

Analysis of the Effect of Preventive Acupoint Massage on Perioperative Deep Vein Thrombosis (DVT) in Patients Based on the ERAS Concept

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Abstract: Objective: To analyze the effect of preventive acupoint massage on perioperative deep vein thrombosis (DVT) in patients based on the Enhanced Recovery After Surgery (ERAS) concept. Methods: The clinical data of 116 gynecological patients who received laparoscopic total hysterectomy in the hospital from February 2022 to February 2023 were analyzed retrospectively. They were divided into a control group (n=58, receiving conventional perioperative care) and a study group (n=58, receiving conventional perioperative care plus preventive acupoint massage based on the ERAS concept) according to different perioperative nursing plans. The lower limb deep vein blood flow velocity and lower limb swelling degree before surgery and 7 days after surgery were compared between the two groups. Statistics were collected on nursing satisfaction and the incidence of lower limb DVT within 3 months postoperatively. Results: Compared with pre-operative levels, the blood flow velocity of the common femoral vein (CFV), superficial femoral vein (SFV), and popliteal vein (PV) in the affected limb increased in both groups 7 days after surgery. Furthermore, compared to the control group, the blood flow velocity of the CFV, SFV, and PV in the affected limb of the study group was significantly higher ($P<0.05$). Compared with pre-operative measurements, the thigh circumference and calf circumference of the affected limb increased in both groups 7 days after surgery; however, the increases in thigh circumference and calf circumference in the study group were significantly smaller than those in the control group ($P<0.05$). Compared to the control group, the study group showed higher nursing satisfaction and a significantly lower incidence of lower limb DVT within 3 months postoperatively ($P<0.05$). Conclusion: Preventive acupoint massage based on ERAS concept can improve the blood flow velocity and swelling degree of the affected lower extremity after gynecological laparoscopic surgery, reduce the risk of DVT of the lower extremity, and have high nursing satisfaction.

Keywords: Gynecology; Perioperative period of laparoscopy; Lower limb deep vein thrombosis (DVT); Enhanced Recovery After Surgery (ERAS); Acupoint massage

Uterine fibroids, ovarian cysts, uterine prolapse, adenomyosis, etc. are common gynecological benign diseases that frequently occur in middle-aged and elderly people in clinical practice. Laparoscopic surgery has become an important treatment option for such diseases due to its advantages of small trauma and quick postoperative recovery. However, it is limited by the establishment of Carbon Dioxide (Carbon Dioxide) during the operation. Factors such as pelvic Vein compression caused by pneumoperitoneum (CO₂), blood reflux of the inferior vena cava and iliac vein, sympathetic nerve excitation caused by surgical trauma, and hypercoagulable state of blood can easily lead to Deep Vein Thrombosis (DVT) of the lower extremities during the perioperative period. It can not only cause swelling and pain of the affected limb, In severe cases, it can cause Pulmonary Embolism (PE) and even threaten life ^[1-2]. At present, in clinical practice, the prevention of perioperative DVT mostly starts from drug anticoagulation and physical prevention (such as elastic stockings and intermittent pneumatic compression devices). However, due to the decline of physiological functions and many comorbidities in middle-aged and elderly patients, drug anticoagulation has hidden dangers such as increased bleeding risk. The effect of physical prevention alone cannot meet the satisfactory expectations of clinical practice. Therefore, exploring safe and effective supplementary measures for DVT prevention has become a hot topic in clinical research ^[3]. In recent years, the concept of Enhanced Recovery After Surgery (ERAS) has been widely applied in clinical practice. This concept emphasizes multidisciplinary collaborative management during the perioperative period, reduces the risk of complications by optimizing the diagnosis, treatment and nursing process, and accelerates the recovery of patients ^[4-5]. Preventive acupoint massage based on the ERAS concept refers to an innovative nursing method that combines traditional rehabilitation therapies in traditional Chinese medicine disciplines and promotes the improvement of local microcirculation by massaging specific acupoints ^[6-7]. Theoretically, it can further improve the preventive effect of DVT in patients undergoing laparoscopic surgery during the perioperative period. However, there are currently few reports on this protocol and a lack of practical references. Based on this, this study analyzed the effect of preventive combination with acupoint massage on DVT in patients during the perioperative period of gynecological laparoscopy based on the ERAS concept.

1. Materials and methods

1.1 General

Information A retrospective analysis was conducted on the clinical data of 116 gynecological patients who underwent laparoscopic total hysterectomy in the hospital from February 2022 to February 2023. According to different perioperative nursing plans, they were divided into the control group (58 cases, conventional perioperative care) and the study group (58 cases, conventional perioperative care + preventive acupoint massage based on the ERAS concept). The age of

the control group ranged from 52 to 63 years old, with an average of (58.41 ± 3.68) years old. Disease types: 2 cases of endometriosis, 5 cases of ovarian cysts, 23 cases of uterine prolapse, 4 cases of adenomyosis, and 24 cases of uterine fibroids. The operation duration ranged from 68 to 90 minutes, with an average of (75.26 ± 4.82) minutes. The Body Mass Index (BMI) ranged from 20.5 to 24.5 kg/m², with an average of (22.03 ± 0.46) kg/m². The preoperative Activated Partial Thromboplastin Time (APTT) ranged from 25.8 to 32.5 seconds, with an average of (28.29 ± 2.03) seconds. The age of the research group ranged from 50 to 65 years old, with an average of (58.56 ± 3.75) years old. Disease types: 1 case of endometriosis, 7 cases of ovarian cysts, 28 cases of uterine prolapse, 3 cases of adenomyosis, and 19 cases of uterine fibroids. The operation duration ranged from 65 to 90 minutes, with an average of (74.48 ± 4.75) minutes. The BMI ranged from 20.5 to 25 kg/m², with an average of (22.06 ± 0.47) kg/m². The preoperative APTT ranged from 25.9 to 32.3 seconds, with an average of (28.31 ± 2.05) seconds. The comparison of the two groups of data showed good balance ($P > 0.05$).

1.2 Inclusion and exclusion criteria

(1) Inclusion criteria: Meeting the diagnostic criteria for benign gynecological diseases such as endometriosis ^[8], ovarian cysts ^[9], uterine prolapse ^[10], adenomyosis ^[11], and uterine fibroids ^[12]; Meets the indications for laparoscopic total hysterectomy; During the operation, the anesthesia protocol of Endotracheal Tube general anesthesia (ETT) was adopted. No previous history of laparoscopic surgery; The clinical and follow-up data are complete. There was no previous thromboembolic disease or peripheral vascular disease. (2) Exclusion criteria: Concurrent malignant tumor diseases or severe underlying diseases; Combined with mental disorders; Having suffered from severe traumatic diseases in the past or having undergone major surgeries within the last six months; American Society of Anesthesiologists (ASA) grades IV and v; Preoperative ultrasound examination indicated that DVT had already formed in both lower extremities or there was venous return disorder in the lower extremities. Combined with severe postoperative complications or a history of hypertension and diabetes; There is inflammation in the local acupoint skin. Anticoagulant drugs have been used within the past month.

1.3 Methods

1.3.1 Control Group Receive routine perioperative care: Before the operation, carry out knowledge education on the prevention of DVT. After the operation, remind the patient to drink plenty of water. Promote the venous return of the lower extremities through methods such as elevating the affected limb, local hot compress, elastic stockings, and intermittent compression and inflation devices. Use anticoagulant drugs as prescribed by the doctor. Strengthen the observation of lower extremity temperature and skin color. Guide the patient to get out of bed and move around as soon as possible after the operation Early rehabilitation ex-

ercises should be carried out (ankle pump exercises such as plantar flexion, dorsiflexion and circular movements of the ankle joint should be performed 24 hours after the operation, and knee joint extension and flexion, leg raising and other activities should be moderately carried out 3 days after the operation, as long as the patient can tolerate it). Provide care until discharge.

1.3.2 Research Group Received conventional perioperative care (the same as the control group) + preventive acupoint massage based on the ERAS concept: (1) Acupoint selection: Zusanli, Sanyinjiao, Taichong, Xuehai, Yanglingquan. (2) Massage operation: ① Starting from 6 to 12 hours after the operation, a combination of kneading, pressing and tapping techniques is used to massage both lower limbs, adhering to the principle of softness and penetration. The patient lies flat. The nurse kneads with both hands to warm them up, starting from the root of the thigh to the distal end of the calf, using the heel of the palm to perform circular kneading to relax the muscles, for about 1 minute. ② Massage the five acupoints of Taichong, Sanyinjiao, Zusanli, Yanglingquan and Xuehai on both lower limbs in sequence from bottom to top. Use the pad of the thumb to press the acupoints vertically. Press each acupoint for 30 seconds and then massage in a circular motion for 30 seconds. Repeat 2 to 3 sets. The massage force should gradually increase from light to heavy, and be continuous and uniform. The patient should feel soreness, distension, numbness and pain. After the acupoint pressing was completed, the nurse once again used the heel of her palm to push and massage the meridians from the thigh to the calf, gently pinching the triceps of the calf and the quadriceps of the thigh to relax the muscles for about 1 minute. Massage for about 20 minutes each time, twice a day. Provide care until the patient is discharged from the hospital. After discharge, guide family members to help the patient with massage until 90 days after the operation.

1.4 Observation

Indicators (1) Blood flow velocity of the deep vein in the affected lower extremity: Before the operation and 7 days after the operation, color Doppler ultrasound (Shenzhen Mindray Medical, model :DC-N2S, Guangdong Medical Device Registration No. 20172061361) was used to measure the Common Femoral Vein (CFV) and Superficial Femoral Vein (Superficial Femoral Vein) of the affected lower extremities in both groups. The blood flow velocities of SFV and Popliteal Vein (PV) were measured three times repeatedly at the same site to reduce errors, and the average value was taken as the final result. (2) Degree of swelling in the affected lower extremity: At 16:00 before the operation and 7 days after the operation, the circumference of the thigh (10cm above the patella) and the circumference of the lower leg (10cm below the patella) of the two groups of affected limbs were measured respectively using a medical tape measure (tianjin huajian orthopedic instruments, tianjin food and drug supervision medical device (standard) No. 1100058 2010), keeping the tape measure perpendicular to the long axis of the thigh. The tightness should be such that it just adheres to the

skin without any subcutaneous tissue. (3) Nursing satisfaction and the incidence of lower extremity DVT within 3 months after surgery. Before the patients were discharged from the hospital, a self-made gynecological patient nursing satisfaction survey questionnaire was used to assess the nursing satisfaction. The questionnaire included 20 items such as admission reception, sense of responsibility, and nursing operation skills, with a total score of 100 points. Scores less than 80 points, 80 to 95 points, and > 95 points were respectively regarded as unsatisfactory, basically satisfied, and very satisfied. Nursing satisfaction rate = (number of very satisfied cases + number of basically satisfied cases)/total number of cases $\times 100\%$. The patients were followed up for 3 months after the operation, and the incidence of lower extremity DVT within 3 months after the operation was evaluated based on the relevant expert consensus ^[13].

1.5 Statistical methods:

SPSS23.0 software was used. Measurement data were expressed as ($\bar{x} \pm s$) and analyzed by t-test. Counting data were expressed as n (%) and analyzed by χ^2 test. A P value < 0.05 was considered statistically significant.

2 Results

2.1 Blood flow velocity of the deep vein in the affected lower extremity Compared with the preoperative conditions of this group, the blood flow velocities of CFV, SFV and PV in the affected lower extremity of both groups increased 7 days after the operation ($P < 0.05$), and compared with the control group, the blood flow velocities of CFV, SFV and PV in the affected lower extremity of the study group were higher ($P < 0.05$). See **Table 1**.

Table 1. Comparison of blood flow velocity of deep vein in the affected side of lower extremity between the two groups before and 7 days after operation ($\bar{x} \pm s$, cm/s)

Group	n	CFV		SFV		PV	
		Preoperative	Postoperative day 7	Preoperative	Postoperative day 7	Preoperative	Postoperative day 7
Research group	58	16.44 $\pm$ 1.32	20.23 $\pm$ 2.08*	12.37 $\pm$ 1.26	16.41 $\pm$ 1.97*	11.59 $\pm$ 1.13	15.62 $\pm$ 1.79*
Control group	58	16.51 $\pm$ 1.45	18.66 $\pm$ 1.92*	12.29 $\pm$ 1.35	14.28 $\pm$ 1.63*	11.74 $\pm$ 1.18	13.74 $\pm$ 1.61*
t		0.272	4.224	0.330	6.344	0.699	5.947
P		0.786	<0.001	0.742	<0.001	0.486	<0.001

Note: Compared with this group before operation, * $P < 0.05$

2.2 Degree of swelling in the affected lower limb Compared with the preoperative conditions of this group, the circumferences of the affected thigh and calf in both groups increased 7 days after the operation ($P < 0.05$), but the circumferences of the affected thigh and calf in the study group were smaller than those in the control group ($P < 0.05$). See **Table 2**.

Table 2. Comparison of thigh circumference and calf circumference before and 7 days after operation between the two groups ($\bar{X} \pm s$, cm)

Group	n	Thigh Circumference		Calf Circumference	
		Preoperative	Postoperative day 7	Preoperative	Postoperative day 7
Research group	58	45.73±1.21	46.38±1.49*	31.97±1.18	32.51±1.37*
Control group	58	45.68±1.25	46.97±1.31*	32.03±1.22	33.24±1.45*
t		0.219	2.265	0.269	2.787
P		0.827	0.025	0.788	0.006

Note: Compared with this group before operation, *P<0.05

2.3 Nursing satisfaction and the incidence of lower extremity DVT within 3 months after surgery Compared with the control group, the nursing satisfaction of the study group was higher, and the incidence of lower extremity DVT within 3 months after the operation was lower ($P < 0.05$). See **Table 3**.

Table 3. Comparison of nursing satisfaction and incidence of DVT in lower limbs within 3 months after operation between the two groups n(%)

Group	n	Very satisfied	Moderately satisfied	Dissatisfied	Overall satisfaction rate	Incidence of DVT
Research group	58	50(86.21)	8(13.79)	0(0.00)	58(100.00)	1(1.72)
Control group	58	39(67.24)	12(20.69)	7(12.07)	51(87.93)	9(15.52)
χ^2					5.473	7.004
P					0.019	0.008

3 Discussion

Numerous studies have shown that patients after laparoscopic total hysterectomy have a relatively high risk of lower extremity DVT. Traditional Chinese medicine acupoint massage has a meridian conduction effect, which is in line with the physiological function characteristics of middle-aged and elderly patients and is consistent with the ERAS concept. Exploring the perioperative management of integrated traditional Chinese and Western medicine has become a potential innovative research direction for DVT prevention under the ERAS concept^[14].

The results of this study show that compared with the control group, the CFV, SFV and PV blood flow velocities of the affected lower extremity in the study group were faster 7 days after the operation, while the circumference of the affected thigh and calf was smaller. This suggests that preventive acupoint massage based on the ERAS concept can improve the deep vein blood flow velocity and lower extremity swelling degree of the affected lower extremity in patients undergoing gynecological laparoscopic surgery after the operation. The analysis of the reasons lies in: (1) The main reasons for the slow deep vein blood flow in patients undergoing laparoscopic surgery after the operation include the obstruction of vena cava return due to the compression of CO₂ pneumoperito-

neum during the operation, the reduced contraction of the gastrocnemius muscle and quadriceps femoris caused by postoperative immobilization, the inactivation of the "muscle pump" function, and the difficulty of spontaneous venous blood return, etc. ^[15] Starting from 6 to 12 hours after the operation, massage acupoints such as Zusanli in the quadriceps region and Yanglingquan, the origin of the gastrocnemius muscle, and use point pressing techniques. This can stimulate and induce rhythmic contractions of the bones and muscles. During the systolic period, deep veins such as CFV and SFV can be squeezed to promote blood flow to the heart. During the diastolic period, negative pressure is formed in the veins to draw blood from the distal end to fill it, strengthening the function of the "muscle pump". Increase the blood flow velocity of deep veins [16-17]. (2) Massaging acupoints can activate acupoint receptors, which are conducted through afferent nerves to the spinal cord and hypothalamus, inhibiting the excitability of the sympathetic nerve, thereby reducing the release of norepinephrine and lowering vascular contractile tension. At the same time, it can enhance the activity of the parasympathetic nerve, releasing acetylcholine through efferent fibers such as the vagus nerve, and promoting the release of active substances such as nitric oxide and prostacyclin by the vascular endothelium. Relaxing the smooth muscle of veins promotes the thickening of venous diameters, thereby reducing venous blood flow resistance and accelerating blood flow ^[18]. (3) Acupoint massage is beneficial for promoting venous blood flow. An increase in venous blood flow velocity can raise the venous pressure gradient, facilitating the reabsorption of tissue fluid through the capillary venous end. In addition, acupoint massage can stimulate the lymph node area in the groin and the lymphatic network of the lower extremities (such as the lymphatic vessels near Yanglingquan). Muscle contraction compresses the lymphatic vessels, increasing the centripetal flow of lymph fluid and reducing the retention of tissue fluid, thereby alleviating swelling in the lower extremities ^[19].

The results of this study show that the incidence of lower extremity DVT within 3 months after nursing in the study group was lower than that in the control group, and the nursing satisfaction was higher than that in the control group. This suggests that preventive acupoint massage based on the ERAS concept can reduce the risk of lower extremity DVT in patients undergoing gynecological laparoscopic surgery and improve nursing satisfaction. The reason for this is that the Zusanli point belongs to the Foot Yangming Stomach Meridian and is a key point for strengthening the body. It can promote the generation and circulation of qi and blood. Massaging the Zusanli point can cause the gastrocnemius muscle to contract rhythmally, acting as a muscle pump, thereby effectively promoting the dilation of capillaries and small veins ^[20]. The Taichong acupoint belongs to the Foot Jueyin Liver Meridian and has the functions of soothing the liver and unblocking the meridians, regulating qi and blood, etc. Massaging and stimulating the Taichong acupoint can activate the branches of the tibial nerve, and through the "axon reflex", promote the release of nitric oxide by the vascular endothe-

um, relax the smooth muscle of the veins, and reduce blood flow resistance. The Sanyinjiao acupoint is the convergence point of the liver, spleen and kidney meridians. It has the functions of harmonizing the qi and blood of the three meridians and promoting the circulation of dampness and water. Massaging the Sanyinjiao acupoint can stimulate the branches of the saphenous nerve, promoting the secretion of prostacyclin by the vascular endothelium, and exerting the dual effects of dilating veins and inhibiting platelet aggregation. Acupoint massage is based on the theory of meridians and qi and blood. By applying the techniques of tapping, pressing and kneading to the corresponding acupoints on the affected side of the limb, it can work in concert to activate the muscle pump, prevent blood accumulation in the lower extremities, improve blood circulation in the lower extremities, thereby reducing the risk of DVT occurrence and enhancing the effect and satisfaction of nursing care.

In conclusion, preventive acupoint massage based on the ERAS concept can improve the deep vein blood flow velocity of the affected lower extremity and the degree of swelling of the affected lower extremity in patients undergoing gynecological laparoscopic surgery after the operation, reduce the risk of lower extremity DVT, and the nursing satisfaction is relatively high.

References

- [1] Miao Yuan, Zhang Shuwen, Wang Yanfang, et al. Construction of a risk prediction model for deep vein thrombosis of the lower extremities in patients with uterine fibroids after laparoscopic surgery [J] *Journal of Nursing Management*, 24, 24(2): 166-169, 184.
- [2] Qiu Wenjuan, Zhang Min, Wang Mei. Establishment and Evaluation of regression prediction Model for Deep vein thrombosis of Lower Extremities after laparoscopic ovarian cystectomy [J] *Chinese Journal of Family Planning*, 24, 32(2): 436-440.
- [3] Bai Xiaoyan, Tai Xiuli, Zhang Yufeng. The effect of air pressure wave combined with conventional measures in preventing deep vein thrombosis of the lower extremities in patients with gynecological benign tumors after laparoscopic surgery [J]. *Journal of Clinical and Pathological Studies*, 2022, 42(9): 2152-2158.
- [4] Yong Yuanyuan, Yong Tiaotiao, Sana Mushtaq, et al. Clinical research on Enhanced Recovery after Surgery in Robot-assisted laparoscopic pelvic floor Reconstruction [J] *Journal of Robotic Surgery (Chinese and English)*, 2020, 6(3): 416-420.
- [5] Liu Ting, Chen Weiyuan, Zhong Yan, et al. Application Research of Enhanced Recovery after Surgery Management Model in Laparoscopic Ovarian Castration [J]. *Journal of Laparoscopic Surgery*, 24, 29(4): 302-307.
- [6] Tian Ning, Xu Zhengjun, Li Feng, et al. The influence of continuous nursing under the concept of enhanced recovery after surgery on postoperative recovery, sleep quality and emotional status of patients undergoing laparoscopic hysterectomy [J]. *Journal of Clinical and Pathological Studies*, 2023, 43(3): 580-586.
- [7] Li Jie, Shi Gailing, Zhang Jingya. Research on Gastrointestinal Function Recovery and Pain Management of Patients Undergoing Laparoscopic Colectomy Based on the Concept of Enhanced Recovery after Surgery with Traditional Chinese Medicine Characteristic Nursing [J] *Joint Military Medicine*, 2020, 39(5): 440-444.
- [8] Obstetrics and Gynecology Physicians Branch of Chinese Medical Doctor Association, Endometriosis Collaboration Group of Obstetrics and Gynecology Branch of Chinese Medical Association. *Diagnosis and Treatment Guidelines for endometriosis (Third Edition)* [J]. *Chinese Journal of Obstetrics and Gynecology*, 2021, 56(12): 812-824.
- [9] Gynecological Oncology Group, Obstetrics and Gynecology Branch, Chinese Medical Doctor Association.

Chinese Expert Consensus on Diagnosis and Treatment of Ovarian Cysts (2022 Edition)[J]. Chinese Journal of Practical Gynecology and Obstetrics,2022,38(8):814-819.

[10] Gynecology and Pelvic Floor Group, Obstetrics and Gynecology Branch, Chinese Medical Association. Chinese Guidelines for Diagnosis and Treatment of Pelvic Organ Prolapse (2020 Edition) [J]. Chinese Journal of Obstetrics and Gynecology,2020,55(5):300-306.

[11] Endometriosis Professional Committee, Obstetrics and Gynecology Branch, Chinese Medical Doctor Association. Chinese Expert Consensus on Diagnosis and Treatment of Adenomyosis [J]. Chinese Journal of Obstetrics and Gynecology,2020,55(6):376-383.

[12] Expert Group of the Chinese Consensus on the Diagnosis and Treatment of Uterine Fibroids. Chinese Expert Consensus on the Diagnosis and Treatment of Uterine Fibroids [J]. Chinese Journal of Obstetrics and Gynecology,2017,52(12):793-800.

[13] Chinese Venous Intervention Alliance, Peripheral Vascular Intervention Professional Committee of Interventional Physicians Branch, Chinese Medical Doctor Association. Expert Consensus on Nursing Standards for Interventional Therapy of Deep Vein Thrombosis of the Lower Extremities [J]. Journal of Interventional Radiology,2020,29(6):531-540.

[14] Shi Yingchun, Wang Yuan, Chen LAN, et al. The nursing effect of FTS concept in the perioperative period of laparoscopic total hysterectomy [J]. China Medical Review,2021,18(35):174-176.

[15] Liang Shanshan, Yang Lu, Meng Yu, et al. Influencing factors of lower extremity deep vein thrombosis in patients undergoing laparoscopic total hysterectomy under general anesthesia [J]. Journal of Vascular and Endovascular Surgery,2023,9(10):1246-1249,1259.

[16] Tu Jie, Sun Yongkang, Zhong Xueling, et al. A randomized controlled study on the immediate effect of Ultrasound-guided acupuncture at Zusanli Point on Lower Extremity Arterial Blood flow [J] Chinese Journal of Integrated Traditional Chinese and Western Medicine,2024,44(12):1437-1442.

[17] Chen Jing, Li Shuxian, Ning Yile, et al. The mechanism of acupuncture at Zusanli in preventing and treating sepsis-induced muscle atrophy by regulating the ROCK1/AKT signaling pathway [J]. Chinese Journal of Traditional Chinese Medicine,2023,41(11):123-126.

[18] Dai Wei, Liu Dong, Kuai Naihong, et al. The influence of preoperative acupoint massage combined with music therapy on stress response and complications in patients undergoing laparoscopic bariatric surgery [J]. International Journal of Nursing,2021,40(8):1407-1410.

[19] Bu Shengnan The preventive effect of acupoint electrical stimulation on postoperative deep vein thrombosis of the lower extremities in patients with gynecological diseases [J]. Chinese Journal of Modern Nursing,2021,27(26):3583-3586.

[20] Yang Xiaopeng, Li Jinfeng, Zhang Yongjun, et al. The analgesic effect of acupuncture at Zusanli and Neiguan points after hip replacement in the elderly and its influence on serum inflammatory factors [J]. Chinese Journal of Traditional Chinese Medicine,2024,42(1):226-229.