Analgesic effect of flurbiprofen axetil in treatment of single hole thoracoscopic surgery for pneumothorax

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Abstract: The stress response induced by surgery and anesthesia can inhibit the immune function of the body. Studies have shown that pain can inhibit the proliferation of T cells and weaken the activity of NK cells, resulting in immunosuppression. In this study, flurbiprofen axetil was used for drug intervention. The results showed that flurbiprofen can make the serum TNF- and IL-6 levels significantly reduce, illustrate the application of flurbiprofen axetil can promote the inflammatory balance, inhibit excessive stress reaction, thus contributing to the clinical curative effect and postoperative recovery of patients. The authors have also analyzed treatment of primary spontaneous pneumothorax by using single port thoracoscopy. Based on the analysis of the effect of single hole thoracoscopic surgery, it shows that the average time of single hole thoracoscopic surgery group (49±12.34) min, intraoperative blood loss (32.5±7.32) ml, there was no significant difference between the two groups. The result proved that the technique of single hole thoracoscopic surgery can reduce the injury of the chest wall and the hemostasis time, and reduce the incision scar.

Keywords: Immunosuppression, flurbiprofen axetil, diclofenac diethylamine emulgel, surgical treatment, chronic injury.

INTRODUCTION

Surgical trauma can cause pain reactions in the body. Postoperative pain is a complex physiological response of the organism to tissue damage. Studies have shown that pain can inhibit the proliferation of T cells and weaken the activity of NK cells, resulting in immunosuppression. Therefore, we believe that the pain has a very important impact on the immune function of the body, and different postoperative analgesia methods and the choice of drugs may have different effects on the immune function of the organism. Nowadays, the first choice for pain treatment is drug therapy, and the most typical opioid analgesic is PCA analgesic (Sheng *et al*., 2015), which is the typical representative of fentanyl, with central and peripheral analgesic effect. After major surgery, the body can produce inflammation and stress response, inflammatory reaction is too strong and too long can affect the immune cells and tissue repair and other physiological processes, have a negative effect on postoperative wound healing, infection and so on. Flurbiprofen is non selective NSAIDs, the microspheres as drug carrier to ester into the body of the vessel wall penetrating ability, can quickly and effectively in the local inflammation distribution, through mutual and macrophages, endothelial cells and neutrophils and other inflammatory cells, by inhibiting four arachidonic acid pathway, reduce prostaglandin the synthesis, achieve the effect of anti inflammation. In this study, flurbiprofen axetil was used in preoperative preemptive analgesia in patients undergoing thoracoscopic surgery.

In the past twenty years, with the development of science and technology, the rapid development of video-assisted thoracoscopic surgery (Li *et al*., 2015; Abu, 2017). After continuous clinical experience summary and technical training, video-assisted thoracoscopic surgery has been widely accepted and applied all over the world. From the early application in pulmonary bulla resection and mediastinal lymph node biopsy (Vekov *et al*., 2015), lung biopsy and excision of mediastinal tumor, lung resection, and gradually developed into a variety of diseases in Department of thoracic surgery were almost including resection of esophageal cancer surgery(Nayir *et al*., 2015; Liu *et al*., 2017). From the traditional porous VATS to Uniportal video assisted thoracoscopic surgery, single port thoracoscopic surgery has covered almost all department of thoracic surgery minimally invasive surgery. In recent 10 years, with the development of video-assisted thoracoscopic surgery (VATS), the indications for surgery in the Department of thoracic surgery are becoming more and more popular. A wide variety of successful cases have been reported to demonstrate that video-assisted thoracoscopic surgery is a safe surgical technique that is now being used in more complex procedures in the Department of thoracic surgery (Ostojic *et al*., 2015; Li *et al*., 2015; Tural *et al*., 2015). Video assisted thoracoscopic surgery promotes the development of minimally invasive techniques in Department of thoracic surgery.

In 2004, Rocco success made completion of the technical improvement of Uniportal video assisted thoracoscopic wedge resection. Since this method is gradually applied to spontaneous pneumothorax, mediastinal lymph node

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biopsy, pulmonary wedge resection and lobectomy and mediastinal tumors (Fang *et al*., 2017). Uniportal video assisted thoracoscopic surgery is difficult surgical instruments under thoracoscopy for the straight type can not bend, when the instrument is easy to lock, when the operating hole is located in axillary the front for the chest before the lateral operation is difficult, if the direct type devices can be easily operated bending angle. Therefore, in accordance with the situation of the need to exchange the observation hole and the operation of the hole, the change of operating angle is conducive to the operation. With the improvement of surgical technique, there have been a lot of operating instruments with single operating hole. So it is safe and feasible to use the special instrument for the thoracic surgeon who has mastered the skill of thoracoscope and select the appropriate case

MATERIALS AND METHODS

Research object

We have selected 120 cases in 2015-2016 in our hospital undergoing thoracoscopic lobectomy patients as the research object, in patients with male 62 cases, female 58 cases, average age (52.14±5.16) years old. Approved by the ethics committee of the hospital, all patients signed informed consent before surgery, Ethical approval reference number as wdkzpf/16sq.

All patients with preoperative anesthesia was classified as the Association (ASA) class I-II, a second forced expiratory volume (FEV1)/FVC ratio greater than or equal to 70%. Exclusion criteria: The patient had a previous history of thoracic surgery; Patients with heart, kidney, liver and other important organ dysfunction; Patients with severe diabetes, hypertension, systemic lupus erythematosus and other systemic diseases; Patients were given non steroidal antipyretic analgesics or allergic or allergic history of non steroidal antipyretic analgesics within 1 months before the operation; Patients with past gastrointestinal histories such as ulcers, colitis, and Crohn's disease. All patients received double lumen endotracheal intubation and general anesthesia and the patients were divided into treatment group and control group according to the random number table method, 60 cases in each group. The control group consisted of 30 males and 30 females, with an average age of (51.23± 6.05) years. The treatment group consisted of 32 males and 23 females, with an average age of (54.76±5.13) years. The average age, sex composition, ASA classification and disease type group of the 2 groups were analyzed. There was no statistical difference in the length of operation and the time of operation

In common benign diseases in Department of thoracic surgery of primary spontaneous pneumothorax (PSP), with bullae rupture caused by the most common, the traditional method for treatment of thoracic cavity puncture, closed thoracic drainage treatment, but the high recurrence rate, surgical resection of lung bullae may reduce recurrence rate. The traditional operation method with open chest surgery, thoracic axillary incision surgery, video assisted thoracoscopic surgery, the above methods have gradually been eliminated, the VATS (VATS) multi hole (two holes above) has been recognized as the preferred surgical method for the treatment of PSP, single hole thoracoscopic in recent years the operation is in the traditional "three hole" method based on the continuous improvement of thoracoscopy reduced two holes, the operation hole and the observation of Kong Rong for the same channel. A total of 120 cases of single hole mirror technology application in a 3A Chest Hospital of Hohhot city and monoporate thoracoscope technology were of two kinds of operation related indicators were compared and evaluated, further elaborates the single hole thoracoscopic technique is monoporate thoracoscope treatment of PSP has obvious advantages.

Research method

The 2 groups received routine fasting and no drinking before operation. Atropine, 0.5 mg and phenobarbital 0.1 g intramuscular injection were given before operation. After entering the room, an intravenous channel was established to monitor the oxygen protection, ECG, blood pressure and heart rate. And before anesthesia induction, 20min was given flurbiprofen axetil 1 mg/kg intravenous injection to the patients in the treatment group, while the intravenous injection of equal volume normal saline was performed in the control group. With 3g/kg fentanyl, midazolam, etomidate 0.03mg/kg 0.3mg/kg and 0.1 mg/kg intravenous injection of vecuronium was induced successfully after induction of anesthesia, double lumen endotracheal intubation and connected anesthesia respirator, every 40~0.02min given vecuronium 0.04 mg/kg intravenous injection in order to maintain muscle relaxation effect. The postoperative patient-controlled analgesia (PCA) analgesia pump, drug compatibility for fentanyl ondansetron 1mg + 4 mg + 100 ml normal saline, 5ml loading dose, background dose 2 ml/h, analgesia dose of 2ml/, lock time 15 min.

According to the different surgical methods, the patients were divided into two groups, the experimental group used Anerdian pleural fixation, the control group did not use Anerdian, 30 cases in each group. All patients were treated with combined inhalation and intravenous anesthesia. In the ipsilateral seventh or eighth intercostal anterior axillary line slightly after about 1cm long incision implantation into Trocar, 30 degree thoracic thoracic exploration; operation hole in the anterior axillary line slightly before the third or 4 intercostal, basal smaller bullae with silk ligature 2 or suture treatment group bullae cut large basal application of linear stapler closed cutting, according to the organization's discretion to choose white or blue thickness nail. When there is a problem of the angle of the closure of a single operating hole, we need to make organization closed suture or ligature, insert a thin

handle grasping forceps from the mirror hole Trocar, suture grasping into the chest to help adjust the angle. Dry gauze or grinding stone wall friction to the pleura pleural bleeding spots, and then rinse the chest cavity brine, told the anesthesiologist drum lungs, observation of the lungs can be good after the expansion of the chest fluid absorption, the above steps are the same as the two groups. Then the experimental group used dry gauze dipped with Anerdian smear through the chest, a top to the pleura, closing the wound from the mirror hole chest tube; the control group directly from the mirror hole of a chest tube to the pleura top, closing the wound. All patients were followed up for 1 years after operation, and chest CT examination was performed at the age of 1, 3, 6 and 12 months after operation. The operation time, intraoperative blood loss, postoperative drainage volume, postoperative leakage time, postoperative chest tube removal time, recurrence rate and complications of the 1 groups after operation were observed in the two groups.

Test index

Respectively before induction of anesthesia (T1), at the end of operation (T2), 12 h after operation (T3) and 24 h after operation (T4) in patients with venous blood were collected at room temperature 4 ml, standing for 30 min and 3000 r/min centrifugation for 15 min, collected in the upper serum - 20 DEG C to be stored in the refrigerator test. Using radioimmunoassay of serum interleukin -6 (IL-6), tumor necrosis factor α (TNF- α), cortisol (Cort) and glucagon (GC) were detected, the detection step are in strict accordance with the specification of the test kit.

Single hole video-assisted thoracoscopic surgery

Taken the axillary line between the line and the axillary line between the first 5, 6 ribs made about 2.0-4.0cm incision. The silicone incision cover was placed on the incision, placed in a 5mm 30 degree endoscope, combined with preoperative chest CT to determine the location of the bullae, into the endoscopic apparatus to probe the area where the pleural effusion, focusing on the tip of the region and leaves interrupted. If the pleural adhesions to be electrocoagulation separation, according to the specific circumstances to choose appropriate treatment. Clear the location of the bullae, clamp fixed and raised the bullae, at the same time into the endoscopic resection of the sutured lung bullae and with a small part of the normal lung tissue. The position of the suturing suture is preferably about 1 cm from the base of the bullae so as to achieve a radical resection effect.

Using monoporate thoracoscope operation, taken the sixth or 7 intercostal axillary midline incision length of about 1.5cm for the observation hole, inserted the stamp card and the placement of 10mm 30 degree endoscope, made a 2.0-4.0cm long incision as operation hole at the middle axillary line and anterior axillary line between the fourth or 5 intercostal space. The same procedure as single hole thoracoscopy. Clear the location of pulmonary bullae, placement of endoscopic stapler resection of lung bullae.

RESULTS

Comparison of inflammatory status

There was no significant difference between the two groups in age, weight and operation time, intraoperative infusion volume and bleeding volume (P>0.05) (table 1). There was no significant difference in postoperative VAS between the two groups (P>0.05) (table 2). At different times after the operation in patients with inflammatory state between 2 groups, the study found that, compared with T1, T2, T3 and T4 all patients serum IL-6 and TNF- levels were significantly increased, and statistically significant (P<0.05); comparison between groups, groups T2, T3 and T4 of serum IL-6 and TNF- α the level was significantly lower than the control group, with statistical significance (P<0.05) (tables 3-4).

At different time after operation in the 2 groups of stress state is the study found that, compared with the T1 time, 2 groups of patients with T2, T3 and T4 of serum Cort and GC levels were significantly increased, and statistically significant (P<0.05); comparison between groups, groups T2, T3 and T4 in serum and C or the level of GC were significantly lower than the control group, with statistical significance (P<0.05) (tables 5-6).

Anerdian pleural immobilization

Two groups of patients with operation time, intraoperative bleeding, postoperative leakage time, postoperative extubation time and postoperative complications (wound infection, heart rate, blood pressure and abnormal chest pain intervention) incidence was no significant difference (P>0.05); the experimental group postoperative drainage were significantly higher than the control group (P<0.05), visible application Anerdian smear increased pleural cavity will cause pleural effusion; in 1 years after operation, the recurrence rate of pneumothorax in control group was significantly higher than that of experiment group (P<0.05), visible pleural cavity smear Anerdian pleural immobilization can decrease the recurrence rate (table 7).

Comparison of intraoperative related indicators

The mean time of operation: the single-hole thoracoscopic surgery group (49±12.37) min was slightly shorter than that of the single-operation thoracoscopic surgery group (50±10.65) min. There was no increase in operation hole and intermediate thoracotomy in both groups. The mean intraoperative blood loss (32.5±7.32) ml in the single-hole thoracoscopic surgery group was not significantly different from the average intraoperative blood loss (35.1±5.16) ml in the single operation hole group. There was no significant difference between the two groups bleeding and blood transfusion cases.

Table 1: General patient condition

Treatment group	Age (y)	Weight (kg)	Operative time (min)	Infusion volume (ML)	Amount of bleeding (ML)
Control group	62.14±3.34	61.9±2.10	192.04±11.28	2000.00±16 .18	413.32±11.78
Treatment group	63.59±2.51	62.3±3.03	195.12±12.18	2000.00±12.37	416.19±8.58

Table 2: VAS value

Treatment group	T1	T2	T3	T4
Control group	2.17±0.69	141.15±18.62	217.15±35.21	184.42±16.48
Treatment group	2.54±0.87	112.23±11.39	193.21±32.17	127.61±23.71

Table 3: Serum IL-6 level

Treatment group	Number	IL-6(ng/L)			
		T1	T2	T3	T4
Control group	60	56.42±8.54	142.15±17.28	214.05±34.12	185.12±17.58
Treatment group	60	57.11±7.24	125.29±12.53	187.42 ±33.45	127.54±24.26

Table 4: TNF-α level

Treatment group	Number	TNF-α(μg/L)			
		T1	T2	T3	T4
Control group	60	1.12±0.12	3.91±0.11	4.32±0.27	2.71±0.16
Treatment group	60	1.32 ±0.15	3.23±0.12	3.79±0.16	2.54 ±0.17

Table 5: Serum Cort level

Treatment group	Number	Cort(ng/L)			
		T1	T2	T3	T4
Control group	60	12.13±2.36	23.42±2.17	32.16±3.28	21.36±3.85
Treatment group	60	11.57±2.17	17.68±3.68	23.58±3.52	18.21±3.23

Table 6: Serum GC level

Treatment group	Number	GC(ng/L)			
		T1	T2	T3	T4
Control group	60	241.12±22.17	337.35±31.14	432.38±32.61	387.14±31.27
Treatment group	60	239.45±21.24	315.42±28.27	411.57±25.39	330.28±28.32

Table 7: Comparison of operation

Project	Experimental group	Control group	P
Operation time	45.1±10.8	44.7±10.4	0.854
Intraoperative hemorrhage	70.1±24.8	68.1±22.4	0.765
Postoperative leakage time	2.4±0.8	2.6±1.1	0.301
Postoperative drainage	1 140±370	820±310	0.047
Postoperative extubation time	5.4±2.6	4.9±2.9	0.635
Postoperative complications	9	6	0.257
Number of cases of relapse within 1 years	0	4	0.035

Table 8: Comparison of related indexes after operation

Factor	Single-port	Two-port	T value	P value
Operation time (min)	49±12.37	50±10.65	t=0.2517	p=0.0317
Intraoperative blood loss (ml)	32.5 ±7.32	35.1±5.16	t=1.1726	p=0.0814
postoperative hospital stay (d)	5.17±1.24	5.73±1.36	t=1.2867	p=0.1756
postoperative chest tube duration (d)	3.14±1.75	3.38 ±2.11	t=0.4973	p= 0.4813
cost (RMB)	17243.50±1135.24	168913.30±1075.15	t=0.6530	p=0.2408
Drainge Volume of post operative (ml)	224.6±52.60	224.6±52.60	t=1.2584	p= 0.0947

Table 9: Postoperative pain

VAS for pain	Single-port	Two-port	T value	P value
6 h	4.15±0.56	5.08±0.75	t=3.6874	p=0.0126
24h	3.78±0.64	3.95±0.83	t=2.8651	p=0.0071
48h	2.29±0.48	2.71±0.42	t=5.1468	p=0.0358
72h	1.32±0.37	1.53 ±0.36	t=3.7412	p= 0.1753
1 w	0.54±0.41	0.76±0.50	t=0.9632	p=0.0614
Analgesic (n)	15	22	t=4.0538	p= 0.0382
Satisfaction score of incision	3.14±2.05	1.78±1.54	t=3.5792	P=0.0015

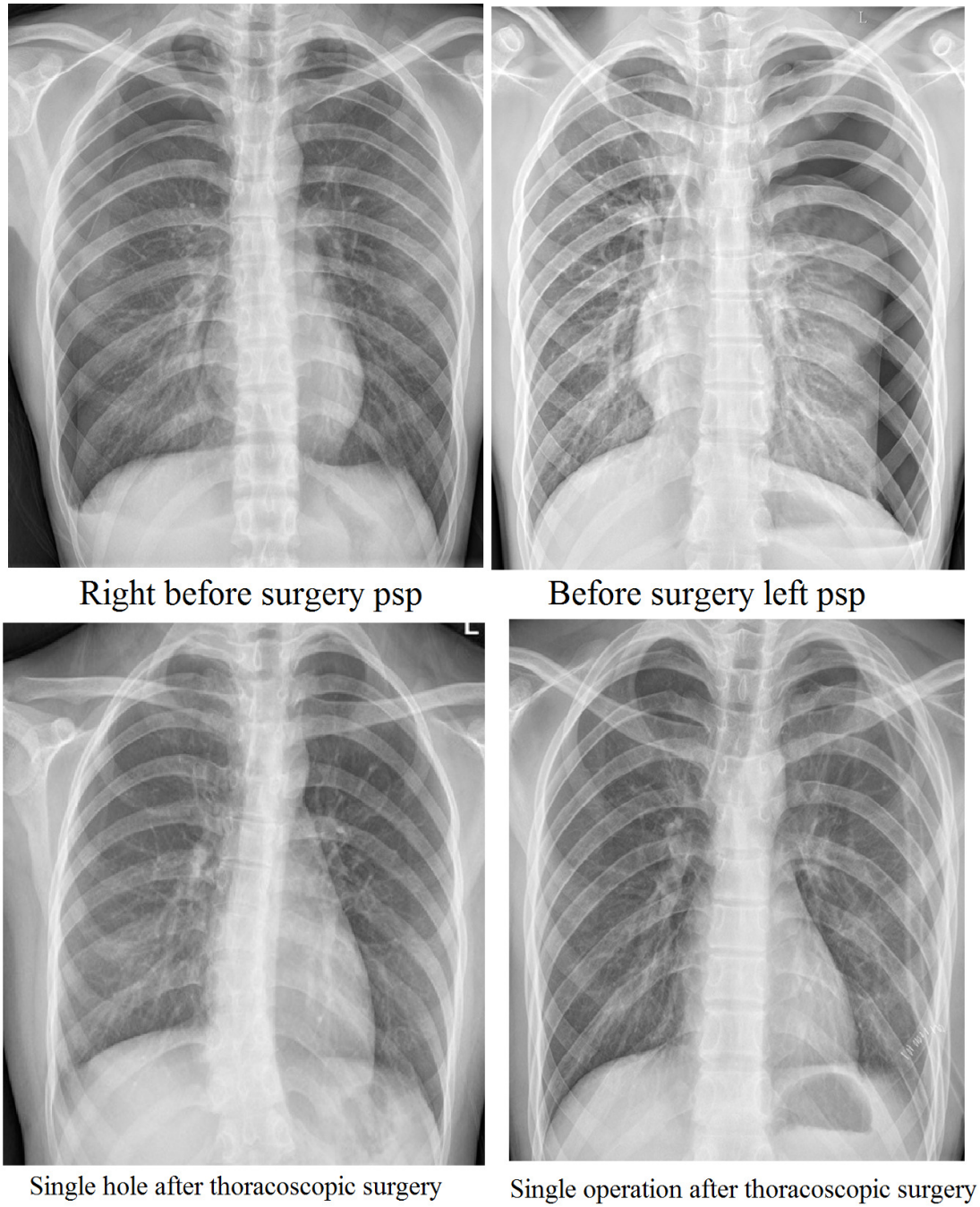

Fig. 1: Comparison of postoperative results

Comparison of related indexes after operation

Postoperative thoracic closed drainage tube retention time: to encourage patients with early functional exercise, moderate cough to promote lung inflation, observe the drainage volume of less than 100ml, no bubbles in the drainage tank, review chest radiographs to give a good expansion of thoracic closed drainage tube. The average postoperative drainage volume was (224.6 ± 52.60) ml in the single-hole thoracoscopic surgery group and no significant difference (238.5±43.25) ml in the single operation hole group. There was no significant difference between the two groups (5.17±1.24) d in the single-hole thoracoscopic surgery group and the average (5.73±1.36) d in the single-operation thoracoscopic surgery group. The majority of patients after removal of thoracic closed drainage tube observed after 24h no obvious abnormalities after discharge. Surgical cost: single-hole thoracoscopic surgery group average (17243.50± 1135.24) RMB surgery and single-operation thoracoscopic surgery group average (168913.30± 1075.15)

Postoperative pain

VAS score at 6 hours postoperatively, 24 hours postoperatively, 48 hours postoperatively, 72 hours postoperatively, Single-hole thoracoscopic group were: 4.15±0.56, 3.78±0.64, 2.29±0.48, 1.32±0.37; The VAS scores were 5.08±0.75, 3.95±0.83, 2.71±0.42 and 1.53± 0.36 respectively after 6 hours, 24 hours, 48 hours and 72 hours after operation. The single-hole thoracoscopy. In the operation group, the postoperative pain score decreased significantly, and the number of cases of postoperative analgesic drugs was single-hole thoracoscopic surgery. Follow-up for 6 months with out pneumothorax recurrence. The postoperative incision satisfaction score (3.14±2.05) was higher in the single-hole thoracoscopic surgery group than in the single-operation group (1.78±1.54), and the patients underwent single-operation thoracoscopic surgery Two scars were performed after surgery, while the single-hole thoracoscopic surgery group had only one scar with the length of the operating hole of the single-operation thoracoscopic cavity, $P<0.05$ was statistically significant.

DISCUSSION

Anesthesia, surgical trauma and postoperative pain can lead to stress reaction. The stress response including the sympathetic adrenal axis, hypothalamus pituitary adrenal axis and neuroendocrine axis of the excitement of pathological process, patients can cause metabolism, immunity and hemodynamics changes, clinical symptoms of arrhythmia, hypercoagulable state, thrombosis and other complications (Ostojic *et al*., 2015). Preemptive analgesia in the analgesic effect of drug intervention on the adverse external stimulus to the body before, effectively blocking the stimulus sensitization of the central nervous system of pain, stress on the body in the process of pathophysiology of effective intervention. Therefore, it is of important clinical significance to adopt safe and effective drug therapy with anti-inflammatory and anti stress reaction before operation. TNF-αcan be released by inflammatory cells in the early stage of inflammation and is mainly secreted by macrophages. The main function is to regulate the activity of various immune cells (Li *et al*., 2015; Tural *et al*., 2015). As a kind of endogenous pyrogen, can induce apoptosis of TNF-α, the main mechanism is the combination of TNF and receptor into the cells resulted in decreased intracellular lysosomal stability, proteases released from lysosomes after causing cell lysis, in addition to TNF-α activation of phospholipase A2 induced by reactive oxygen species (ROS) caused by DNA failure cell death.

Flurbiprofen axetil encapsulated flurbiprofen axetil lipid microspheres. The formulation is suitable for intravenous administration and is slightly stimulated by the vascular endothelium at the time of injection, and has a faster onset and slightly more gastrointestinal response than the oral flurbiprofen axetil. Selective pulmonary flurbiprofen belongs to non steroidal anti-inflammatory drugs, through inhibition of cyclooxygenase block four arachidonic acid metabolism, reduce prostaglandin synthesis, decrease the activation of endothelial cells, macrophages and mast cells, reduce the release of inflammatory cytokines and inflammatory damage mediated (Sheng *et al*., 2015). Lipid microsphere has the characteristics of targeting, shortening the onset time and prolonging the time of drug action. Flurbiprofen has a half-life of 5.8h, and the drug is excreted mainly through urine and does not exhibit accumulation in vivo. The lipid coated microspheres in the human body have a half-life of 12 min and can rapidly dissolve in the blood. After intravenous injection, can be gathered in the surgical incision and local vascular embolism position and inflammation may be related to the incision site selectivity, and inflammatory vascular tissue damage leading to increased gap between endothelial cells, Biluofengengyi accumulation of fluoride(Tural *et al*., 2015). Therefore, flurbiprofen ester has changed the traditional drug distribution and can achieve the effect of targeted therapy to a certain extent.

The use of Anerdian in clinic and iodophor as hardening agent also has a longer period of time, but the mechanism is unknown, may be associated with low pH value, may also lead to pleural irritation exudate increased on inflammation injury, damage cell regeneration, cell movement, cell protein synthesis, collagen and so on. Effect of Anerdian local stimulation is far greater than iodophors, inflammatory mucosal produced more weight, so the adhesion effect than iodophor. At present, as the clinical commonly used Anerdian disinfectant, convenient, low cost, in the application of pleurodesis can produce reliable adhesion, without curing pleural talcum powder like that, it is a reliable sclerosing agent.

Most of the thoracic surgeons currently use traditional video-assisted thoracoscopic techniques (3-hole method) and single-operation thoracoscopic technique (2-hole method) for the treatment of PSP. The single-operation thoracoscopic technique was developed on the basis of a conventional 3-hole thoracoscopy, reducing the auxiliary operating hole in the posterior axillary line, avoiding the thicker muscular layer, the narrow intercostal space, avoiding blood supply Rich in bleeding or bleeding difficult to deal with the situation, reducing the intercostal nerve injury, making the patient's pain was significantly reduced, is conducive to postoperative recovery and postoperative ipsilateral upper limb movement(Vekov *et al*., 2015). This has been considered a breakthrough in the progress of thoracoscopic techniques. However, single-hole thoracoscopic technique is a further enhancement on the basis of single-hole thoracoscopic technique, which integrates the observation hole and the operation hole into a hole, and selects the intercostal space with a slight gap between the chest wall, and further reduces the chest wall tissue Of the injury and incision hemostasis time, reducing the postoperative incision scar, more in line with the perfect concept of minimally invasive surgery, making the original trauma of the smaller TV pacoscopic technology is more minimally invasive, more beautiful.

In this study, there was no significant difference in VAS pain scores between the two groups at 72 hours and 1 week after surgery. We came to the fact that the pain was similar in both groups. Only in the early postoperative use of analgesic drugs and 6 hours after surgery, 24 hours, 48 hours VAS pain score single hole thoracoscopic surgery group was significantly lower than the single operation hole thoracoscopic surgery group. In the two techniques are using the same intravenous inhalation combined anesthesia, postoperative routine use of the same analgesic pump, the existence of the difference between the effective cover of the case, according to long-term clinical care observation, the patient left the day after the closed thoracic drainage tube and chest The pain is more obvious (Fang *et al*., 2017). Single-hole thoracoscopic surgery in patients with most of the general can endure pain, if necessary, can give pain relief treatment. And single operation hole thoracoscopic surgery group of patients after the pain is more difficult to occur frequently. Consider one reason is the chest drainage tube to stimulate the pleural; another reason is the operation of the surgical instruments during the operation of the intercostal nerve compression friction repeated stimulation; also some people think that pain is to promote pleural adhesions in the operation of the machinery of the pleural friction caused. For single hole thoracoscopic pain compared with single operation after thoracoscopic surgery for thoracoscopic surgery, we guess this is due to a reduction of an intercostal incision to reduce soft tissue damage while also reducing the ability of the catcher and the surgical instrument to intercostal Nerve compression friction caused by the chance of injury, which may be a reason to reduce the patient's postoperative pain.

CONCLUSION

A number of studies have confirmed that flurbiprofen has a strong inhibitory effect on inflammatory response in addition to its definite analgesic effect. In this study, before the induction of anesthesia, for preemptive analgesia with flurbiprofen treatment received thoracoscopic lobectomy for patients, results showed that from the end of surgery until 24 h after operation, compared with the control group, flurbiprofen axetil can make serum TNF- and IL-6 levels were significantly lower, serum cortisol and glucagon can hormone levels decreased significantly, indicating the preemptive analgesic effect of flurbiprofen axetil can promote inflammation to maintain balance, inhibit the excessive stress reaction, thus contributing to the clinical curative effect and postoperative recovery of patients.

At present, the uses Anerdian disinfectant, convenient, low cost, in the application of pleurodesis can produce reliable adhesion, without curing pleural talcum powder like that, it is a reliable sclerosing agent. In short, this study has fully proved that single-hole thoracoscopic treatment of PSP safe and reliable, and single-hole thoracoscopic surgery than single-operation thoracoscopic surgery PSP more painful, trauma, beautiful advantages. Single-hole thoracoscopic treatment of PSP worthy of clinical promotion has gradually become the preferred method of treatment of PSP.

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