

The Clinical Anesthesia Effect of Remifentanil Combined with Propofol in Laparoscopic Cholecystectomy in the Elderly

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Abstract: *Objective:* To explore and analyze the effect of remifentanil combined with propofol for anesthesia in patients undergoing laparoscopic cholecystectomy, and to explore its clinical application value. *Methods:* A total of 64 patients who underwent laparoscopic cholecystectomy were selected and randomly divided into two groups, with 32 patients in each group. The anesthesia used in the control group was propofol combined with fentanyl, whereas the observation group was propofol combined with remifentanil and fentanyl. Medical staff routinely performed thyroidectomy on the patients after receiving anesthesia. After the treatment was completed, the researchers recorded the adverse reactions of the patients and the anesthesia effect during laparoscopic cholecystectomy and analyzed the anesthesia effect of the patients. *Results:* After the operation, the excellent and good rates of anesthesia in the observation group were significantly higher ($P < 0.05$). Pain in the observation group was significantly lower ($P < 0.05$). The clinical indicators after receiving anesthesia were significantly better in the observation group ($P < 0.05$). During the operation period, the two groups had different degrees of adverse reactions, while the incidence of adverse reactions in the observation group was relatively lower ($P < 0.05$). *Conclusion:* Patients in the observation group showed better anesthesia and lower pain levels during surgery, higher excellent and good rates of anesthesia, lower VAS scores, and better anesthesia indicators. Therefore, remifentanil-propofol combined anesthesia can be used as an effective anesthesia option in laparoscopic cholecystectomy, which improves the anesthesia effect during the operation and the postoperative pain control of patients and has clinical application value.

Keywords: Diagnosis and treatment methods; Thyroidectomy; Remifentanil; Propofol; Complications

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1. Introduction

With the continuous development and progress of medical technology, laparoscopic cholecystectomy has become a common surgical method in clinical practice ^[1]. During this surgical procedure, the choice of anesthesia plays a crucial role in the success of the procedure and the patient's postoperative recovery. Laparoscopic cholecystectomy, also known as laparoscopic cholecystectomy, is a common surgical procedure used to treat gallbladder disease, especially cholecystitis or caused by gallstones. The operation uses the laparoscopic technique, and the laparoscope and other surgical instruments are inserted into the patient's

abdominal cavity through several small incisions in the abdominal wall ^[2]. A laparoscope is a long, thin, tube-shaped instrument with a camera that transmits images of the inside of the abdominal cavity to a monitor for the doctor to view. During the operation, the doctor uses instruments under the guidance of the laparoscope to first expose the gallbladder, and then resect or remove the gallbladder ^[3]. Typically, the cystic duct between the gallbladder and the liver is clipped or ligated, and the gallbladder is separated from the liver and eventually removed from the abdominal cavity ^[4]. Laparoscopic cholecystectomy has the advantages of minimal invasiveness and fast recovery but requires highly effective anesthesia. As an efficient anesthetic drug, remifentanyl has the characteristics of small side effects, quick onset, and long-lasting effects, and has gradually attracted attention in clinical application ^[5]. As a commonly used intravenous anesthetic, propofol has no significant inhibitory effect on the respiratory function of patients and has a good sedative effect ^[6]. Therefore, the combined application of remifentanyl and propofol may have a positive effect on the effect of anesthesia in elderly laparoscopic cholecystectomy. The drug effects of remifentanyl and propofol are relatively reversible, and the anesthesiologist can adjust the dosage and concentration of the drugs at any time according to the needs of the operation to ensure the depth and stability of anesthesia ^[7]. This paper explores and analyzes the effect of remifentanyl combined with propofol for anesthesia in patients undergoing laparoscopic cholecystectomy, and discusses its clinical application value.

2. Materials and methods

2.1. General information

During the setting of this study, the experimental period from January 2021 to October 2022 was selected, and 64 patients who underwent laparoscopic cholecystectomy during this period were selected for the study. The patients were randomly divided into two groups, each with 32 patients. The control group included 14 male patients and 18 female patients, and the age range was between 19 and 36 years old, with a mean age of 31.2 ± 4.8 years old. The observation group included a total of 16 male and 16 female patients, with an age range between 19 and 35 years old, and the mean age of the patients was 32.9 ± 5.1 years old.

Inclusion criteria included patients aged 18 years and above who underwent laparoscopic cholecystectomy, patients diagnosed with thyroid cancer by clinical and imaging examination; patients whose operation type was laparoscopic cholecystectomy, and patients who can cooperate with and accept remifentanyl-propofol combined anesthesia combined with operating room nursing intervention.

Exclusion criteria included patients under the age of 18, patients with severe cardiopulmonary, liver, and kidney dysfunction or other serious underlying diseases, patients with previous allergies to remifentanyl, propofol, or other related drugs, patients with active malignant tumors, patients with mental illness or cognitive impairment, unable to cooperate with anesthesia and post-operative care requirements and patients who plan to undergo emergency surgery or have surgical contraindications.

The relevant data in the basic information of the patients in this study were statistically checked to confirm that the test results of the patients were $P > 0.05$, indicating that the comparability was good.

2.2. Methods

In this study, all patients were fasted according to the requirements before undergoing laparoscopic cholecystectomy to ensure that the patients kept an empty stomach during the examination. After entering the operating room, the medical staff established intravenous access for the patients and give the patient 500 mL sodium lactate ringer intravenous injection and the medical staff connected the electrocardiogram indicators to detect the patient's heart rate, blood pressure, and other indicators.

Patients in the control group received propofol combined with fentanyl anesthesia, the specific method was as follows: first, the patients received intravenous injection of 0.05 mg fentanyl, and then received 1 mg/kg propofol 2 minutes after the injection.

Patients in the observation group received remifentanyl combined with propofol anesthesia and received intravenous injections of 0.05 mg fentanyl and 0.1 mg/kg remifentanyl, and 1.2–1.5 mg/kg propofol 2 min after the injection.

2.3. Evaluation criteria

The evaluation criteria of this study are as follows:

- (1) Excellent: the operation process is stable, the patient is in a good state of anesthesia, and the heart rate and blood pressure are stable; the patient has no obvious reaction to the surgical stimulation, the muscles are fully relaxed, and the breathing is stable; there are no adverse reactions such as nausea and vomiting during the operation; the patient’s postoperative pain level is low, his/her condition is stable, and he/she is able to eat and move normally.
- (2) Good: The operation process is basically stable, the patient is in a good state of anesthesia, and the heart rate and blood pressure fluctuate within an acceptable range; the patient has a slight reaction to the surgical stimulus, but can maintain stability by adjusting the anesthetic; there are occasional mild nausea and vomiting during the operation, which can be quickly relieved; the patient’s postoperative pain level is within tolerance, his/her condition is basically stable, and he/she can eat and move.
- (3) Poor: The operation process is unstable, the patient is in a poor anesthesia state, and the heart rate and blood pressure fluctuate greatly; the patient has a strong reaction to the surgical stimulus, insufficient muscle relaxation, and unstable breathing; frequent adverse reactions such as nausea and vomiting during the operation, that urgent measures are required; the patient’s postoperative pain level is high, his/her condition is unstable, and he/she is not able to eat and move normally.
- (4) Anesthesia index: In this study, medical staff evaluated the hemodynamic index of the patient and analyzed the anesthesia effect on the patient.

2.4. Statistical methods

SPSS 22.0 for Windows software is utilized for processing all data in this study. For count and continuous data, significant statistical analysis was adopted, and the significance standard was set at 0.05. When the *P* value is lower than 0.05, the statistical result is considered to be significant.

3. Results

3.1. Comparison of excellent and good rates of anesthesia between the two groups

After the operation was completed, compared with the control group, the excellent and good rate of anesthesia in the observation group was significantly higher ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of good and good rates of anesthesia between the two groups

Group	Number of cases	Excellent	Good	Poor	Total excellent rate
Observation group	32	15	16	1	96.88%
Control group	32	12	13	7	78.13%
χ^2					9.6547
<i>P</i>					0.0000

3.2. Comparison of pain status before and after surgery in the two groups

Table 2 showed that the pain in the observation group was significantly lower than that in the control group ($P < 0.05$).

Table 2. Comparison of pain status before and after surgery in the two groups

Group	Number of cases	During surgery	After surgery
Observation group	32	5.14 ± 0.63	2.32 ± 0.54
Control group	32	7.25 ± 0.45	5.36 ± 0.66
<i>t</i>		9.6274	8.6241
<i>P</i>		0.0000	0.0000

3.3. Comparison of the anesthesia status of the patients in the two groups

Table 3 showed that after the patients in the observation group received anesthesia, the clinical indicators were significantly better ($P < 0.05$).

Table 3. Comparison of the anesthesia status of the patients in the two groups

Group	Number of cases	Average blood pressure (mmHg)	Heart rate	Blood oxygen saturation
Observation group	32	93.65 ± 2.06	84.45 ± 1.26	97.26 ± 2.81
Control group	32	86.48 ± 1.96	74.85 ± 2.26	92.85 ± 2.96
<i>t</i>		8.2369	9.2624	9.9178
<i>P</i>		0.0000	0.0000	0.0000

3.4. Comparison of adverse reactions between the two groups

During the operation period, the two groups of patients had different degrees of adverse reactions, while the incidence of adverse reactions in the observation group was relatively lower ($P < 0.05$), as shown in Table 4.

Table 4. Comparison of adverse reactions between the two groups of patients (%)

Group	Miscutting of parathyroid glands	Subcutaneous fluid	Wound infection	Total incidence
Observation group ($n = 32$)	1	2	0	9.38%
Control group ($n = 32$)	4	2	3	28.13%
χ^2	-	-	-	9.1954
<i>P</i>	-	-	-	0.0000

4. Discussion

Gallbladder disease refers to various diseases that occur in the gallbladder itself or its surrounding tissues. Among them, the most common disease is gallstones^[8]. Gallstones are solid crystals or stones that form in the gallbladder and can lead to serious complications such as cholecystitis and biliary obstruction. For cholecystitis or pain caused by gallstones, laparoscopic cholecystectomy has become the main treatment^[9]. The use of laparoscopic cholecystectomy is more complicated in older patients because these patients often have more comorbidities and physiological changes. Therefore, choosing an appropriate anesthesia method is crucial to the success of surgery and postoperative recovery in elderly patients^[10]. In this study, the researchers chose

remifentanyl combined with propofol as the anesthesia regimen and compared it with propofol combined with fentanyl. Remifentanyl is a potent synthetic opioid analgesic with rapid onset and potent analgesic effects and is widely used in anesthesia and postoperative analgesia. Propofol is an intravenous anesthetic with good onset and recovery properties and is commonly used in laparoscopic surgery ^[11]. The results of the study showed that patients in the observation group who were anesthetized with remifentanyl combined with propofol showed better anesthesia and lower pain levels during surgery. The excellent and good rate of anesthesia in the observation group was significantly higher, and the VAS score was lower. At the same time, the incidence of adverse reactions in the observation group was also lower, indicating that the anesthesia regime is relatively safer.

Remifentanyl is a powerful narcotic analgesic drug ^[12], which has the characteristics of rapid onset and significant analgesic effect. Propofol is an intravenous anesthetic drug with the ability to induce and maintain a state of anesthesia. The combined application of these two drugs can give full play to their respective advantages and ensure the depth and stability of anesthesia. The value of compound anesthesia is that it provides better anesthesia effect and postoperative pain control ^[13]. The strong analgesic effect of remifentanyl can effectively reduce pain during surgery and provide better operating conditions. The rapid awakening properties of propofol enable patients to quickly regain consciousness after surgery and reduce the length of hospital stay ^[14]. In addition, the controllability of compound anesthesia enables anesthesiologists to make individual adjustments according to the specific conditions of patients and surgical needs, improving the safety of surgical procedures ^[15]. During the anesthesia process, the anesthesiologist can adjust the dosage of remifentanyl and propofol according to the patient's specific conditions and surgical needs, so as to achieve the required depth and stability of anesthesia. With its use at appropriate doses, combined remifentanyl-propofol anesthesia has a lower risk of respiratory and cardiovascular depression. Anesthesiologists can monitor and adjust according to the specific conditions of patients to ensure the safety of anesthesia.

In summary, the clinical application of remifentanyl combined with propofol anesthesia has good effect and value in laparoscopic cholecystectomy. Compared with propofol plus fentanyl anesthesia, patients in the remifentanyl plus propofol group showed better anesthesia and lower pain levels during surgery. The excellent and good rate of anesthesia in the observation group was significantly higher, the VAS score was lower, and the anesthesia indexes were better than those in the control group. Therefore, remifentanyl-propofol combined anesthesia can be used as an effective anesthesia option in laparoscopic cholecystectomy, which can improve the anesthesia effect during the operation and the postoperative pain control of patients, and has clinical application value.

Disclosure statement

The author declares no conflicts of interest.

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