropriate anesthesia and nursing cooperation, ensured the safety and comfort of life during surgery, and reduced the risk of anesthesia complications [6]. The postoperative adverse reaction rate in the observation group was lower than that in the control group, but the overall difference was not significant. The reason is that Tubeless surgery is safer, with a faster recovery rate after surgery, and avoids airway damage and complications caused by airway intubation. Fewer anesthetic drugs are used during surgery, which can help the patient wake up as soon as possible after surgery. Generally, the patient wakes up within 2 hours, and the respiratory function is well restored, and the patient may eat and move independently faster. In contrast, traditional surgical methods will cause throat discomfort and pain, which will affect the patient's fasting, and it will take a long time to resume normal activities after surgery. Tubeless surgery significantly shortens the length of hospital stay, reduces the economic burden on patients, and improves the hospital's bed turnover rate. The challenge faced by Tubeless surgery is intraoperative hypoxemia, mainly because the patient's spontaneous breathing is retained during surgery. The surgical operation may cause compression of lung tissue, affect the lung ventilation function, lead to insufficient oxygenation, or hypoxemia. For this reason, prevention should be paid attention to during Tubeless surgery. Anesthesia care is a difficult challenge that requires nursing staff to cooperate with anesthesiologists to ensure painless and unconscious circulatory function during surgery. When determining the drug dosage, the patient's age and weight should be considered to avoid respiratory depression caused by excessive anesthesia. When patients develop hypoxemia, nursing staff should adjust the patient's position, appropriately increase the oxygen concentration, and administer respiratory stimulants to improve the patient's oxygenation status. Nursing monitoring is the key work content of nurses. Nursing staff need to closely monitor the patient's vital signs and surgical progress and report any abnormalities. During tubeless surgery, the patient's respiratory and circulatory functions are unstable, so nursing staff need to monitor more frequently, for example, monitoring once every 5-10 minutes and keeping detailed records [7]. During tubeless surgery, instrument preparation and delivery are also key links. The surgical instruments should be complete and stable in performance. During the operation, they should be delivered quickly and accurately according to the doctor's needs. The anesthesia status should be repeatedly monitored, and the doctor should promptly cooperate with infusion and blood transfusion. Emergency drills should be conducted regularly, and the patient should be familiar with various emergency plans and

operating procedures. While accumulating experience, the nurse should remain calm in actual work and respond decisively to emergencies. After the operation, nursing staff should pay attention to the postoperative recovery. Although tubeless surgery causes less damage, patients will still experience varying degrees of pain, which will affect their recovery. During the postoperative recovery period, the patient's pain response can be assessed, and pain care measures can be implemented according to the doctor's instructions to reduce postoperative pain and improve their postoperative comfort [8].

In summary, for patients undergoing thoracoscopic lung tubeless surgery, anesthesia nursing cooperation can improve the safety of anesthesia, reduce postoperative pain reactions, and improve patients' satisfaction with analgesia. This nursing model is safe and reliable and has application value.

References

[1] Shi YC. Evaluation of the effect of warming during the recovery period combined with verbal awakening on the nursing care of patients undergoing thoracoscopic surgery for lung cancer. Chin J Antituberc. 2024;46(S2):378-80.

[2] Zhang CR, Rui SS, Jiang XH. Application of respiratory care guidance in postoperative care of patients undergoing thoracoscopic surgery. Health Care Med Res Pract. 2024;21(S1):264-6.

[3] Zhang D, Wang FJ, Xiao WQ, et al. Application effect of rapid recovery nursing model in patients undergoing thoracoscopic lung cancer surgery. Huaihai Med J. 2024;42(6):639-41,646.

[4] Lian WQ, Huang YQ, Huang HX, et al. Clinical application of laparoscopic tubeless adrenalectomy. Lingnan Mod Clin Surg. 2024;24(5):291-5.

[5] Xi L, Fang SC, Cao H. Application value of single-port tubeless technique in minimally invasive surgery for early malignant pulmonary nodules. J Clin Pulm Med. 2023;28(12):1846-51.

[6] Yi CS, Yue P, Hu WT, et al. Single-center retrospective cohort study of tubeless video-assisted thoracoscopic surgery for primary hyperhidrosis of the hands. Chin J Clin Thorac Cardiovasc Surg. 2022;29(3):318-22.

[7] Long DZ, Xiong SQ, Fu EJ, et al. Evaluation of the efficacy of tubeless minimally invasive percutaneous nephrolithotomy under local anesthesia. Chin J Endosc. 2020;26(7):58-62.

[8] Yang YJ, Xu X, Feng QY, et al. Safety and efficacy analysis of completely tubeless percutaneous nephrolithotomy. Clin Med Eng. 2020;27(4):413-4.