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Table of Contents

Proceedings of Anticancer Research, 2021, Volume 5, Issue 3
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Understanding and Treatment of Peripheral Neurotoxicity Induced by Chemotherapy

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Abstract: This paper analysis chemotherapy-induced peripheral neuropathy (CIPN) caused by related chemotherapeutic drugs and proposes some treatments from nursing intervention to drug treatment. It also calls for more efforts in the research of this field to relieve psychological burden and improve quality of life of patients at the end of the paper.

Key words: CIPN; Neurotoxicity; Treatment

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In recent years, the age of cancer onset has a trend of low age, and the gender difference is shrinking, which seriously affects human health and life expectancy. As a traditional anti-tumor method, chemotherapy cannot accurately identify tumor cells and kill normal cells at the same time. In the process of treatment, it often produces a series of toxic and side effects. With the application of platinum, taxanes, alkaloids, fluorouracil and other chemotherapy drugs, chemotherapy-induced peripheral neuropathy (CIPN) has gradually become a common clinical side effect, affecting the use of chemotherapy drugs and clinical efficacy, affecting the quality of life of patients, and even forced to terminate chemotherapy. Western medicine for CIPN mainly includes calcium and magnesium, sodium channel blockers, vitamins, etc., which can relieve symptoms to a certain extent, but the effect is not satisfactory.

1 CIPN caused by related chemotherapeutic drugs

Cisplatin and Oxaliplatin are the main platinum compounds that cause CIPN. Cisplatin (DDP) is widely used in clinic. Its anti-tumor mechanism is to inhibit DNA replication and transcription, inhibit tumor cell proliferation and induce tumor cell apoptosis[2]. Oxaliplatin (OXA) is the third-generation platinum anticancer drug, which is commonly used in the treatment of digestive system malignant tumors. The antitumor spectrum is similar to cisplatin, and there is no cross resistance between them, but it has stronger cytotoxicity, and the incidence of peripheral neurotoxicity is as high as 85%-95%[3].

1.1 Peripheral neurotoxicity induced by cisplatin

Studies have shown that the higher the cumulative dose of cisplatin is, the higher the incidence of peripheral neurotoxicity is. When the cumulative dose reaches 300mg / m^2, 45% of the patients have peripheral neurotoxicity, and when the cumulative dose reaches 500-600 mg/m^2, almost 100% of the patients have peripheral neurotoxicity symptoms. This study also points out that the peripheral neurotoxicity caused by cisplatin is mostly reversible and recovers in more than 15 weeks[4].

1.2 Oxaliplatin induced peripheral neurotoxicity

Oxaliplatin induced peripheral neurotoxicity is related to the cumulative dose. According to its clinical manifestations, it can be divided into two categories. One is acute neurotoxicity, which can occur within a few hours or 1-2 days after administration, and generally lasts for no more than 7 days. It is often induced or aggravated by cold stimulation. The main manifestations are peripheral nerve paralysis or defect, such as mild finger (toe) end or perioral paresthesia, dullness or tenderness. The periodic use of

drugs may cause repeated symptoms. There are also patients with acute laryngeal spasm, but it is very rare. The second is chronic neurotoxicity, with slow onset and long course of disease. In the early stage, it is mainly manifested as numbness and paresthesia. In the later stage, it may appear sensory loss, accompanied by ataxia and dysfunction, and finally progress to physical dysfunction[5].

1.3 Taxanes induced peripheral neurotoxicity

Paclitaxel induced peripheral neurotoxicity generally occurs within 3 days after medication, about 30.1% of patients have grade I-II neurotoxicity, and 10% of patients have grade III-IV neurotoxicity[6]. The typical clinical manifestations are glove sock numbness and burning sensation at the end of limbs. A small number of patients have decreased vibration and disappeared deep tendon reflex. In severe cases, symptoms such as sensory loss and tremor paralysis may appear at the distal end of limbs, showing symmetry[7].

2 Treatment of peripheral neurotoxicity caused by chemotherapy

2.1 General methods and nursing intervention

As OXA induced peripheral neurotoxicity is often induced or aggravated by cold stimulation, patients should be advised to keep warm before and after chemotherapy and avoid contact with low-temperature articles and cold air. At the same time, the time of intravenous infusion should be controlled to avoid the highest concentration of drugs in plasma. Patients with acute neurotoxicity should be controlled at 2-3 hours, and patients with chronic neurotoxicity should be prolonged to 6 hours[8]. For chronic neurotoxicity caused by OXA, the "stop and go" strategy of intermittent use of Oxaliplatin is currently used in clinic to improve the threshold of cumulative dose of neurotoxicity. In the route of administration, changing the route of administration can reduce the peripheral nerve injury of chemotherapy drugs and reduce the incidence of CIPN.

2.2 Drug treatment

At present, there is no unified standard for the treatment of CIPN in western medicine, mainly drug treatment, including calcium and magnesium, antioxidant and so on.

2.2.1 Total calcium and magnesium

Calcium and magnesium are commonly used in the prevention and treatment of CIPN, which can avoid or reduce the effect of OXA on neural membrane channels. Sodium channels can be changed by calcium ions, and then sodium influx increases. Magnesium sulfate can reduce the stress of nerve fibers, restore the function of ATPase, and facilitate the operation of sodium pump.

2.2.2 Sodium channel blockers

The acute neurotoxicity induced by OXA is closely related to the transient changes of sodium channels. The toxic and side effects of OXA can be alleviated by sodium channel blockers, which has been confirmed by many studies.

2.2.3 Antioxidants

Antioxidants are another research direction of CIPN control, including reduced glutathione (GSH), amifostine (Amifostine for injection) and α - lipoic acid.

GSH can promote the formation of low toxic compounds which are easy to metabolize and reduce the toxicity of some exogenous poisons. GSH is a neuromodulator, known as scavenger of free radicals, which can prevent platinum drugs from accumulating on DRG and has a protective effect on neurons[10].

3 Conclusion

Chemotherapy induced peripheral neurotoxicity (CIPN) is worthy of our attention. Mild CIPN results in increased psychological burden and decreased quality of life of patients, and severe CIPN results in chemotherapy pause, which seriously affects the treatment process of malignant tumor. We expect more researchers to invest in CIPN and get better treatment plan, so as to reduce the psychological and physiological burden of patients with malignant tumor and continue the chemotherapy plan.

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Professor Wang Xisheng's Thoughts on Tumors and "Fu Yuan Fu Heng Method" for the Treatment of Malignant Tumors

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Abstract: According to the report of the National Cancer Center, there are about 4.5 million new cancer patients and 3 million deaths in China every year. How to effectively implement a comprehensive system of prevention and control measures and reduce the incidence rate of malignant tumors in the country, so that the mortality rate of cancer is effectively controlled is a problem that needs to be solved urgently. In particular, it is worth mentioning that in China, the addition of traditional Chinese medicine in the treatment of malignant tumor plays an important role in improving the therapeutic effect, reducing the toxic and side effects of comprehensive treatment, improving the quality of life, and "survival with tumor" of end-stage cancer patients. Professor Wang Xisheng has been engaged in the field of traditional Chinese medicine in the treatment of cancer for more than 40 years. In his long-term clinical practice, he has accumulated rich experience in the prevention and treatment of malignant tumors. This article introduces Professor Wang's thinking on cancer in clinical practice and the "Fu Yuan Fu Heng method" in the treatment of malignant tumors for reference.

Key words: Thinking about tumor; Fuyuan Fuheng Decoction; Cancer treatment

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1 Some thoughts on tumor

1.1 What is a tumor?

Modern medicine believes that tumor is a new organism formed by abnormal gene expression and abnormal cell proliferation caused by a variety of tumorigenic factors [1]. After malignant tumor cells form, they are no longer regulated by the normal regulatory mechanism of the human body, cause damage to normal tissues and organs, and seriously endanger human health. The earliest description of "tumor" in traditional Chinese medicine can be traced back to Oracle Bone Inscriptions in the Yin and Shang Dynasties. Due to the deficiency of Qi, blood stasis, and accumulation of symptoms, the function of viscera is out of balance; Or by the body movement of dereliction of duty, phlegm condensation, gas and phlegm accumulation does not disperse; The interaction of blood stasis, phlegm turbidity and pathogenic toxin will lead to cancer. Professor Wang thought: Tumor is a natural thing, and its survival depends on the human body. Since tumor is a kind of existence, philosophically speaking, "existence is reasonable", it seems that there should be a reason for its existence, but human beings have not found it, let alone observed and studied it. What exactly is a tumor for? Why does it exist? Is cancer always harmful to human body? Why do we have the idea of "survival with tumor"?

1.2 Why do you get tumors?

Why do people get tumors? Is it related to population, age, gender, status, poverty and wealth? Based on current population with cancer, it is shown that etiology of cancer is often unknown, and the incidence is random. The method theory of traditional Chinese medicine is rooted in Chinese

culture[3]. Inspired by traditional cultural ethics, Professor Wang tried to explain why people get tumors by using the nature, instinct, disposition and attributes of all natural things. Professor Wang often gives examples. This is the nature of human beings. Fish are not easily affected by dampness. It seems that cancer patients themselves have the possibility of suffering from cancer. It can also be said that this kind of people suffering from cancer is inevitable, which is determined by nature, nature, disposition and destiny. Modern genetic medicine and preventive medicine involved in genetic engineering, gene testing confirmed that genetic mutation is directly related to the occurrence of some diseases, also confirmed the nature of suffering from a certain disease[4].

1.3 How to face cancer?

Professor Wang thinks that since cancer is an objective existence, we must face it calmly when facing diseases like cancer. It is inevitable for people to get sick. Some people are born disabled, which does not affect their normal life. Correct understanding of the disease, reducing the ideological burden, strengthening nutritional care, maintaining a good attitude, increasing rest time, maintaining moderate exercise, timely symptomatic treatment after symptoms are helpful for the treatment and recovery of tumor.

1.4 How to treat tumor?

Benefiting from the continuous development of basic disciplines and biological science and medical technology, significant progress has been made in the research of tumor etiology, pathogenesis, treatment and prevention, and new drugs, new technologies and new therapies have come out one after another[5-6]. Professor Wang believes that although there are many treatments, the mortality rate is still high. The difficulty of tumor treatment lies in that each treatment has its limitations. It is impossible to cure the tumor by a single method. Although the treatment has benefits, it should be stopped when it does too much harm to the body. For cancer treatment is not to eliminate tumor cells as the primary goal, but to promote appropriate adjustment to mobilize the body's ability of self-recovery, self-resistance and self-regulation.

2 Fuyuan Fuheng Decoction in the treatment of malignant tumor

Human is a product of nature. As a part of nature, Professor Wang thinks that human body has wonderful structure and perfect function[7]. Corresponding to the external heaven, earth and human beings, they have the same Qi, isomorphism and law with nature. They conform to nature, adapt to nature, make use of nature, integrate the internal form and spirit, self-adjust, self-renew and self-repair, conform to the time, and live to the age of heaven[8]. According to Tao Te Ching, the best state of human existence is harmony. The balance of Qi and blood, yin and Yang, viscera and body fluid is particularly important to maintain health. Professor Wang believes that Yuanqi can adjust the balance of viscera, Qi and blood, body fluid, meridians and Qi mechanism, maintain the balance and coordination of viscera and meridians function, harmonize qi and blood, enrich body fluid, and keep Qi mechanism up and down. Traditional Chinese medicine can help to alleviate the pain of patients, restore the regulatory role of vitality, regulate and conform to the homeostasis of human body, promote the ability of self-healing and self-defense of human body, and make tumor and human coexist harmoniously. Thus, the idea of "Fu Yuan Fu Heng" runs through the whole process of tumor treatment and rehabilitation. "Fu Yuan" is to improve the "deficiency of vital energy" of cancer patients, and "Fu Heng" is to restore the balance of patients by supporting vital energy.

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Clinical Analysis of Gemcitabine Combined with Tegafur Chemotherapy after Radical Surgery on Pancreatic Cancer

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[Abstract] ***Objective:*** To study and analyze the clinical efficacy of gemcitabine combined with Tegafur chemotherapy after radical resection of pancreatic cancer. ***Methods:*** The subjects of the study were 200 patients who were admitted to the hospital from January 2018 to February 2021 requiring chemotherapy after radical resection of pancreatic cancer. According to the different treatment methods, they were divided into a experimental group (gemcitabine combined with Tegafur chemotherapy) and a control group (single gemcitabine chemotherapy), and the treatment efficacy of the two groups of patients was observed and compared. ***Results:*** Compared with the control group, patients in the experimental group had significantly better treatment efficacy, quality of life scores and post-treatment anxiety and depression scores. The difference between the groups was significant ($p<0.05$). ***Conclusion:*** Gemcitabine combined with Tegafur chemotherapy for patients requiring chemotherapy after radical resection of pancreatic cancer can significantly improve the treatment efficacy for the disease, improve the patient's quality of life, and ensure that the patient's emotional state during treatment is more positive.

Key words: Radical resection of pancreatic cancer; Gemcitabine; Tegafur; Chemotherapy; Clinical efficacy

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As a malignant tumor disease, pancreatic cancer has a relatively high degree of malignancy. The clinical manifestations of patients are mainly abdominal pain. The risk factors for the disease include diabetes and long-term history of smoking and drinking. At present, chemotherapy is mainly used to improve the patient's conditions in clinic, but chemotherapy can cause various complications, so the chemotherapy scheme needs to be optimized. Single-drug chemotherapy is often used clinically, and combination drugs are now being considered for chemotherapy[1]. The research content of this paper is the clinical efficacy of gemcitabine combined with Tegafur chemotherapy after radical resection of pancreatic cancer. The following results were obtained:

1 General information and methods

1.1 General information

In this study, our hospital selected 200 patients who needed chemotherapy after radical resection of pancreatic cancer and divided them into two groups by random number table method. In the 100 cases control group, the male to female ratio was 4:6, and the average age was (55.9±6.4) years. The male to female ratio of the 100 patients in the experimental group was 5:5, and the average age was (57.4±8.1) years. There was no significant difference in age and gender between the two groups of patients ($P>0.05$). All the enrolled patients were aware of the study, volunteered to participate in it, and signed an informed consent. The patients were mentally clear and sane, and could accurately answer relevant research questions raised by the researchers, with no other serious life-threatening complications except for this disease. The excluded patients were very resistant to this study, or had other serious life-threatening diseases or could not answer the questions accurately. Or the family members of the patients were resistant to this study and refused to participate in the study. Or the patients were

transferred to other hospitals or dropped out directly during the study[2]. The study was officially launched after obtaining the permission of the hospital ethics committee.

1.2 Treatment methods

Patients in the control group received gemcitabine treatment alone and received intravenous infusion of gemcitabine (National Medicine Zhunzi H20030105), and the experimental group received Tegafur on top of the above basis, and intravenous infusion of Tegafur (National Medicine Zhunzi H20080802) was administered. The duration of a course of treatment was set to 8 days, and the treatment efficacy was compared after all patients received 4 courses of treatment.

1.3 Observation items and indices

1.3.1 Assessment criteria for treatment efficacy

(1) Markedly effective: Various adverse symptoms have basically disappeared and no serious complications have been observed; (2) Effective: Various adverse symptoms have been improved, and the complications have been significantly improved after symptomatic treatment; (3) Ineffective: Those who do not meet the above criteria.

1.3.2 Quality of life assessment criteria

In-house quality of life questionnaires were distributed to the patients to fill in anonymously; valid questionnaires were collected on site, and the quality of life scores were compiled. The questionnaire was divided into 4 major items, each accounting for 25 points, with a full score of 100 points. The higher the score, the higher the patient's quality of life.

1.3.3 Anxiety and depression scoring criteria

It was evaluated by the Anxiety and Depression Score Scale. The higher the score, the heavier the negative emotion of the patient.

1.4 Statistical method

For the data and information involved in this study, SPSS20.0 statistical software was used for analysis and processing.

2 Results

2.1 Comparison on the treatment efficacy between the two groups of patients

The statistical results showed that the treatment efficacy of the experimental group was higher than that of the control group, and there were significant differences between the groups (P<0.05), which was statistically significant. See Table 1 for details.

Table 1. Comparison on the Treatment Efficacy between the Two Groups of Patients (n, %)

Group	Markedly Effective	Effective	Ineffective	Efficacy
Experimental (n=100)				95.0%（95/100）
Control (n=100)	90	5	5	83.0%（83/100）
X^2	73	10	17	8.524
P				P<0.05

2.2 Comparison on the life quality scorings between the two groups of patients

The statistical results show that the scores of physical functions, emotional functions, social functions and mental health of the experimental group were significantly higher than those of the control group. There were significant differences between the groups (P<0.05), which was statistically significant. See Table 2 for details.

Table 2. Comparison on the Life Quality Scorings between the Two Groups of Patients (pts, x±s)

Group	Physical Functions	Emotional Functions	Social Functions	Mental Health
Experimental (n=100)	89.48±6.14	93.38±5.56	91.52±5.13	92.38±5.11
Control (n=100)	72.45±6.16	84.86±0.62	82.57±5.11	81.06±4.12
t	8.174	5.358	8.527	9.358
P	<0.05	<0.05	<0.05	<0.05

2.3 Comparison on the anxiety and depression scores before and after treatment between the two groups of patients

The statistical results show that before treatment, the anxiety and depression scores of the two groups of patients were higher, and there was no significant difference between the

groups (P>0.05). After respective therapies, the scores of the two groups were reduced, and the experimental group was significantly lower than the control group, there were significant differences between the groups (P<0.05), which were statistically significant. See Table 3 for details.

Table 3. Comparison on the anxiety and depression scores before and after treatment between the two groups of patients (x±s)

Group	Anxiety (before treatment)	Anxiety (after treatment)	Depression (before treatment)	Depression (after treatment)
Experimental (n=100)	22.38±5.47	15.82±4.14	25.32±4.03	16.38±4.54
Control (n=100)	22.86±5.12	18.55±4.45	25.02±5.31	19.86±5.12
t	0.174	9.358	0.527	9.402
P	>0.05	<0.05	>0.05	<0.05

3 Discussion

At present, the cause of pancreatic cancer has not been clearly studied clinically, and the possible influencing factors include pathological changes in the pancreatic duct, pancreatic vesicles and islets. After contracting the illness, patients will have different degrees of pain, accompanied by symptoms such as loss of appetite and overall weakness, and their normal daily life is severely affected[3]. Chemotherapy can effectively improve adverse symptoms, and patients have a high degree of acceptance of treatment. However, during the actual application of chemotherapy, the therapeutic effect is often affected by the disease and the patient's own factors. For example, when the patient is receiving treatment, the condition is often already very serious, the physique is poor, and the body's immunity is extremely low. Therefore, the risk of chemotherapy is higher[4].

In recent years, some scholars have found through research that the common influencing factors of pancreatic cancer include pancreatic islet shadow and cancer cell composition, etc. If the optimal treatment time is missed, it will aggravate the necrosis of pancreatic tissue and threaten the life of patients[5]. When only one drug is administered in chemotherapy, the disease progression can only be controlled, but the disease cannot be eradicated. Therefore, the combination of drugs to treat the disease has been considered clinically. The selected treatment drug needs to have a significant analgesic effect to ensure that the patient can relieve body pain in a short time after taking the drug[6]. In addition, the selected drugs also need to improve the patient's body immunity and prevent other diseases.

Tegafur is a compound chemotherapeutic drug with high targeting specificity. In addition to killing cancer cells quickly, it can also avoid damaging cells and tissues of the body[7]. It has a very wide range of clinical applications and is highly recognized. It is often used for gastric cancer, head and neck tumors, colon cancer and pancreatic cancer that cannot be treated by surgery. The curative effect is very prominent. Moreover, the drug can effectively enhance the anti-cancer activity, and the toxicity to the body is lower. In addition, the drug is very convenient to administer[8]. When gemcitabine is combined with Tegafur chemotherapy, the advantages of the two drugs complement each other, and the therapeutic effect is more prominent. The results of this study showed that the treatment efficacy of patients in the experimental group who received combination chemotherapy was significantly higher than that of the control group. The quality of life scores were significantly higher than those of the control group. The anxiety and depression scores after treatment were significantly lower than those of the control group. The differences are prominent (P<0.05) and statistically significant. It has been proved that gemcitabine combined with Tegafur chemotherapy can achieve the expected clinical effect for patients who require chemotherapy after radical resection of pancreatic cancer. It has to be pointed out that as the combination chemotherapy program was only carried out on traditional conventional pancreatic cancer patient samples, and the treatment was aimed at most patients, but in actual applications, there are individual differences between patients, and conventional treatment is more focused on single treatment, therefore lacking systemicity. In addition, as the research was based on a small sample of data, the conclusions obtained may be lacking in persuasiveness. It is expected that large-sample clinical studies can be carried out

again in the future to ensure the persuasiveness of the research conclusions.

In conclusion: the implementation of gemcitabine combined with Tegafur chemotherapy for patients who need chemotherapy after radical resection of pancreatic cancer can significantly improve the treatment efficacy for the disease, improve the patient's quality of life, and ensure that the patient's emotional state during treatment is more positive.

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Observation on the Anesthesia Effect of Ultrasound-Guided Nerve Block for Elderly Patients with Lower Limb Fractures

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[Abstract] ***Objective:*** To explore the anesthesia effect of ultrasound-guided nerve block in elderly patients with lower limb fractures. ***Methods:*** From November 2017 to November 2020, 50 elderly patients with lower limb fractures in our hospital were divided into experimental group (25 cases, general anesthesia + femoral nerve and sciatic nerve block) and control group (25 cases, general body anesthesia). Compare the MAP, HR, anesthesia effect, and adverse reactions between the two groups at each time period. ***Results:*** Before induction, the difference in MAP and HR between the two groups of patients did not form, p>0.05; the MAP and HR of the experimental group were compared with the control group at the time of skin incision, 1 hour during the operation, and removal of the laryngeal mask, P < 0.05; the time of extubation in the experimental group (14.28±3.18) min, awake time (5.57±1.32) min, orientation recovery time (11.89±2.23) min, propofol dosage (191.36±22.48) mg, remifentanil dosage (0.23±0.04) mg, Compared with the control group, P<0.05; the adverse reaction rate of the experimental group (8%, 2/25) was lower than that of the control group (32%, 8/25), P<0.05. ***Conclusion:*** The use of ultrasound-guided femoral nerve and sciatic nerve block for elderly patients with lower limb fractures can enhance the effect of anesthesia, effectively reduce the use of anesthetics, and have fewer adverse reactions. It is worthy of promotion.

Key words: Ultrasound guidance; Nerve block; Lower limb fracture; Anesthesia effect

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The effect of combined spinal-epidural anesthesia for patients with lower limb fractures is ideal and will not affect the cognitive function of the patients. However, there are still some elderly patients who have increased the difficulty of puncture due to the calcification of the ligamentum flavum and bone hyperplasia, and the requirements for intraspinal anesthesia are sideways. Lying position. However, patients with fractures cannot tolerate it because of the strong pain, so it is not suitable for all patients[1]. In addition, general anesthesia with endotracheal intubation can affect the metabolism of drugs and prolong the recovery time after surgery. The use of ultrasound-guided femoral nerve and sciatic nerve block for patients can significantly enhance the anesthesia effect, so it is widely used in anesthesia programs for elderly patients with lower limb fractures. It can be seen that in-depth study and analysis of the anesthesia effect of nerve tissue in elderly patients with lower limb fractures under the guidance of ultrasound has certain practical significance.

1 Materials and methods

1.1 Basic information

The subject selected 50 patients with lower limb fractures who were treated in our hospital from November 2017 to November 2020 for statistical comparison. Two groups were divided into two groups according to the admission serial number. There were 25 cases in the control group, 16 males and 9 females, age range between 54 and 82 years old, the median age is (66.24±1.56) years old, the experimental group has 25 cases, 18 males and 7 females, the age range is

between 51 to 80 years old, and the median age is (66.26±1.51) years old. The data of the two groups of patients showed p>0.05, and the comparability was significant.

1.2 Methods

The control group was given general anesthesia. After entering the operating room, the patients were monitored for their vital signs. Changtonin, midazolam, propofol, fentanyl, and cis-atracurium were slowly injected intravenously In patients, the specific doses are 0.5 mg, 0.05 mg/kg, 1-1.5 mg/kg, 3 μg/kg, 0.15 mg/kg to achieve anesthesia induction[2]. Use the mask to give oxygen, and when the consciousness disappears and the muscle relaxation is satisfied, put a moderately sized laryngeal mask into it, and connect it to the anesthesia machine to control breathing.

The experimental group was treated with general anesthesia + femoral nerve and sciatic nerve block. After general anesthesia, the bone nerve and sciatic nerve block were deployed under ultrasound guidance. Among them, the femoral nerve block required the patient to be in a supine position. After routine disinfection and draping, the puncture point was 2 cm below the line of the pubic tubercle and the anterior superior iliac spine and 2 cm outside the femoral artery pulse. In the case of blood-free withdrawal, 15 ml of ropivacaine hydrochloride with a concentration of 0.375% (National Medicine Standard: H20203032 Approval Date: 2020-02-20 Manufacturer: Shan Dongfang Ming Pharmaceutical Group Co., Ltd. English name: Ropivacaine Hydrochloride Injection) slowly injected it[3]. In sciatic nerve block, the patient's affected side should be in a lateral position. After routine disinfection and draping, the position of the puncture under direct ultrasound vision was observed, and the concentration of 15 ml was set under the condition of no blood. 0.375% ropivacaine hydrochloride was slowly injected into it.

During the surgical treatment, both groups of patients were injected with propofol (National Medicine Standard: H20093542 Approval Date: 2013-12-06 Manufacturer: Hebei Yipin Pharmaceutical Co., Ltd. English Name: Propofol) and Remifentanil (National Medicine Standard) Word: H20143315 Date of Approval: 2014-09-30 Manufacturer: Jiangsu Enhua Pharmaceutical Co., Ltd. English name: Remifentanil Hydrochloride for Injection), the dosage standards were 1-8 mg/(kg·hour), 0.05 μg/(Kg·hour), at the same time intermittent intravenous injection of cis-atracurium 5 mg, to ensure that the bispectral index of EEG is between 40-60[4]. You can stop pumping drugs 5 minutes before the end of the operation, and pull out the laryngeal mask when the patient had a clear consciousness and resumes spontaneous breathing. If the patient's blood pressure drops or increases by more than 20% of the basic value during the operation, rehydration and symptomatic treatment are required[5]. If the patient's heart rate is less than 50 beats per minute, atropine should be used to ensure the safety of their lives.

1.3 Evaluation index

1.3.1 The MAP and HR of the patients in each time period was evaluated.

1.3.2 The anesthesia effects and adverse reactions between the two groups were compared.

1.4 Statistical analysis

The statistical software SPSS19.0 processes the data of the two groups, and $P < 0.05$ means that the data has clinical statistical significance.

2 Results

2.1 Analyse of the MAP and HR in each period of the experimental group and the control group

After induction, MAP and HR were compared in each period between groups, P<0.05 (Table 1).

Table 1. Comparison of MAP and HR in each period of the two groups ($\overline{X} \pm S$)

Group	n	MAP				HR			
		Before induction	Cutting the skin	Intraoperative 1h	Remove the laryngeal mask	Before induction	Cutting the skin	Intraoperative 1h	Remove the laryngeal mask
Test group	25	95.47±12.34	97.13±13.22	96.11±12.09	99.43±13.37	55.47±8.83	56.46±9.32	59.11±9.54	56.64±8.21
Control group	25	95.45±12.31	110.04±12.34	109.98±13.25	110.17±13.76	57.27±9.24	67.05±8.65	69.99±8.04	73.01±7.85

T value	0.0057	3.5694	3.8663	2.7989	0.7042	4.1642	4.3603	7.2057
P value	0.9954	0.0008	0.0003	0.0074	0.4847	0.0001	0.0001	0.0000

2.2 Study on the anesthesia effects of the two groups of patients

Compared with the control group, each index of the experimental group was P＜0.05 (Table 2).

Table 2. Comparison of anesthesia effects between the experimental group and the control group ($\overline{x} \pm s$)

Group	n	Extubation time	Awake time	Orientation recovery time	Propofol dosage	Remifentanil dosage
Test group	25	14.28±3.18	5.57±1.32	11.89±2.23	191.36±22.48	0.23±0.04
Control group	25	18.34±4.07	10.32±2.18	31.67±2.77	337.28±50.98	0.48±0.01
T value		3.9303	9.3192	27.8114	13.0949	30.3170
P value		0.0003	0.0000	0.0000	0.0000	0.0000

2.3 Comparison of adverse reactions between the experimental group and the control group

Index comparison between groups, P<0.05 (Table 3).

Table 3. Analysis of adverse reactions in the two groups (n/%)

Group	n	Increased heart rate	Hypertension	Low blood pressure	Total incidence
Test group	25	0	0	2	8
Control group	25	3	4	1	32
X2					4.5000
P					0.0338

3 Discussion

The elderly are the main group of lower limb fractures. Because of their reduced cardiovascular compensatory function, they are prone to obvious hemodynamic fluctuations during surgery and anesthesia[6]. However, conducting nerve tissue under the guidance of B-ultrasound can significantly enhance the effect of lower limb fracture surgery. Compared with blind detection operation or nerve block guided by nerve stimulator, the advantages of B-ultrasound guidance are very prominent, which are concentrated in the following aspects.

First, the positioning is more precise. Under the condition of direct vision, the direction and position of the puncture needle can be observed to ensure the accuracy of the needle, and the needle can be smoothly inserted to the nerve to be blocked;

Second, the scope of injection can be observed and adjusted to better strengthen the anesthesia effect;

Third, it is safer. Nerve tissue guided by B-ultrasound can effectively avoid damage to blood vessels and nerves[7]. In lower limb fracture surgery, the femoral nerve and sciatic nerve block are guided by B-ultrasound, and the operation site will not be completely blocked. Therefore, it is required to be combined with general anesthesia with a laryngeal mask to enhance the anesthesia effect.

In the study, patients in the experimental group were treated with general anesthesia + femoral nerve and sciatic nerve block. Compared with the control group, P<0.05. This proves that the combination of general anesthesia and femoral nerve and sciatic nerve block can significantly reduce the amount of anesthetic drugs used, shorten the time for patients to wake up, and have more stable hemodynamics.

Due to the intense pain in the fracture area, combined with the stimulation of surgery and anesthesia, patients with lower limb fractures make their body's stress response too strong, which activates the internal and external coagulation systems and presents a hypercoagulable state. According to relevant research results, it is found that the daily activities of fracture patients are reduced, and the vascular endothelium is damaged, and their blood flow rate is also

slowed down. Once in a hypercoagulable state, it is easy to induce thrombosis in the lower limbs. After the thrombus falls off, a series of adverse events will be induced[8]. In clinical practice, the combined use of laryngeal mask general anesthesia and nerve block is far better than simple general anesthesia, and it will not irritate the patient too significantly, and it is not easy to cause severe blood hypercoagulability.

In general, ultrasound-guided femoral nerve and sciatic nerve block can significantly improve the anesthesia effect of elderly patients undergoing lower limb fracture surgery, and can ensure the stability of the patient's hemodynamics during the operation, and reduce the use of drugs as much as possible, which is beneficial to patients Wake up as soon as possible and reduce the incidence of adverse reactions, so it has high clinical promotion and application value.

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Giant Myofibroblastoma of the Breast: A Case Report and Clinicopathological Analysis

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Abstract: Myofibroblastoma of the breast (MFB) is a rare benign mesenchymal tumor of the breast. A case of giant breast myofibroblastic tumor, which is rarely reported in literature, was recently diagnosed in our department. We also analyzed the clinicopathological features of MFB to improve the understanding of the tumor and avoid misdiagnosis.

Key words: Myofibroblastoma of the breast; Clinicopathological Analysis

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1 Clinical data

A 34 years old female patient was admitted to hospital on January 12, 2021 because of "right breast tumor was found for more than 6 months, ulceration and pus for more than 1 month". The patient accidentally touched an "egg size" tumor on his right breast more than 6 months ago, and there was no local trauma history. There was no skin redness, swelling, heat and pain on the surface. A small amount of white milk like discharge could be seen after bilateral nipple extrusion. The amount was small and there was no peculiar smell. In December 2020, the tumor increased significantly, and the right breast was broken and purulent in many places, showing yellow white and no abnormal odor. Later, on January 9, 2021, he went to the county hospital for breast ultrasound examination. The results showed that the right breast was enlarged, with large irregular hypoechoic mass in it, which could not be detected. The probe pressure seemed to have peristalsis, with a little punctate blood flow signal in it. The gland was not clearly displayed, and the nipple was damaged Pressure shift. The nature of the huge tumor in the right breast of the patient is yet to be determined. It is suggested that he should be hospitalized. Today, for further diagnosis and treatment, he came to our hospital.

Physical examination was performed after admission. The right breast is large, the right breast is asymmetric, the right breast skin can see multiple ulceration points, has healed, no pus outflow, right nipple deviation, left nipple deviation, double nipple partial invagination, a small amount of white milk like discharge can be seen after squeezing the bilateral nipples, small amount, no peculiar smell, the middle and upper quadrants of the right breast are obviously uplifted, soft, the left breast does not touch the tumor, and the bilateral axillary lymph nodes do not touch. No enlarged lymph nodes were found on the bilateral clavicles.

In order to clarify the nature of the tumor, the patient underwent right breast tumor resection + nipple areola plastic surgery + random flap formation under general anesthesia on January 20, 2021.The size of the tumor was 31 x 17.5 x 11 cm, and the skin area was 15 x 8 cm. There were

two ulcers on the surface of the skin. The diameters of the ulcers were 1cm and 1.2 cm, respectively. The tumor was complete and the boundary was clear (Figure 1). The solid gray matter on the section was slightly tough. Microscopically, the boundary of the tumor was clear and the edge was pushing (Figure 2). The tumor showed mild spindle cell proliferation, some cells were myofibroblast like, the cytoplasm was eosinophilic, and the nucleus was oval to spindle, which was distributed in the significantly collagenous stroma (Figure 3, 4).The routine pathological diagnosis was as follows(right) breast myofibroblastoma, further molecular detection is recommended. Immunohistochemistry was usedCK (-), CK5 / 6 (-), p63 (-), vimentin (+) (Figure 5), SMA (local +) (Figure 6), ER (-), PR (-), CerbB-2 (-), CD34 (-), Ki67 (1%), bcl-2 (-), desmin (-), CD31 (-), ERG (vascular endothelium +), EMA (-).The patients were further diagnosed by molecular pathologyRB1 / 13q14 deletion.

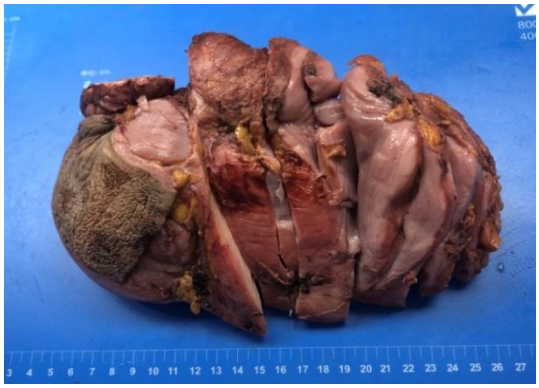

Figure 1. The tumor is well circumscribed

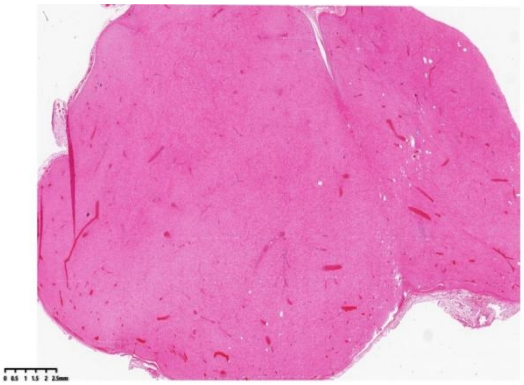

Figure 2. HE 2x tumor is well circumscribed and its margin is pushing

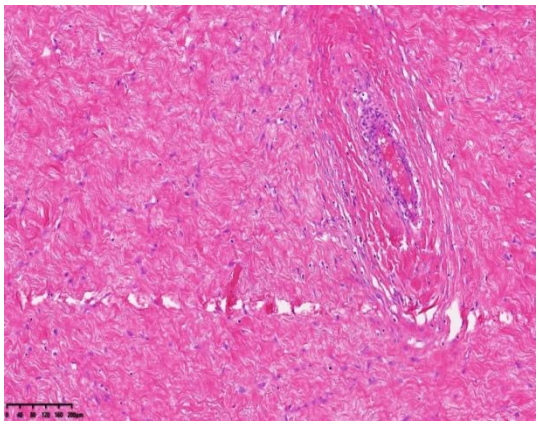

Figure 3. Spindle cell proliferation in collagenated stroma of HE 100x

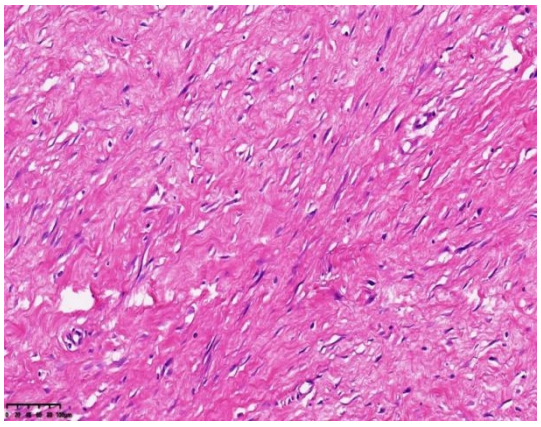

Figure 4. The morphology of HE 200X spindle tumor cells is mild

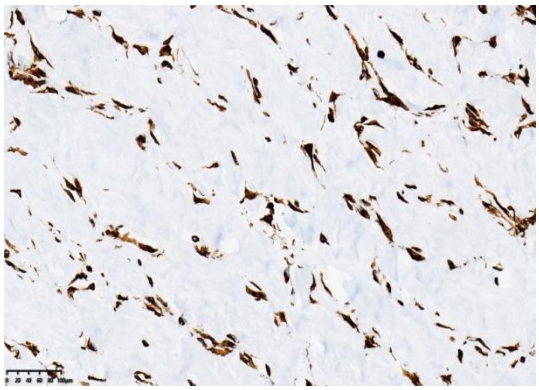

Figure 5. VIM positive IHC 200X

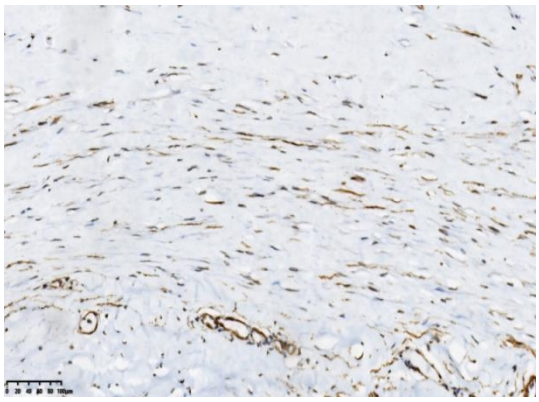

Figure 6. SMA local positive IHC 200X

2 Clinicopathological analysis

Myofibroblastic tumor of the breast (MFB), first named by Wargotz *et al*[1] in 1987, is a benign tumor of mesenchymal origin. It has the characteristics of fibroblasts and smooth muscle cells, which is very rare in clinical diagnosis. The onset age of the disease is wide, which can be seen in adults aged 25-87. There is no gender difference in patients, and it is more common in elderly men or postmenopausal women[2].

Most of the clinical manifestations are solid, painless and movable hard nodules of unilateral breast, which grow slowly. The course of disease varies from several months to several years. It may also grow rapidly in a short period of time. It is rare for bilateral or unilateral multiple lesions. Ultrasound examination often showed irregular hypoechoic nodules, unclear boundary, uneven internal echo, CDFI visible blood flow signal[3].

The tumor size ranged from several millimeters to 11 centimeters (average 2 cm, most < 4 cm). Most of the tumors were well circumscribed, non encapsulated masses with smooth edges or lobulated, hard and tough texture[4]. Microscopically, the classic type of breast myofibroblastic tumor was characterized by the edge of the tumor was pushed, no true capsule, the tumor was composed of spindle cells, light stained or eosinophilic cytoplasm, mild nucleus, oval to spindle shape, arranged in short bundles, mixed with characteristic scar like collagen fiber bundles, fat, smooth muscle, cartilage or bone tissue components can be seen in the tumor, and mucoid degeneration can be seen in the stroma Mitotic figures were very rare[5]. There were six variants of myofibroblastoma. (1) Lipomatous typeIt was composed of mature fat components (accounting for more than 50% of the whole tumor), in which nodular or irregular fibrous areas were scattered, and the typical features of myofibroblastic tumor can be recognized locally in the fibrous area[6]. (2) Mucoid type. The tumor was completely or mainly composed of myxoid stroma, with spindle and stellate cells distributed in myxoid stroma[7]. (3) Fibrosis/collagen type. Spindle cells were few and distributed in the diffuse fibrosclerotic stroma, with irregular fissure like spaces of pseudoangiomatous stroma hyperplasia[4]. (4) Epithelioid type. Tumors mainly composed of medium-sized cells with epithelioid morphology (> 50%), The nuclei of the tumor were round, oval, mononuclear or binuclear, and the cytoplasm was deeply eosinophilic. The tumor cells were arranged in various growth patterns, including nest, solid sheet, micronodule, acinar or trabecular. The tumor cells can be arranged in a single cell or a single row of cord structure, which was very similar to invasive lobular carcinoma, and the stroma was fibrotic or mucoid[8]. (5) Decidual type. Tumor cells were similar to decidua like morphology, with abundant cytoplasm, eosinophilic, large nucleus, vacuole like and obvious nucleolus[9]. (6) Palisade / neurilemmoma like. It was composed of single spindle cells with palisade like nuclei, forming many Verocay like bodies[10].

Immunohistochemical staining showed that tumor cells expressed vimentin, desmin (positive rate 89%) and CD34 (positive rate 91%)[11]. Some cases expressed Er, PR and AR, and myogenic markers such as SMA and h-caldesmon were expressed in varying degrees. There was no expression of CK, EMA, HMB-45, CD117 and S-100[12]. Cytogenetic studies have shown that breast myofibroblastic tumor is a tumor with deletion of chromosome 13. Recent FISH studies have shown that it is characterized by single or double allele deletion of RB1 / 13q14 and / or single allele deletion of fox1 / 13q14 [4]. A few cases showed chromosome 16 deletion.

In this case, the boundary of the tumor was clear. The fibroid spindle cell proliferation, eosinophilic cytoplasm and oval to spindle nucleus were seen in the stroma with significant collagenation, which was consistent with the microscopic pathological features of myofibroblastic tumor (fibrotic / collagenated type). Immunohistochemical results showed vimentin positive, SMA local positive, consistent with the immunohistochemical expression of myofibroblastoma, desmin and CD34 negative, consistent with a few negative cases of breast myofibroblastoma in the literature, Ki67 proliferation index was 1%, tumor cells CK, CK5 / 6, S-100, er, PR were negative, spindle cell metaplasia carcinoma and neuro adipose derived tumors can be excluded. The results of tumor molecular detection showed that: 1RB1 / 13q14 deletion supports the cytogenetic characteristics of breast myofibroblastoma. This case was diagnosed as myofibroblastic tumor (fibrotic / collagenous type) according to the history, histological morphology, immunohistochemical results and molecular detection results. The largest diameter of the tumor is 31 cm. It is a giant myofibroblastic tumor of the breast, which is rarely reported in the literature at home and abroad.

Local complete resection of breast myofibroblasts can

be cured, and the recurrence and metastasis rates are low[13]. It is easy to be misdiagnosed in the intraoperative pathological diagnosis, so it needs to be differentiated from spindle cell proliferative lesions. (1) Pseudoangiomatous stromal hyperplasia (PASH): Under the bundle type microscope, myofibroblasts gathered in bundles and pseudovascular spaces disappeared, similar to myofibroblastoma, but different from breast myofibroblastoma, the proliferation of PASH included perilobular and intralobular stroma, including mammary duct / lobule[14]. (2) Reactive spindle cell nodules. It is the proliferation of myofibroblasts produced by tissue injury, previous history of biopsy or fine needle aspiration, phagocytosis of hemosiderin cells, lymphocytes, plasma cells, fat necrosis and other reactive changes, which support the morphological characteristics of the lesion. (3) Solitary fibrous tumor (SFT) overlaps with breast myofibroblastic tumor in morphology and immunohistochemistry, and can express CD34. However, the characteristic nuclear expression of SFT is STAT6 , which is usually desmin negative, and Rb is absent[11]. (4) Others: Desmoid fibromatosis, lobular tumor, invasive lobular carcinoma, spindle cell metaplasia carcinoma, *etc*. Therefore, it is necessary for pathologists to improve the accuracy of pathological diagnosis on the basis of accumulated diagnosis experience, combined with immunohistochemistry and molecular pathology, so as to avoid misdiagnosis.

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Clinical Effect Observation of Jieyu Decoction in the Treatment of Generalized Anxiety Disorder

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[Abstract] ***Objective:*** To observe the clinical effect of Jieyu decoction in treating generalized anxiety disorder with stagnation-heat in liver meridian type. ***Methods:*** There were 72 cases of generalized anxiety disorders outpatient and inpatient patients, and 36 in the control and treatment group. The control group was given oral Deanxit; the treatment group was given Jieyu decoction granules, and necessary psychological counseling was given to patients in both groups. Changes in traditional Chinese medicine syndrome scoring scale, Hamilton scale (HAMA), dynamic electrocardiogram heart rate variability and other indicators were recorded and compared between the two groups. ***Results:*** The total effective rate of the control group was 76.5%, and the total effective rate of the treatment group was 80.0%. The curative effect of the treatment group and the control group was significantly higher than that before treatment ($P < 0.05$), and there was no significant difference in the overall curative effect between the two groups ($P > 0.05$). The HAMA scale score of the two groups was significantly lower than that before treatment ($P < 0.05$), and there was no significant difference in the reduction rate of HAMA score between the two groups ($P > 0.05$). The traditional Chinese medicine syndrome scores of the two groups were significantly decreased compared with that before treatment ($P < 0.05$). The traditional Chinese medicine syndrome scores of the treatment group were significantly different from that of the control group after 8 weeks of treatment ($P < 0.05$). Two groups of heart rate variability in 24 h period of standard deviation between the average normal R - R (SDNN), 24 h per 5 min normal R - R period between the standard deviation (SDANN), root mean square of phase difference between adjacent R - R (RMSSD) and the number of cardiac 50 ms accounted for the percentage of the total number of cardiac (PNN50) than before treatment significantly increased ($P < 0.05$), 8 weeks after treatment the SDNN, SDANN than the control group no significant difference ($P > 0.05$), RMSSD,PNN50 significantly difference compared with control group ($P < 0.05$). ***Conclusion:*** Jieyu decoction has good efficacy and high safety in the treatment of generalized anxiety disorder of the type of liver meridian and heat stagnation, which is suitable for clinical promotion and application.

Key words: Generalized anxiety disorder; Stagnation-heat in liver meridian type; Jieyu decoction; Deanxit; Clinical research

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Generalized anxiety disorder is an independent disease characterized by persistent worry, anxiety and tension[1]. Its mental anxiety, physical anxiety, motor anxiety and sleep disorders and other symptoms affect the work and life of patients in many ways, serious cases can lead to damage to the social function of patients[2]. The study shows that the 12-month prevalence rate of GAD in China is 0.8%, and the lifetime prevalence rate is 1.2%[2]. During the epidemic, the incidence of adult public anxiety in Panzhihua City, Sichuan Province was as high as 39.4%[3]. Therefore, we urgently

need effective intervention through drugs and psychotherapy to help patients improve their quality of life in many aspects, such as social psychology, life satisfaction, work efficiency and so on.

At present, the pathogenesis of GAD is not clear, including endocrine, neurotransmitter, immune injury and other aspects[4]. Among them, drugs targeting neurotransmitter receptors such as 5-hydroxytryptamine (5-HT) and norepinephrine (NE) are used as the main treatment methods in clinic. These drugs have many adverse reactions and obvious withdrawal reactions at the same time[5]. Although there are cognitive behavioral therapy(CBT), Morita therapy and other psychotherapy as auxiliary, but poor compliance, long duration, high economic cost and other problems still make the overall therapeutic effect of GAD is not good[6]. A lot of data show that traditional Chinese medicine treatment of GAD is more targeted, and the compatibility of rational prescriptions and medicines is flexible, which greatly avoids the serious adverse reactions of chemical drugs. The mechanism of traditional Chinese medicine in the treatment of GAD has been constantly discovered in the research and exploration of many scholars, which provides more data support for its clinical treatment, and its clinical application is getting wider and wider[7].

1 Data and methods

1.1 General data

Included in 72 outpatients and inpatients who met the diagnostic criteria of traditional Chinese and western medicine of GAD from January 2020 to January 2021, and were randomly divided into control group and treatment group. The hospital's ethics committee fully understood and approved the study.

1.2 Diagnostic criteria

Western medicine diagnostic criteria refer to "Chinese Classification and Diagnostic criteria of Mental Disorders" 3rd edition (CCMD-3) GAD diagnostic criteria; TCM diagnostic criteria refer to "anxiety disorders, guidelines for diagnosis and treatment of common diseases in traditional Chinese medicine" (formulated by the Chinese Society of traditional Chinese Medicine in 2008)[8, 9].

1.3 Patients

Patients with (HAMA)score > 14, but < 29 were included, and those with anxiety attacks and severe psychotic symptoms secondary to other mental or somatic diseases were excluded,and those with poor compliance or taking other antipsychotic drugs during the study period were excluded[10] .

2 Methods

2.1 Therapeutic methods

Control group: Deanxit (haloperidoxine tablets, Hainan Huineng Pharmaceutical Co., Ltd., H20143390, specification: each tablet contains 0.5 mg haloperixine + 10 mg melitracine), 1 tablet each time, 1 tablet in the morning and 1 tablet in the noon. Treatment group: Jieyu decoction granule (composed of 15 g of albizzia bark, 10 g of Radix Ophiopogonis, 12 g of Radix Paeoniae Alba, 10 g of turmeric, 10 g of bergamot, 6 g of Rhizoma nardostachyos, 15 g of Rubia officinalis, 20 g of tuber fleeceflower stem), 1 dose a day, washed with warm water, and taken in the morning and evening. The course of treatment was 8 weeks. During the study, patients in both groups were not treated with other antipsychotic drugs, and were given necessary psychological counseling at the same time.

2.2 Clinical efficacy

The clinical efficacy was judged by the reduction rate of (T) of HAMA scale before and after treatment as the main index of curative effect. Recovery: HAMA score reduction rate > 75%; obvious effective: 50% ≤ HAMA score reduction rate ≤ 75%; effective: 25% ≤ HAMA score reduction rate < 50%: invalid: HAMA score reduction rate < 25%. Total effective rate (%) = (number of cured cases + number of markedly effective cases + number of effective cases-shedding) / total number of cases × 100%.

2.3 Statistical analysis methods

The data are processed by SPSS 22.0 statistical software, and the measurement data are expressed by $\bar{x}\pm s$. The measurement data were first tested for normality, and the rank sum test was used for non-normal distribution; paired sample t-test was used for comparison within the measurement data group consistent with normal distribution, and independent sample t-test was used for inter-group comparison. Rank sum test and nonparametric test were used for grade data, and chi-square test was used for counting data. The two-sided test was used in the hypothesis test, and the difference was statistically significant ($P < 0.05$).

3 Results

3.1 Comparison of general information

See Table 1. In the course of the study, 3 cases of moving, work and loss of follow-up were included in the control group (n = 34) and the treatment group (n = 35). There was no significant difference in the general data between the two groups (P > 0.05).

Table 1. General data of two groups of patients

	Case	Age（age, $\bar{x}\pm s$）	Gender (example)		Years of education （year, $\bar{x}\pm s$）	Course of disease (month, $\bar{x}\pm s$)
			Male	Female		
The control group	34	45.65±7.30	13	21	10.97±2.52	8.12±1.23
Treatment group	35	46.63±6.73	15	20	11.05±2.38	8.23±1.33
Statistical measure		t=-0.581	X^2=0.153		t=-0.147	t=-0.360
P value		0.563	0.442		0.884	0.720

Note: Compared with the control group, P＞0.05.

3.2 The comparison of HAMA scale scores between the two groups before and after treatment is shown in Table 2.

Table 2. Comparison of HAMA scores between the two groups before and after treatment ($\bar{x}\pm s$)

Group	Before treatment	After treatment	
		4 weeks	8 weeks
The control group（n=34）	22.06±4.11	15.82±3.97*	10.26±1.83*
Treatment group（n=35）	21.71±4.05△	14.97±3.67*△	9.80±2.00*△

Note: Compared with this group before treatment, *P<0.05;compared with the control group, △P＞0.05.

3.3 The comparison of the scores of TCM syndrome scale is shown in Table 3.

Table 3. Scores of TCM syndrome scale before and after treatment in two groups ($\bar{x}\pm s$)

Group	Before treatment	After treatment	
		4 weeks	8 weeks
The control group（n=34）	12.74±2.63	7.74±2.63*	5.73±2.63*
Treatment group（n=35）	13.49±3.02△	6.60±3.08*△	3.66±2.44*△△

Note: compared with this group before treatment, * P < 0.05; compared with the control group at the same time, △P > 0.05; compared with the control group at the same time, △△P < 0.05.

3.4 The observation of curative effects before and after treatment is shown in Table 4.

Table 4. Comparison of therapeutic effects between the two groups [cases (%)]

Group	Recovery	Obvious effective	Effective	Invalid	Total effective Rate (%)	Z value	P value
The control group（n=34）	3（8.8%）	15（44.1%）	8（23.5%）	8（23.5%）	76.5%	-0.333	0.739
Treatment group（n=35）	3（8.6%）	17（48.6%）	8（22.9%）	7（20.0%）	80.0%		

Note: By rank sum test, P＞0.05

3.5 Comparison of TESS scale scores and safety between the two groups

As shown in table 5.As evaluated by TESS scale, the minor adverse reactions in both groups were alleviated after proper treatment.

Table 5. TESS scale scores of the two groups after treatment($\bar{x}$±s)

Group	Adverse reaction score (score, $\bar{x}$±s)	Statistical measure	P value
The control group（n=34）	0.65±0.92	Z=-2.618	0.009
Treatment group（n=35）	0.23±0.69		

Note: By rank sum test, P＞0 0.05

3.6 The comparison of heart rate variability between the two groups after treatment is shown in Table 6.

Table 6. Analysis and comparison of heart rate variability between the two groups after treatment ($\bar{x}$±s)

Group	Time	SDNN（ms）	SDANN（ms）	RMSSD（ms）	PNN50（%）
The control	Before treatment	92.76±12.34	94.79±12.36	30.26±3.78	9.68±2.73
group	After 4 weeks of treatment	123±10.27*	120.03±10.45*	40.00±4.16*	13.35±2.87*
（n=34）	After 8 weeks of treatment	127.97±10.92*	129.29±10.68*	48.00±4.16*	18.59±2.80*
Treatment	Before the treatment	89.46±15.48	90.23±15.35	32.43±3.45	8.97±2.70
group	After 4 weeks of treatment	125.37±9.83*△	123.20±9.52*△	41.12±3.24*△	14.00±2.97*△
（n=35）	After 8 weeks of treatment	129.54±10.01*△	131.09±9.36*△	53.37±2.97*△△	20.26±2.95*△△

Note: Compared with this group before treatment, *P < 0.05;Compared with the control group, △P > 0.05;Compared with the control group, △△P < 0.05

4 Discussion

GAD's main symptoms are fear of unknown goals or excessive worry about specific goals, as Danxi Heart method said, "personal diseases are often born in depression", so it is classified as "depression syndrome". The internal injury of emotion is the main cause of GAD, and the deficiency of body and the deficiency of visceral qi are the internal factors, as stated in "the origin of miscellaneous diseases, rhinoceros candle and depression". The mixed syndrome of deficiency and excess is often seen in the course of GAD over a long period of time, and the location of the disease is mainly in the liver. The liver is the master of catharsis, it is most comfortable to be in a state of patency, and the depression of liver qi will damage the viscera. As the words of doctors in Liuzhou said, "the disease of seven emotions must start from the liver." Chief physician Ren Xiaofang summarized through clinical diagnosis and treatment that the pathogenesis of GAD is mainly qi-fire depression, fire depression and forcing yin, and the treatment should be soothing the liver and relieving depression, nourishing yin and softening the liver.

Jieyu decoction is a self-made prescription by Professor Yang Zhen. The original prescription was used to treat the "stagnant heat phase fire" stage of hepatitis B. Chief physician Ren Xiaofang, based on the principle of treating different diseases with the same treatment, used it to treat GAD liver Meridian stagnation-heat syndrome. The prescription consists of albizzia bark, Ophiopogon japonicus, Radix Paeoniae Alba, turmeric, bergamot, rhizoma nardostachyos, rubia officinalis, tuber fleeceflower stem.

Albizzia bark, tuber fleeceflower stem for the king medicine, albizzia skin into the heart, liver and lung meridian, have the effect of relieving depression and calming the mind; tuber fleeceflower stem into the heart and liver meridian, nourish the heart and calm the mind, ventilation and blood flow. Turmeric and Radix Paeoniae Alba are courtier medicine, qi depression for a long time, blood stasis, turmeric can help albizzia bark soothing the liver and relieving depression, and has the function of regulating qi, cooling blood and removing blood stasis; Radix Paeoniae Alba nourishes blood and camp, collects yin and calms the liver, nourishes the liver and relieves palpitation. Bergamot, rhizoma nardostachyos, Rubia officinalis and Ophiopogon japonicus are all adjuvants to see the disease of the liver. Bergamot enters the liver, spleen and lung meridian, which can soothe the liver and regulate the spleen, rhizoma nardostachyos enters the spleen and stomach meridian, and can regulate qi and awaken the spleen, which can help soothe the liver and regulate qi, awaken the spleen and stomach; rubia officinalis clear away heat and cool blood, and cool blood without leaving blood

stasis; Rubia officinalis enters the heart, lung and stomach meridian, which has the effect of nourishing yin, giving birth to fluid, clearing the heart and removing annoyance.

All kinds of medicines are in harmony, playing the effect of soothing the liver and relieving depression, nourishing yin and softening the liver, truly regulating qi without breaking qi, cooling blood without leaving blood stasis, clearing heat without damaging the stomach, tonifying without weariness. Physiological characteristics of using Yang based on liver body Yin, soothing the liver and clearing heat, regulating the liver and nourishing the liver, the liver qi reaches, the visceral qi is filled gradually, and the disease recovers itself.

To sum up, Jieyu decoction in the treatment of GAD with stagnation of liver meridian has the same efficacy as the chemical drug Deanxit, which can significantly improve the symptoms of patients, have a positive impact on some indexes of heart rate variability, and has high safety, so it is worth popularizing and applying in clinic.

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Analysis on the Law of Chinese Medicine Use of Ulcerative Colitis and TCM Syndrome Differentiation and Treatment

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Funding: Based on Th17/Treg immune network, the mechanism of action and clinical efficacy evaluation of Fuyang Huoxue Jiedu Decoction against recurrence of ulcerative colitis were studied

Abstract: Ulcerative colitis is a kind of inflammatory bowel disease. The disease is slow and easy to relapse. Western medicine treatment mainly focuses on symptomatic treatment, which has certain side effects on liver and kidney function. Ulcerative colitis has unique advantages in disease, so by studying a large amount of information, mainly from the law of traditional Chinese medicine use of UC, and a brief summary of the treatment of TCM syndromes, this article provides ideas and basis for clinical diagnosis and treatment of the disease.

Key words: Ulcerative colitis; Law of traditional Chinese medicine; Syndrome differentiation and treatment

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Youlcerative colitis (UC) is a common recurrent disease of the digestive system, which is characterized by inflammation and rectal mucosa, mainly abdominals, abdominals, and abdominal pain.This disease can be seen at any age.In recent decades, the incident of this disease in China has risen sharply[1].

The ecology and pathologies of Western medicine are still unclear, but modern medicine believes that genetic susceptible, environmental factors and immune factors are important factors in the West of UC. Some scholars also pointed out that the imbalance of the intestinal flora and it's metabolism can trigger a series of inflammatory reactions, which will lead to immune disorders and induce disorders.

1 Understanding of traditional Chinese medicine

"I must read medical":"The syndrome of dysentery has multiple splen and kidneys.Patients with spelt ill, those with kidneys are deeply ill, and those with no chronic dysentery without kidney damage."Kidney-related, congenital inefficient, acquired daytrophy, six evils, abnormal daily life, etc.Cause the intestinal dysfunctional damage, the ability to decompose, the poor circulation of the qi and blood, and damage to lipid membranes and blood network.

2 Analysis of the law of the use of traditional Chinese medicine

2.1 Single medicine

An analysis of the law of traditional Chinese medicine for UC based on data mining concluded that the most commonly used single Chinese medicines for the clinical treatment of UC are licorice, Atractylodes, Coptis, Codonopsis, etc., mainly tonic drugs, heat-clearing drugs, and Qi regulating drugs. The first two have the highest frequency of medication. Ingredients are calm in nature, sweet in taste, effective in benefiting qi, expelling phlegm, relieving pain, and recognizing various medicines. It can effectively relieve cough, dyspnea, cramps and pain. Atractylodes macrocephala tastes bitter, sweet, warm in nature, functions to invigorate the skin and qi, dry dampness,

diuresis, antiperspirant, and antipers. Studies have shown that the extract of Atractylodes macrocephala has liver protection, znti-inflammato ,anti-thranalytic effects.

2.2 Association rules, drug properties, meridians, and efficacy

According to the analysis of UC medication rules, the most frequently occurring oral related drugs are Atracted macrocephala-Poria, Atractylodes macrocephala-Licorice, Atractylodes macrocephala-Citrus tangerine peel. The most commonly used clinically related drugs are qi and spelt-invigorating drugs. Cyprusis and dampness drugs, Qi regulation drugs, of which the qi tonics and spedes insuring drugs are dominant. It can be found that the key to the treatment of UC lies in the treatment of the splash, and the spoken tonic is the treatment method. From the analysis of nature and taste of traditional Chinese medicine, the warm, cold, and bitter taste are the main ones.In the meridian, the spleen and stomach meridians and the liver meridian are the highest, followed by the lung meridian; in terms of efficacy, the most frequently appearing are the tonic drugs, heat-clearing drugs, and medicine.

3 TCM syndrome have differentiation and treatment

Traditional medicine has unique advantages in the treatment of this disease. Combining syndrome differentiation and treatment, using Chinese medicine, acupuncture, enema and other therapies, the prescription is flexible and flexible, with the addition and subtraction of the syndrome, the effect is wide, the adverse reaction is small, and the clinical symptoms are effectively relieved.

3.1 Inner proof of dampness and heat

This syndrome often manifests as tenesmus with diarrhea, red and white pus and blood in the stool, short red urine and other symptoms. Peony Decoction has the effects of regulating qi and blood, clearing heat and removing dampness. Scutellaria baicalensis and coptidis are selected as the king of drug in the prescription to relieve the damp heat in the intestine. Re-use of peony, restrains yin and nourishes blood, relieves emergency pain, angelica nourishes blood and nourishes blood, the combination of the two medicines has the effect of invigorating blood and regulating blood, effectively alleviating the damage of yin and blood caused by damp-heat burning and intestinal collateral damage. Modern pharmacological studies have shown that it can act on multiple cellular components to produce different biological functions, and has the characteristics of "multi-component-multi-target-multi-pathway". Xu Min[2] found that Shaoyao Decoction regulates the excessive activation of the TLR4/NF-κB pathway, which in turn affects the expression of IL-6 and other immune networks, and plays a key role in the development of UC.

3.2 Deficiency of spleen and stomach qi

Chronic disease is due to spleen deficiency and stomach weakness, loss of transport and transformation, accumulation of water and dampness, and retention of intestinal collaterals, so the disease develops. UC is a syndrome of spleen-stomach-qi deficiency and is mostly manifested by symptoms of low digestive function such as fullness of the abdomen, loose stools and so on. Shenling Baizhu Powder is composed of ginseng, atractylodes macrocephala, poria, yam, etc. The first three are the monarch medicines matched with medicines such as antidiarrheal, stomach, and lungs and qi, that play the effects of invigorating qi, strengthening the spleen, exuding dampness and stopping diarrhea. Modern pharmacological studies have shown that this formula has antidiarrheal and analgesic effects, can regulate immune disorders, and promote the repair of damaged intestinal mucosa. Li Zihui[3] proved through animal experiments that Shenlingbaizhu Powder regulates the expression of NF-κB and other upstream kinases in the rat colon and inhibits the release of downstream related inflammatory factors, thereby reducing intestinal inflammation and alleviating intestinal mucosal damage.

3.3 Liver depression and spleen deficiency syndrome

The main symptoms of UC with liver depression and spleen deficiency include bowel sounds and abdominal pain, diarrhea, tightness in the chest and hypothermia, and narrow pulse. The main prescription for pain and diarrhea contains four herbs of Atractylodes macrocephala, peony root, dried tangerine peel and wind-proof. The monarch drug Atractylodes macrocephala can invigorate the spleen and dry dampness to cure spleen deficiency; the minister drug white peony can relieve pain and relieve pain, restrain the yin and nourish blood; adjuvant it is used to regulate qi and dry dampness. Tangerine peel and Xin San are the anti-wind for soothing the liver, combined with surgery and peony, and strengthen the power of dampness to help stop diarrhea. The four medicines are shared to invigorate the spleen and

overcome dampness and relieve diarrhea, sooth the liver and regulate qi and relieve pain. A large number of studies have confirmed that Tongxie Yaofang can effectively relieve the symptoms of diarrhea and abdominal pain, and its mechanism may be to inhibit excessive immune response and prevent further damage to the intestinal mucosa.

3.4 Spleen and kidney yang deficiency syndrome

The main manifestations of this syndrome are pain in the umbilical abdomen before dawn, the grains are not melted, the waist and knees are sore, and the pulse is sinking. The spleen and kidney are the foundation of the heavens, the spleen governs the promotion of clearness, transport and transformation, and the kidney governs the warmth of the five internal organs. The two influence each other and are mutually cause and effect. If the spleen and kidney are insufficiency, the body's temperature is dereliction of duty, loss of transport and transformation, and water retention. Therefore, it is diarrhea. Fuzi Lizhong decoction, the prescription of Fuzi Daxin and Dare, can warm the kidney yang, so the UC of spleen and kidney yang deficiency is commonly used in this prescription. Sishen Pill is another classic prescription for the treatment of this syndrome. The prescription contains psoralen, evodia, schisandra, and nutmeg, which can exert curative effects by interfering with multiple systems such as circulation, digestion, and immunity.

4 Summary

In the past few decades, the incidence of UC has generally increased, which has seriously affected people's quality of life. My country has abundant resources of traditional Chinese medicine. Chinese medicine not only has antiviral effects, but the problem of resistance of traditional Chinese medicine is not obvious. Therefore, it is necessary to strengthen the characteristics of traditional Chinese medicine therapy and traditional Chinese medicine pharmacology research, and screen special Chinese medicines and special prescriptions to promote the development of UC. The standardization of TCM diagnosis and treatment was then promoted to the international community. In the process of clinical diagnosis and treatment, we should also fully grasp the law of disease incidence, build a more comprehensive diagnosis and treatment framework, and strive to overcome this medical problem as soon as possible.

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Discussion on the Correlation Between Yang Deficiency & Cold-dampness and Malignant Tumors Based on "Diseases producing the liquid that is clear and chill all result from coldness"

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Abstract: Tumor is defined as a kind of chronic diseases by the World Health Organization. The integrative traditional Chinese and western medicine works well on the treatment of tumors, even in advanced patients or patients with recurring and metastatic tumor. However, the pathogenic mechanism of tumors is still unclear. Therefore, based on the 19th pathogenesis in *Yellow Emperor's Internal Class* that "Diseases producing the liquid that is clear and chill all result from coldness", the paper explores the etiology pathogenesis of malignant tumors, and the correlation between which and tumor recurrence and metastasis, and also discusses the rules for the treatment of tumors at various stages with great method of warming yang for dispelling cold.

Key words: Malignant tumor; Yang deficiency and cold-dampness; Warming yang for dispelling cold

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During the treatment process of malignant tumors, Chinese medicine plays important effects on relieving the pain from cancer, reducing side-effects of radiotherapy and chemotherapy, preventing tumor recurrence and metastasis and improving patients' life quality, but all of those are adjuvant therapies for patients underwent Western medicine treatments, and belong to symptomatic treatments as they can only suppress the symptoms. Tumors should be discussed and treated from the pathogenesis for achieving the goal of "cure". Based on "Diseases producing the liquid that is clear and chill all result from coldness", this paper tried to refine that the yang deficiency and cold-dampness is a key pathogenesis for tumors to occur and grow, and has explored yang deficiency and cold-dampness's impacts on tumor recurrence and metastasis, and proposed syndrome differentiation and treatment on tumors at different stages.

1 Diseases producing the liquid that is clear and chill & "cold-dampness"

Su Wen • Zhi Zhen Lun said: "Diseases producing the liquid that is clear and chill all result from coldness". The "liquid" in the original text refers to all body secreta in liquid state in general. "Clear and chill" means clear and transparent, faint and cold. It pointed out that the cause for "clear and cold liquid" is coldness, indicating that many diseases with water metabolism disorders result from cold evil. The cold evil damages yang, and yang qi becomes insufficient, and then the blood qi and body liquid turn soft and weak, damp and muddy body liquid accumulate, resulting in water metabolism disorder, which is the cause for cold-dampness to occur. Cold evil is prone to interact with damp evil, causing symptom of cold-dampness.

2 If yang is insufficient, cold-dampness develops.

Zhang Jingyue put forward "Yang is generally insufficient", it was said in J*ingyue Pandect* that "If yang is strong, life is long. If yang is weak, life is short, so yang is never excess". Zhang Jingyue thought that yang was hard to get but easy to loose, and was in short in most cases. Chen Rixin[1] also believed that majority of modern people usually have insufficient yang and qi as the lifestyle changes. Modern medical studies have shown that the immunity of patients with yang deficiency is weaker and more susceptible to cold evil than before. *Nei Jing* said: "If yang is deficiency, cold develops". If spleen and kidney has yang deficiency, endogenous cold-dampness develops. From the perspective of Chinese medicine theory, the formation of cold-dampness and evil wind is mainly related to the body yang deficiency as well as yin-cold excess. The deficiency and damage of yang results in yang's warming to qi and blood as well as body liquid being being weakened. The qi and blood run slowly, even stagnate, that causes cold-dampness. Cold-dampness can damage yang that block running of qi and blood in reverse, which lead to further function disorder of internal organs, and can worsen the stasis of blood, phlegm-damp, retention of food and other tangible things, more seriously, it may produce abdominal mass, and make the disease linger.

3 Yang deficiency and cold-dampness is the key pathogenesis for tumor occurrence and growth.

People get used to explain the causes of tumors with"heat toxin" and "cancer toxin", and believe that tumors are made of pathological products such as heat toxin, stagnation of qi, turbid phlegm, and blood stasis, which ignores a part of traditional Chinese medicine theory that tumors are born from cold. For example, *Lingshu*·• *Origins of Hundred Diseases Chapter*" pointed out that "Stasis starts with coldness." *Difficulty* • *Fifty-five Difficulties* also said that what makes stasis is yin qi. All of these books pointed out that tumors generally come with yin syndrome, and its occurrence and growth are closely related to the evil of yin and cold. *Suwen* • *The Great Theory of Yin and Yang Phenomena* said: "Yang can promote things transferring to qi, and yin can promote things forming." The qi transferred by yang is insufficient, and the excess things form from yin. The weak yang qi and excess yin qi in the body causes invasion of cold-dampness, stagnation of qi activity, abnormal transportation of body liquid and stasis of pathological products, such as muddy phlegm, blood stasis and drinking water, and may lead to tumor after a long time[2]. All the books pointed out that the root cause of tumor is insufficiency of yang qi and excessive cold-dampness.

4 Yang deficiency and cold-dampness promotes tumor recurrence and metastasis.

Tumor recurrence and metastasis is the root reason why tumor is difficult to be cured. Clinical studies have shown that the recurrence and metastasis of tumor is not only related to the surgery of the tumor's primary lesion, but also related to the human body's weak yang, decreased immune function as well as uncontrollable cancer cells[3]. The hidden evil pathogenesis is a major innovation of the school of febrile disease with the central idea that weakened body resistance and existing evil. This pathogenesis is almost the same as tumor recurrence and metastasis. The cause of tumor recurrence and metastasis is tumor cells lurking in the body, as "hidden evils" lives deep in the body[4]. As the body is weakened, the normal function of the immune system is affected, while circulating tumor cells and tumor dormant cells take the opportunity to spread outwards, resulting in tumor recurrence and metastasis[5]. As the disease develops, the qi of cold-dampness and evil stays in the viscera and continuously depletes the patient's yang qi. The patient's righteousness is further depleted. Wherever the yang is deficient or damaged, the tumor may metastasize there, that is the so called "wherever there is deficiency is the area invaded by the evil"[6]. On the other hand, as removing tumor lesions by surgery damages the patient's yang qi, lowers the patient's immunity, makes yang qi weak and cold, cold phlegm coagulates and blood flow blocks. Yin and evil, like blood stasis and cold phlegm and dampness stasis, interact with each other, over a long period of time, causes trouble, making yang qi more depleted, and forming a vicious circle. Eventually, the cold-dampness overcomes the evil qi, leading to prevailing of evil and weakened body resistance, and hidden evils out causing illness.

5 Differentiation and treatment of malignant tumors at different stages

Some physicians do not differentiate between deficiency and

excess of cold and heat during the treatment process of tumor diseases, and do not study the etiology and pathogenesis of the disease. They one-sidedly thought that tumors are "heat toxins", and misused bitter cold, and heat-clearing and detoxifying drugs in large doses. Regarding the treatment of tumors from cold-dampness, Professor Tong Xiaolin[7] pointed out that "Cold-dampness is like moss in a pool, of which moss grows luxuriantly on the the damp, dark, cold, and sunless area. The typical cold-damp tongue is white and as thick as powder. When it is given enough sunlight for treatment, the moss will be removed by itself." To eliminate cold-dampness, the great method of warming the yang for dispelling the cold shall be used, and the commonly used drugs are: aconite, dried ginger, cinnamon, psoralen and other drugs. Studies have shown that warming yang for dispelling cold medicine can directly inhibit or kill tumor cells, induce tumor cell differentiation and apoptosis, and enhance immunity[8]. The course of malignant tumors can be divided into three stages ① Early stage: The main symptom of tumor shows up, and should be treated with attacking the evil; ② Medium stage: Yang deficiency is gradually obvious in patients with tumors at this stage as well as mixture of deficiency and excess, and they should be treated with attacking and supplementing; ③ Late stage: Tumor patients at this stage mostly have a great loss of vital energy, and the majority of patients are with deficiency syndrome. These patients should undergo treatment of warming yang and strengthening the body. Tumor patients at different stages should be treated with different priorities between strengthening the body and removing evils according to the level of deficiency and excess.

6 Summary

By discussing on the 19th pathogenesis in *Su Wen • Zhi Zhen Yao Da Lun* that ″Diseases producing the liquid that is clear and chill all result from coldness", the author concluded that yang deficiency and cold-dampness is the key pathogenesis of tumor occurrence and growth, explained how yang deficiency and cold-dampness promotes tumor recurrence and metastasis, and proposed to take warming yang for dispelling cold as the treatment method to treat tumor patients by stage and syndrome differentiation. Although the method of warming yang for dispelling cold has been effective in anti-tumor, there is no large-scale systematic randomized controlled studies, and no clinically effective anti-tumor warming drugs have been introduced. Therefore, we still need to continue exploring the application of warming yang for dispelling cold and how to prevent tumor recurrence and metastasis.

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Research Progress of Two-dimensional Matrix Detectors in IMRT Dose Verification

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Abstract: With the continuous development of science and technologies in China, radiotherapy technology in medical field has been very significantly developing, and intensity modulated radiation therapy (IMRT) technology has been the most widely used. This paper first introduces the components and types of two-dimensional matrix detector, two-dimensional ionization chamber matrix detector and two-dimensional semiconductor matrix detector, then analyzes the dosimetric characteristics of the two-dimensional matrix detector. In the end, the various applications of the two-dimensional matrix detector are analyzed and discussed in detail. The paper aims to promote the two-dimensional matrix detector's development in the field of radiotherapy in China.

Key words: Two dimensional matrix detector; Intensity modulated radiation therapy technology; Dose verification

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1 Introduction

Since entering the new period, radiotherapy technology in China has made remarkable achievements as science and technologies develop. In order to achieve better clinical treatment effects, radiotherapy technology has higher and higher requirements on dose. How to control the accuracy of dose more accurately is the key problem to be solved for current radiotherapy technologies. Intensity-modulated radiation therapy (IMRT) is one of the most advanced radiotherapy technologies over recent years as well as the most widely used radiotherapy technology now, having a great therapeutic effect on the medical clinical oncology treatment[1, 2]. As old methods of ionization chamber and film gradually outdated, two-dimensional matrix detector has become the most popular IMRT dose verification equipment in China.

2 The classification of two-dimensional matrix detectors

2.1 Two-dimensional ionization chamber matrix detector

Two-dimensional ionization chamber matrix detector, which is comprised of two-dimensional matrix plate, signal processing circuit, data processing and converter, supports octagonal module and computer data analysis system, and can help measure the point dose and two-dimensional dose distribution online in real time[3]. In addition, the two-dimensional ionization chamber matrix is highly efficient in IMRT dose verification, and can also measure the single modulated hadron field and the synthesized radiation field. The two-dimensional plate of the two-dimensional ionization chamber matrix contains hundreds, even thousands of miniature ionization chambers, the sensitive volume of which is small, basically at 0.1. Compared with the sensitive ionization chamber with large volume, this kind of ionization chamber can reduce the verification errors of the absolute dose of IMRT through modifying and improve the verification accuracy. Currently, the two-dimensional ionization chamber matrix used in clinical tumor radiotherapy is mainly divided into two types that one is the matrix composed of 1020 miniature ionization chambers with 7.62 mm ionization chamber spacing, and the other is the matrix composed of 729 stereoscopic columnar ionization chambers with 10 mm ionization chamber spacing.

2.2 Two-dimensional semiconductor matrix detector

The measurement of two-dimensional semiconductor matrix is also a common method for verifying IMRT dose. The components of this detector are consistent with those of two-dimensional ionization chamber matrix detector. Compared with the two-dimensional ionization chamber matrix detector mentioned above, the two-dimensional semiconductor matrix detector has the advantages of high sensitivity and resolution. Besides, the two-dimensional matrix plate in the two- dimensional semiconductor matrix detector contains a semiconductor detector with a sensitive volume of 1.9×10^{-5} cm^3. Like the two-dimensional ionization chamber matrix detector, the semiconductor matrix detector is divided into two types. One is a semiconductor detector, containing a matrix plate in 484 measurement area, that is separated by 7.07 mm in turn in the central part of the matrix plate, and a matrix, having 445 semiconductor detectors with thickness of 60 μm, that is separated by 14.14 mm from those in the peripheral part in the central part. The other is a two-dimensional semiconductor matrix detector with a measured area of 832 cm^2 and 1527 detectors with a space distance of 7.07 mm in the matrix, and such a space design can ensure a higher resolution of matrix measurement and improve the accuracy of IMRT dose verification.

We can infer that the effective measurement area interval of two-dimensional matrix detector is 484-832 cm^2 via comparing and summarizing two kinds of two-dimensional matrix detectors. In addition, this condition must be taken into account in the validation of dose to ensure the validation efficiency and accuracy. And if the space distance between detectors in the two-dimensional matrix plate is different, the measurement resolution of the matrix will be deviated. To correct the temperature and pressure value in the measurement process, the two-dimensional ionization chamber matrix plate needs to be equipped with temperature and pressure sensors, but the two-dimensional semiconductor matrix is not applicable. There is another significant difference between 2-D ionization chamber matrix detector and 2-D semiconductor matrix detector because of different structures and materials, so their effective sensitive volume is far from each other. The sensitivity of semiconductor detector is obviously much higher than that of ionization chamber detector. In terms of dose verification, the semiconductor detector has a range of 330 cGy, and it can maintain a good dose-measuring characteristic after long working hours. Therefore, all the circumstances that need to be considered should be integrated to select the most suitable two-dimensional matrix detector in the process of dose verification of IMRT.

3 Dosimetric properties of a two-dimensional matrix detector

3.1 Linearity of dose response and measurement repeatability

The dosimetric quality of the second-order matrix detector should be guaranteed in the process of dose verification, while the dosimetric response linearity is one of the most important dosimetric indexes of the two-dimensional matrix detector. Jersenecker and Nelms *et al.* found that the linear deviation of two-dimensional semiconductor matrix detector was <1% when the verification range was 5-300 cGy, and the linear deviation of two-dimensional ionization chamber matrix detector was <0.2% when the verification range was 100-500 cGy. Besides the linearity of the dose response, the measurement repeatability is also an important index. Moreover, Spezi *et al.* considered that the repeatability of experimental data was about 0.2% in a few hours under the condition of a fixed validation range for 100 cGy and a beam of 225 $cm^{2,}$ and the repeatability increased over time, eventually remaining around 1%. In addition, Amerio put the two dimensional ionization chamber matrix under the 6 MV X-ray to study the dose linear, which demonstrated that the measurement repeatability of ionization chamber matrix was very good under these conditions. Therefore, it can be obtained that the dose response linearity and measurement repeatability of the two-dimensional matrix can meet the dosimetric requirements for IMRT dose verification.

3.2 Energy dependence and lateral scattering

Owing to current imperfections of detector technology and the characteristics of manufacturing materials, two-dimensional matrix detector in the process of production does not guarantee that every dose response micro probes are exactly the same, so the two-dimensional matrix to the detectors for Jane occurs before leaving the factory, in order to achieve the consistency and accuracy of dose measurement. To explore the dose-dependent of two dimensional ionization chamber matrix, American experts in radiotherapy technology put the ionization chamber under the accelerator photon energy of 6, 10 and 15 MV to get relevant numerical readings. After comparing with the dosimeter reading, it was found that the energy response

error of the ionization chamber was <1.2%, which was a relatively ideal number, proving that the energy dependence of the ionization chamber was small. Part of the Chinese scholars had the corresponding experiments on two-dimensional ion chamber under different beam area of dose distribution, which displayed that there was a significant difference for the measured value between the existential center detector and ionization chamber due to the existence of the lateral scattering center. Based on this, the scholars conducted a convolution correction and found that the correction matrix measurement accuracy was improved obviously after correction. Therefore, before the application of two-dimensional matrix, the measurement of energy dependence under different energy photon lines and the calibration of lateral scattering should be carried out for the micro detector in order to reduce the measurement deviation.

3.3 Directional response

When conducting directional response detection on two-dimensional semiconductor matrix detector and two-dimensional ionization chamber matrix detector, researchers found that there was a certain degree of directional response difference in both of them. The two-dimensional matrix detector is composed of many miniature detectors arranged in a certain layout. Moreover, the incident angle of the ray under the same field is not exactly in unison, so when the central axis of the field is not perpendicular to the plane of the matrix detector, especially when the ray is parallel to the plane of the detector, the possible difference in directional responsiveness must be taken into account. Over recent years, with the further study of two-dimensional matrix detectors in China, it was found that if the two-dimensional matrix is added to the periphery of the appropriate thickness of the module, then this structure can reflect a good IMRT dose verification effect. The researches have shown that if the two-dimensional matrix plate is properly moved in the actual operation, the difference in directional response can be weakened or even eliminated. Therefore, the directional response should be adjusted when the two-dimensional matrix detector is used to verify the dose of IMRT.

4 The application of two-dimensional matrix detector

4.1 Application of ionization chamber matrix

Two-dimensional ionization chamber matrix detector has excellent performance in IMRT dose verification. Meanwhile, as a verification tool, it is also simple, efficient, accurate and reliable in the process of use. Due to its high verification accuracy, many radiotherapy experts have made many innovative applications of two-dimensional ionization chamber matrix. In the process of studying the ionization chamber matrix, Spezi used less than a quarter of an hour to assemble and debug the ionization chamber matrix, and then found a lot of meaningful properties of which in the dosimetry test. Firstly, the ionization chamber matrix had an independent energy response, which was a new breakthrough for the verification of IMRT's small field dose. Secondly, Spezi also found that the dose verification curve of the ionization chamber matrix was consistent with the scanning curve of the ionization chamber in the tank under IMRT. Moreover, Jia *et al.* found that the final results were similar after measuring different ionization chamber matrices. Besides, Ren *et al.* verified 100 cases of IMRT, and found that the verification results basically met the international dose deviation standard, and the pass rate of the entire IMRT dose could reached up to 97%. When Wizluk used the ionization chamber matrix to measure the flatness and repeatability of the field, he found that the measurement accuracy of the two-dimensional ionization chamber matrix could achieve good accelerator quality control. Cybernetan discovered that the ionization chamber matrix could not only provide good quality control for the accelerator, but also improve the efficiency of IMRT dose verification in the research center of two-dimensional matrix.

4.2 Applications of semiconductor matrices

Compared with the traditional film dosimeter, two-dimensional semiconductor matrix dosimetry characteristics, the dose of linearity and repeatability characteristics in particular is more outstanding. As it was specifically designed to verify the IMRT doses of a validation work, the actual operation of which is more simple than film dosimeter, its measuring precision stays at a good level, in the measurement of absolute dose also has the very good application. Chen *et al.* tested the accuracy of dose verification of two-dimensional semiconductor matrix through experiments, and the test results showed that when the dose position was limited under standard conditions, the pass rate of relative doses of all radiation fields could reach 85%-100%. Many radiotherapy institutions are using two-dimensional semiconductor matrix to verify the dose of IMRT, and in the process of clinical application, they have also innovated matrix verification methods to replace the

combination of film dosing method and ionization chamber matrix for IMRT dose verification method.

5 Conclusion

In summary, how to control the accuracy of dose more accurately is of great significance for the improvement of current radiotherapy technology level. Two-dimensional ionization chamber matrix detector has great advantages in IMRT dose verification and can significantly improve the efficiency of IMRT dose verification and has a very outstanding contribution in the offset of semiconductor matrix, and exerts important effects in the field of radiation therapy in China.

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Simultaneous Bilateral Thoracoscopic Pneumonectomy for Early Multiple Primary Lung Cancer Feasibility Analysis

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[Abstract] ***Objective:*** To analyze the feasibility of simultaneous bilateral thoracoscopic lung resection in the treatment of multiple primary lung cancers in the early stage. ***Methods:*** The study time range is between March 2019 and March 2021. A sample of 30 patients with early multiple primary lung cancer admitted to this hospital were included, and they were divided into a study group, a control group, and samples within the group using a random number table scheme n=15, patients in the control group underwent staged bilateral thoracoscopic pneumonectomy, and patients in the study group underwent bilateral thoracoscopic pneumonectomy at the same time. The indicators of the two groups were compared and analyzed. ***Results:*** There was no significant difference in the operation time and intraoperative blood loss between the two groups (P>0.05). There were significant differences in the VAS score, total length of hospital stay, and total surgical costs on the first day after surgery (P<0.05); there was no significant difference in the two groups' postoperative recovery indicators and the incidence of complications (P>0.05). ***Conclusion:*** It is safe and feasible to treat patients with multiple primary lung cancer in both lungs at the same time with simultaneous bilateral thoracoscopic surgery, and is suitable for promotion.

Key words: The same period; Bilateral thoracoscopic lung resection; Early multiple primary lung cancer

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1 Introduction

Lung cancer, also known as primary bronchial lung cancer, is a malignant tumor that originates from the lungs, bronchus, trachea, and other areas. Specific pathological types include large cell carcinoma, small cell carcinoma, squamous cell carcinoma, adenocarcinoma, etc. Patients with lung cancer have no typical clinical manifestations at the initial stage of onset, and can induce sputum expectoration, hemoptysis, chest pain, and dyspnea as the condition changes. The mortality rate is high, which has a serious impact on the quality of life of patients[1]. Early multiple primary lung cancers belong to the category of non-small cell lung cancer, which can occur in bilateral or unilateral lung lobes, including multiple histological types. The main programs for clinical diagnosis of early multiple primary lung cancer are bilateral thoracoscopic lobectomy, sublobectomy combined with lymph node dissection, and ipsilateral bilateral thoracoscopic lobectomy combined with lymph node dissection, etc[2]. There are still controversies about the clinical efficacy of concurrent or staged surgical treatment. This study summarizes and evaluates the basic data of early multiple primary lung cancer patients in our hospital, and studies and evaluates the related issues of bilateral thoracoscopic lung resection during the same period.

2 Materials and methods

2.1 General information

The study time range is from March 2019 to March 2021. A sample of 30 patients with early multiple primary lung cancer were admitted to this hospital, and they were divided into a study group and a control group using a random number table scheme. The samples within the group were n= 15. The basic data of the two groups of patients were

summarized and analyzed. The study group had 8 males and 7 females. The age range spanned from 40 to 58 years old, with an average of (49.58±2.44) years old, and the tumor diameter is (2.54±1.07) cm. In the control group, there were 9 males and 6 females. The age ranges from 41 to 60 years old, with an average of (50.27±2.47) years old, and tumor diameter (2.59±1.04) cm. Differences in baseline data had no effect on the conclusion of this study (P>0.05).

Inclusion criteria: Early-stage multiple primary lung cancer was diagnosed by CT and pathological examination, no distant metastasis or lymph node metastasis, maximum tumor diameter was less than 3.0 cm, in line with surgical indications, and agreed to participate in this study.

Exclusion criteria: Patients with other malignant tumors, no indications for surgery, and other patients who cannot cooperate with this study.

2.2 Methods

Before surgery, both groups of patients underwent basic examinations such as cranial MRI, enhanced CT of the chest and above, and abdominal ultrasound. Patients in the study group underwent bilateral thoracoscopic pneumonectomy at the same time. The physician evaluated the size, density, and location of the patient's lesions, and selected appropriate surgical treatment options based on the results of frozen histopathological examinations and the status of the remaining lung nodules, including unilateral lobectomy + Unilateral segmental or wedge resection (sublobectomy); bilateral segmental resection or wedge resection. Single-port or three-port thoracoscopy was used for lobe and segment resection, and single-port thoracoscopy was used for unilateral wedge resection. Sampling or lymph node dissection was performed after the resection was completed.

The patients in the control group underwent staged bilateral thoracoscopic pneumonectomy. The operation plan was the same as that in the study group, and the operation interval was 3-6 months. After the operation, the two groups of patients were followed up and regularly reviewed by taking tumor markers, chest CT, abdominal ultrasound, MRI, whole body bone scan, etc. The treatment plan was adjusted according to the results of the review.

Evaluation criteria

Intraoperative blood loss, operation time, VAS score on the first day after operation, total hospital stay, total operation cost and other indicators were compared between the two groups. Statistics on the related indicators of postoperative recovery and the incidence of various complications of the two groups of patients.

Statistical methods

SPSS23.0 software was used to calculate various data. In this study, the measurement data is ($\bar{x}$ ±s), the test method is t, the count data is (%), and the test method is $\chi 2$. If P<0.05, there is a difference between the groups.

3 Results

3.1 Comparison of the intraoperative blood loss, operation time and VAS score on the first day after surgery, total hospital stay and cost indicators

There was no significant difference in operation time and intraoperative blood loss between the two groups (P>0.05); the VAS score on the first day after surgery was higher in the study group than in the control group (P<0.05); the total length of hospital stay and total surgical expenses in the study group were significantly lower than the control group (P＜0.05) (Table 1).

Table 1. Comparison of intraoperative blood loss, operation time and VAS score on the first day after operation, total hospital stay and cost indicators ($\bar{x}$ ±s)

Group	Intraoperative blood loss (ml)	Operating time (min)	VAS score on the first day after operation	Total hospital stay (d)	Total hospital cost (yuan)
Study group (n=15)	94.42±7.15	185.77±48.35	2.79±0.48	7.25±1.69	22018.62±827.79
Control group (n=15)	95.26±5.43	185.68±22.79	2.03±0.27	13.86±2.77	30577.79±869.92
t	0.362	0.006	5.344	7.889	27.605
P	0.719	0.994	0.000	0.000	0.000

3.2 Comparison of related indicators of postoperative recovery between the two groups

There was no significant difference between the two groups of related indexes of postoperative recovery (P>0.05) (Table 2).

Table 2. Comparison of related indexes of postoperative recovery between the two groups ($\bar{x}$±s, d)

Group	Postoperative activity time	Extubation time
Study group (n=15)	2.84±0.22	3.03±0.49
Control group (n=15)	2.91±0.38	3.17±0.58
t	0.617	0.714
P	0.541	0.481

3.3 Comparison of the incidence of complications between the two groups

There was no significant difference in the incidence of various complications between the two groups (P>0.05) (Table 3).

Table 3. Comparison of the incidence of complications between the two groups (n/%)

Group	Infection	Pleural effusion	Air leakage	Pulmonary infection
Study group（n=15）	1（6.7）	2（13.3）	1（6.7）	2（13.3）
Control group（n=15）	2（13.3）	3（20.0）	1（6.7）	1（6.7）
χ2	0.370	0.240	0.000	0.370
P	0.542	0.624	1.000	0.542

4 Discussion

Lung cancer is a malignant tumor with a high clinical incidence. Early multiple primary lung cancer is a special type of non-small cell lung cancer. Such patients receive timely targeted surgical treatment for a 2-year survival rate of about 40-90%, and a 5-year survival rate of about It is 35-75%. CT examination is required before surgical resection of early multiple primary lung cancers to accurately identify whether the patient has metastasis and other problems, and to determine the scope of resection on the basis of preserving healthy lung tissue, through segmental resection, lobectomy, wedge resection and other operations The program achieves the therapeutic effect[3].

4.1 Analysis of the advantages of bilateral thoracoscopic lung resection during the same period

The main features of thoracoscopic surgery are minor trauma, accurate removal of the lesion tissue, rapid postoperative recovery, and good incision aesthetics. It has been widely used in clinical surgical treatment of various diseases. The clinical application value of simultaneous and staging bilateral thoracoscopic lung resection is still controversial. The clinical application of staged surgery is widely used, and its main drawback is that the interval between two operations is long. During this period, tumor progression can increase the difficulty of treatment. And the treatment cost is expensive, and the complication rate is high[4]. Simultaneous bilateral thoracoscopic pneumonectomy is a clinically widely used early treatment plan for multiple primary lung cancers in recent years. It can effectively solve the problems of tumor progression in staging surgery. The use of thoracoscopy to assist in completing the operation during the operation can significantly reduce surgical trauma and improve the safety of surgery. In the early clinical application, bilateral thoracoscopic pneumonectomy mostly adopts lobectomy and wedge resection. With the development of related technologies, anatomical segment resection is increasingly widely used. This surgical method can be based on complete resection of the lesion. The healthy lung tissue is preserved to the greatest extent, the operation has the characteristics of minimal invasiveness, and the safety of bilateral thoracoscopic surgery in the same period is significantly improved.

Early stage patients with multiple primary lung cancer undergoing thoracic surgery often use double-lumen endotracheal intubation combined with intravenous anesthesia, and need to complete the surgical treatment under one-lung ventilation. Some patients need to remove

local lung tissue or lung lobes during the operation, or even complete the whole operation. Lung resection. By adopting a staged surgical treatment plan, the residual lung tissue cannot meet the basic requirements of one-lung ventilation, resulting in some patients unable to remove residual lung masses through surgical treatment. At the same time, the number of bilateral thoracoscopic lung resections during the same period is less, which can reduce the cost of surgery, reduce the psychological burden of patients, and significantly shorten the overall recovery time. In addition, the staging operation mode has a time window between two operations, during which the body is prone to form a variety of growth factors and inflammatory factors, which in turn leads to tumor progression. There is no time window between two operations in the concurrent operation mode, and the risk of tumor progression is significantly reduced[5].

4.2 Data analysis of this study

In this study, patients undergoing bilateral thoracoscopic pneumonectomy during the same period had no history of lung disease, and there was no abnormality in lung function before operation. The time to get out of bed was (2.84±0.22) d, and the time to extubation was (3.03±0.49) d, the overall hospitalization time was (7.28±1.64) days, and there was no significant statistical difference compared with the control group. There was no significant difference in the incidence of various complications between the two groups. It can be considered that the operation mode at the same time had no adverse effect on the postoperative recovery, did not lead to a significant increase in the incidence of complications. There was no significant difference in operation time and intraoperative blood loss between the two groups. The VAS score of the patients in the study group was higher than that of the control group on the first postoperative day, and the total hospital stay and total operation costs were lower than those in the control group. It can be considered that the same operation can shorten the overall treatment Time, reduce the cost of surgery. In order to ensure the smooth completion of bilateral thoracoscopic lung resection during the same period, CT scans must be used to accurately locate the lesion tissue before the operation, and the vital signs of the patient must be closely monitored during the operation to ensure the safety of the operation. At the same time, the results of this study showed that the VAS scores of the patients in the study group were significantly higher than those in the control group on the first day after surgery. It can be considered that bilateral thoracoscopic lung resection in the same period can lead to postoperative pain aggravation. For this reason, postoperative analgesia interventions need to be strengthened, and instruct patients to carry out respiratory function training to prevent lung infections.

4.3 Precautions related to bilateral thoracoscopic lung resection during the same period

In order to ensure the efficacy and safety of bilateral thoracoscopic pneumonectomy during the same period, physicians need to strictly grasp the indications of surgery, assess whether the patient has adhesions in the thoracic cavity, whether there is distant metastasis of the lesion, whether there is abnormal cardiopulmonary function, etc., if the patient does not meet the surgical guidelines, other treatment options are required. During the operation, doctors need to perform detailed operations such as anatomy and closely monitor the changes in the patient's vital signs. In order to relieve postoperative pain, promote sputum and cough, they can choose 16# gastric tube and other thin tubes for bilateral chest drainage. Respiratory management needs to be actively carried out after the operation, and intervention measures such as bedside fiberoptic bronchoscopy can be used to reduce the incidence of lung infections.

Based on the above analysis, it can be seen that the simultaneous bilateral thoracoscopic pneumonectomy for patients with early multiple primary lung cancer has a significant effect and high safety, and can be comprehensively promoted in medical institutions at all levels. At the same time, the total number of patients included in this study is small, there is a lack of comparative research and analysis of the same type of data, the total research time is short, and the process design needs to be continuously improved. The clinical application value of simultaneous bilateral thoracoscopy pneumonectomy in the treatment for patients of early multiple primary lung cancer at the same time still needs continuous research and analysis.

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A Case of A1 Wide-necked Aneurysm Embolization via the Front Communicating Artery

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Abstract: With the development of radiography, especially digital subtraction cerebrovascular angiography, which is widely used in clinical practice, interventional embolization of intracranial aneurysms has become more and more popular due to its advantages of minimal invasiveness, high efficiency, and rapid postoperative recovery. The choice of patients, often we have to formulate an unconventional and individualized treatment plan based on the specific conditions of each patient's blood vessel. This case is a segment A1 aneurysm of the right anterior cerebral artery. Due to its special location and wide diameter, in order to reduce the difficulty and risk of the operation during the operation, a bilateral internal carotid artery approach was developed to complete the stent-assisted procedure and special treatment plan for aneurysm embolization.

Key words: A1 segment of anterior cerebral artery; Wide aneurysm; Stent assist; Reunion embolization

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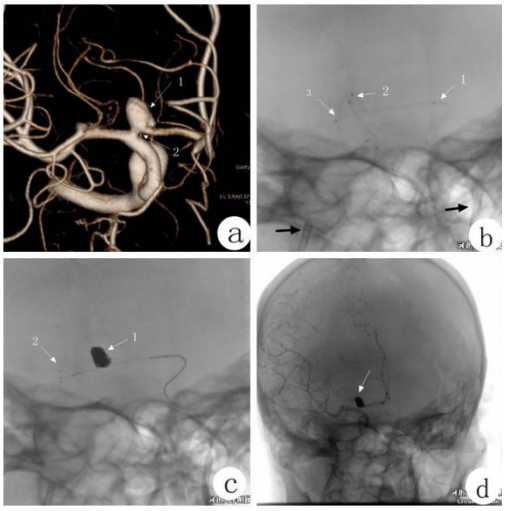
Anterior cerebral artery A1 segment aneurysms have a low incidence rate and a special location. The A1 segment starts at a right or approximately right angle from the end of the internal carotid artery. It is difficult to embolize the microcatheter in place, and the operation is more difficult and risky.

Case: A 48-year-old female patient was admitted to the hospital after a physical examination revealed an intracranial aneurysm within 10 days. The head and neck CTA showed an aneurysm in the A1 segment of the right anterior cerebral artery. Whole brain angiography: wide-necked aneurysm of the proximal A1 segment of the right anterior cerebral artery. Head and arm dry, bilateral carotid arteries opening and running are not abnormal, and the anterior communicating arteries are open. Combined with the DSA examination, the surgical plan was formulated: bilateral approach is possible, stent-assisted aneurysm embolization, aspirin 100mg qd and clopidogrel bisulfate tablets 75mg qd orally 3 days before surgery.

Surgical procedure: Use modified Seldingers technique to puncture bilateral common femoral arteries, introduce 6F femoral artery sheaths bilaterally, insert 6F guide tube through right femoral artery sheath to superselect to right internal carotid artery, use 6F guiding catheter, micro-guide wire. Slowly intubate two embolic microcatheters into the aneurysm cavity of the A1 segment of the right anterior cerebral artery. Because the aneurysm neck is wide, a stent is needed to reshape the aneurysm neck, and then the 6F guide is inserted through the left femoral artery sheath catheter, the 6F guiding catheter is superselected to the left internal carotid artery, the micro-guide wire guides the stent microcatheter through the left anterior cerebral artery A1 segment-the anterior communicating artery slowly intubated to the beginning of the right anterior cerebral artery A1, half release the stent (4x15mm) to reshape the aneurysm neck, and the wide aneurysm neck to reshape the narrow aneurysm neck. At the same time, the presence of the stent increases the stability of the two embolic microcatheters, and then the coils are alternately inserted into the two embolic microcatheters. After all the stents were released, the angiography showed that the aneurysm was completely embolized and the bilateral anterior cerebral arteries were well developed.



a: Visible aneurysm, wide neck, the aneurysm neck is close to the beginning of segment A1, and forms an acute angle with the internal carotid artery. b: Arrows 1 and 3 are stent microcatheters, 2 are 2-strip embolization microcatheters, and the two black arrows are 6F guiding catheters in the bilateral internal carotid arteries. c: Arrow 1 is an aneurysm after embolization, 2 is a stent. d: The embolization of the aneurysm is complete, the anterior communication is still open, and the bilateral anterior cerebral arteries are well developed.

Discussion

The A1 segment of the anterior cerebral artery is at right angles or approximately right angles from the end of the internal carotid artery. Most of them are not straight from the posterolateral and obliquely anterior to the inside, but have different forms of curvature[1]. Clinically, the morphological variation of the A1 segment of the anterior cerebral artery is more common. The abnormality and variation of A1 mainly include bilateral unequal size, unbalanced development, dysplasia, and absence. The internal aneurysm is less than 1%[2]. In terms of treatment, there are two methods: surgical aneurysm clipping and interventional embolization of aneurysm. The interventional embolization of aneurysm has the advantages of minimal invasiveness, high efficiency, and quick postoperative recovery. It is easier to be used and accepted by patients and their families[3]. For the treatment of wide-necked aneurysms, the stent combined with coil technology proposed by Geremia *et al*. is a milestone in this field. This technology can make the aneurysm packing more compact and prevent the coil from penetrating into the tumor-bearing artery to cause stenosis and avoiding the coil. Escape and cause ectopic embolism. At the same time, the stent can cover the neck of the aneurysm to change the blood flow pattern in the aneurysm, reduce turbulence, reduce intratumoral pressure, promote intratumoral thrombosis, organize intratumoral tissue, and provide conditions for vascular endothelial cells to promote healing of aneurysms[4]. There are reports of 11 cases of A1 segment aneurysms, 7 cases of simple coils, 3 cases of stent-assisted coils, and 1 case of balloon-assisted embolization. All were successful without complications[5]. It has also been reported that the A1 wide-necked aneurysm adopts the method of occluding the tumor-bearing artery. The premise is that there are anterior communicating arteries and the bilateral Al segments are well developed (observed by neck compression or BOT), but there is still a risk of A1 perforating artery occlusion. This method should be used with caution[6].

In this case, the aneurysm is located in the A1 segment of the right anterior cerebral artery and is only about 2 mm from the end of the internal carotid artery. The biggest difficulty in interventional embolization is the accurate placement of the embolic microcatheter and the stability of the stent release process. This anatomical structure requires that the embolization microcatheter is close to the left side of the internal carotid artery to enter the A1 segment, and then immediately turn back to enter the aneurysm cavity. The operation process is difficult and the risk is high. In order to ensure the smooth and safe embolization of the microcatheter, the tip of the microcatheter needs to be in an "S" shape[7]. If the stent microcatheter still enters the tumor-bearing artery through the right internal carotid artery, due to the existence of the angle between the A1 segment and the internal carotid artery, it is difficult to ensure the stability of the stent positioning and release process, which increases the difficulty and risk of the operation. The upper whole passage has passed through 3 sets of systems, 2 embolic microcatheters and 1 stent microcatheter. During the release of the stent, the 3 microcatheters will affect each other, which increases the difficulty and risk of the operation. Therefore, the embolization microcatheter is inserted through the right approach to embolize the aneurysm, and the stent microcatheter is placed through the left approach to release the stent. The bilateral meeting plan effectively increases the stability of the stent release process and avoids 3 microcatheters. The mutual influence between them reduces the difficulty of the operation and reduces the risk during the operation. However, not every patient with segment A1

aneurysm is suitable. The patency of the bilateral approach is assessed by angiography before operation, and there is no obvious variation in the bilateral A1 segment. The patency of the anterior communicating artery is the basis.

In summary, endovascular embolization for A1 segment of anterior cerebral artery aneurysm is currently the most effective treatment method. According to the different conditions of the patient's blood vessels, personalized selection of the appropriate surgical method can significantly reduce the difficulty of the operation and the risk of the operation and has a positive impact on the prognosis of patients.

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Application of Quality Control Circle in Improving the Success Rate of Indwelling Needles in Patients

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[Abstract] ***Objective:*** This study aims to assess the effectiveness of quality control circles (QCCs) in improving the success rate of intravenous indwelling needles among patients. ***Methods:*** The study included 1136 patients, that were admitted to the kidney and thoracic surgery wards of the First Affiliated Hospital of Jinan University from June 2019 to December 2019. The patients were using an indwelling needle each. They were divided into two groups: 1) control group (n = 232), where patients received regular nursing interventions; 2) intervention group (n = 904), where patients received QCC nursing intervention. ***Result:*** The fishbone diagram analysis revealed that poor training, lack of indwelling needle-related evaluation sheet, and lack of dynamic assessments were the factors that contributed to indwelling failure. In addition, the average indwelling duration of the intervention group was significantly higher than that of the control group. The success rate of indwelling needles in the intervention group (67.8%) was also significantly higher than that of the control group (48.3%), where $p < 0.05$. Furthermore, the intervention group (seepage = 19.9%; phlebitis = 6.7%) reported a significantly lower prevalence of the main factors of indwelling needle failure than the control group (seepage = 34.5%; phlebitis = 8.6%), where $p < 0.05$. ***Conclusion:*** The implementation of QCC can effectively reduce the occurrence of complications and nursing risks as well as improve the success rate of intravenous indwelling needles among patients.

Keyword: Quality control circle; Intravenous indwelling needle; Indwelling success rate

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1 Introduction

An intravenous indwelling needle is one of the most common tools for peripheral intravenous infusion [1]. Recent studies have reported that over 70% of hospitalized patients had used indwelling needles, and 69% of them experienced indwelling failure [2]. This indwelling failure was attributed to several causes: 1) indwelling needle displacement; 2) blockage of venous catheter; 3) fluid leakage; 4) oozing; 5) infection [3,4]. Removal before treatment completion causes discomfort and pain to the patient due to re-puncture. It also increases the usage of intravenous catheter during the treatment process. Moreover, in severe cases, this process may affect the duration for patients' intravenous medication. Therefore, improving the success rate of indwelling needles has become an urgent issue in clinical nursing. Recently, quality control circles (QCCs) have played important roles in improving the quality of medical treatment, and are widely applied in the field of hospital management [5]. Therefore, this study aims to evaluate the effectiveness of QCCs in improving the success rate of indwelling needles among patients.

2 Methods

2.1 Participant Selection and Data Collection

This study included 1136 patients with indwelling needles that were admitted to the kidney and thoracic surgery wards of the First Affiliated Hospital of Jinan University from June 2019 to December 2019. They were divided into a control (n = 232; males = 117, females = 55) and an intervention group (n = 904; males = 612, females = 292), based on their admission date. Those admitted from June 1 to June 30, 2019, were assigned to the control group (age range: 18-83 years old) and were treated before the implementation of QCCs. Similarly, those admitted from July 1 to December 31, 2019,

were assigned to the intervention group (age range: 12-89 years old) and treated along with the implementation of QCCs.

The inclusion criteria for participants were as follows: (1) patients who received intravenous indwelling infusion treatment in the kidney and thoracic surgery wards from June 1 to December 31, 2019; (2) patients with functional expression and communication skills; (3) patients who agreed to participate in this study. The exclusion criteria were as follows: (1) patients with mental disorders and dementia; (2) patients who underwent surgery or chemotherapy during the indwelling needle infusion.

2.2 Regular Nursing Intervention for Patients in the Control Group

The regular nursing invention included puncture, fixation, regular tube flushing and sealing, replacement of infusion joints and dressings, as well as infusion of drugs as per prescription by the doctors.

2.3 QCC Nursing Intervention for Patients in the Intervention Group

The standard QCC nursing intervention followed these steps: theme selection → activity plan implementation → status quo evaluation → goal-setting → analysis → strategy formulation → strategy implementation and review → effect confirmation → standardization → review and improvement.

2.4 Data Analysis

The success rate of needle indwelling at the peripheral vein was determined using the following criteria: 1) the retention time of peripheral intravenous catheter (PIVC) ≥ 72 hours; 2) completion of intravenous therapy throughout the indwelling of the needle. The success rate of the indwelling needle was computed and the factors contributing to the failure of the indwelling needle was analyzed in order to determine the patients' response to the indwelling needle. A plato analysis was also performed to identify the improvement focus for QCC and set the target accordingly, while a fishbone diagram analysis was performed to identify the cause of the indwelling needle failure. Additionally, countermeasures were formulated after identifying the factors for the indwelling needle failure. These proposed countermeasures were implemented from July 1, 2019, for the patients in the intervention group.

The data collected from the intervention group were analyzed. Furthermore, the success rate of indwelling needles in the intervention group was computed to analyze the factors for indwelling failure in the control group.

Lastly, the success rate and the incidence rate of factors causing indwelling failure were compared between the intervention and the control group, respectively. The observation indicators of this study were the indwelling needle time and the factors leading to indwelling failure.

The data obtained were analyzed using Statistical Package for the Social Sciences (SPSS) version 22.0. Descriptive statistics were computed to perform t-test and chi-square tests to obtain the results.

3 Result

Plato induction and analysis revealed that before QCC implementation, exudation and phlebitis were the major causes for indwelling failure; thereby, being the focus points for the improvement with QCC implementation (**Figure 1**).

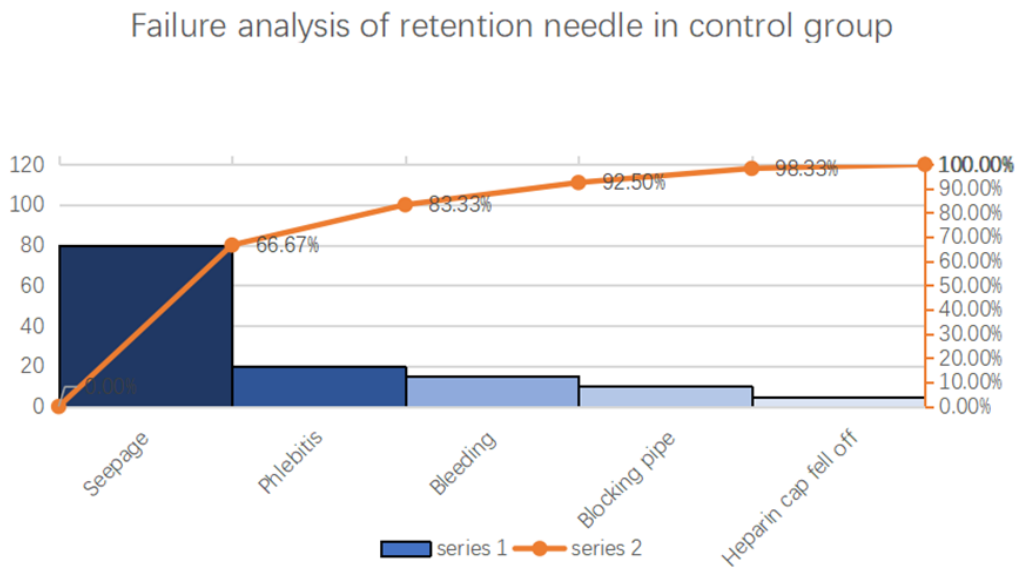

Figure 1. Analysis of the factors of indwelling failure in the control group

The two fishbone diagrams reported that the indwelling failure could be attributed to poor training, lack of indwelling needle-related evaluation sheet, and the lack of dynamic assessments (**Figure 2** and **Figure 3**). The diagrams also reported four main factors: 1) contractors; 2) management; 3) environment; 4) item. The analysis indicated the need for developing an indwelling needle-related evaluation sheet and an appropriate training model.

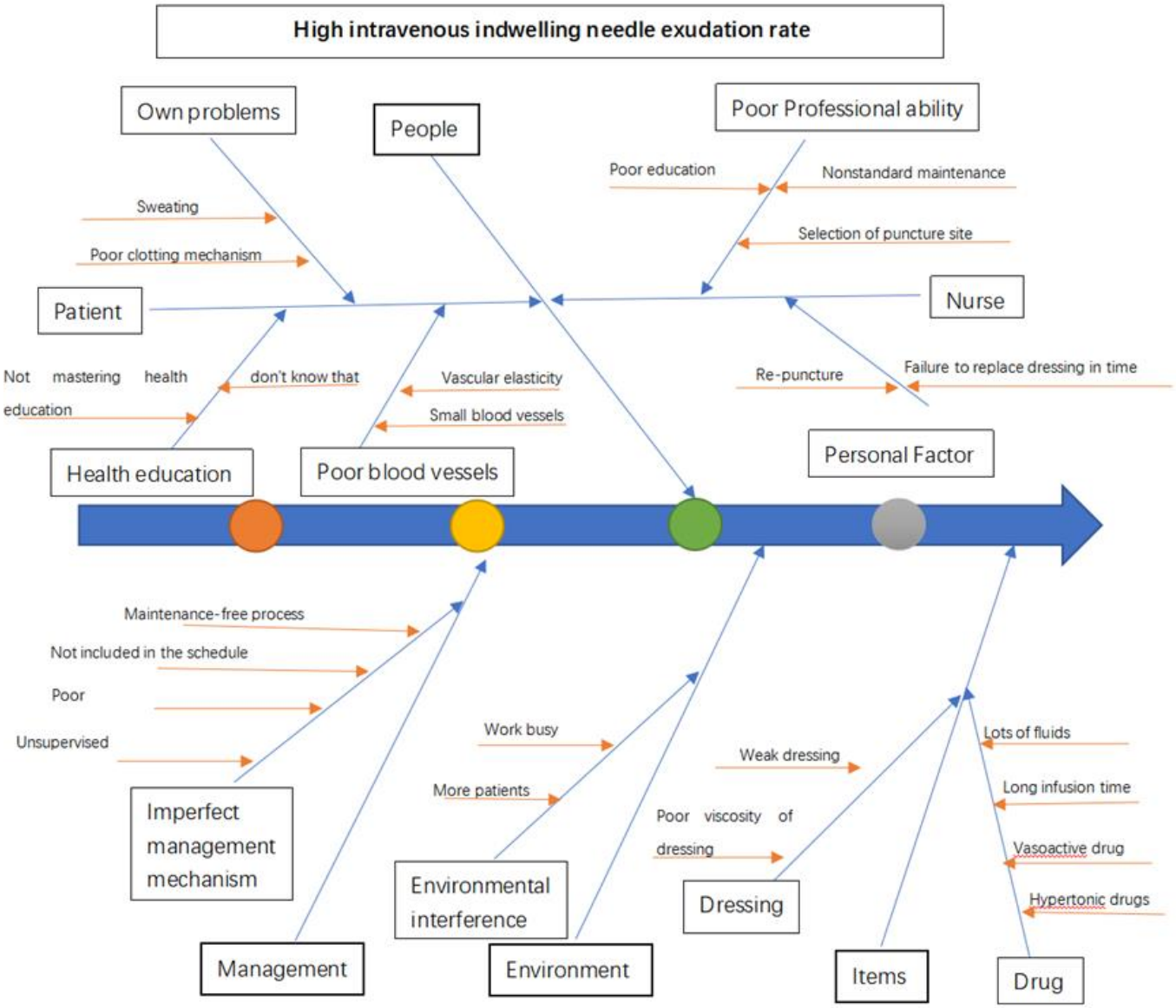

Figure 2. Fishbone diagram of the factors of indwelling failure

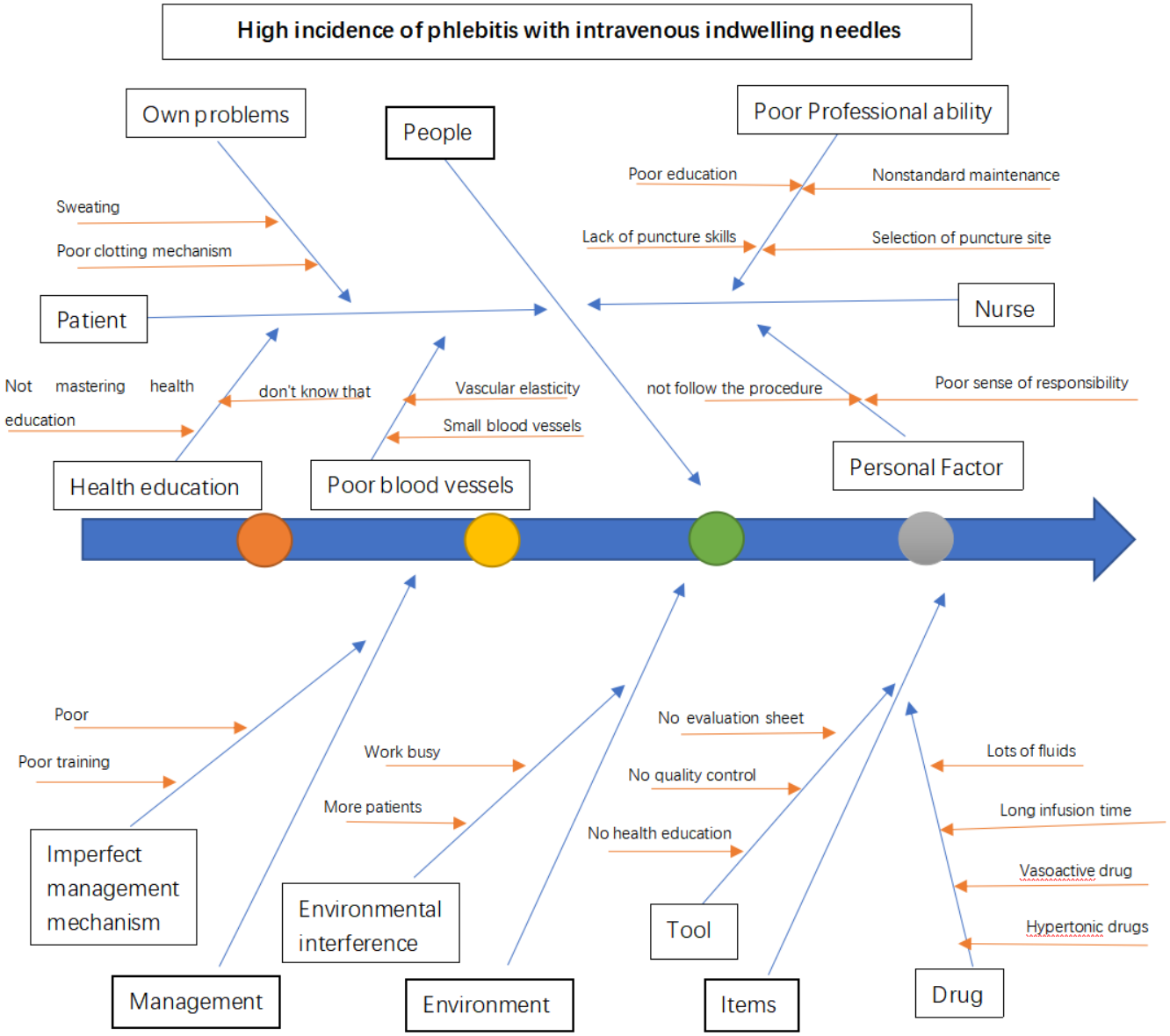

Figure 3. Fishbone diagram of the factors of indwelling failure

Table 1. Comparison of the indwelling duration between two groups of patients

Group	Indwelling duration (hours)	Average indwelling duration (hours)
Control group	1.7 - 151.0	39.7±32.2
Intervention group	2.0 - 288.5	64.3±43.9
t		-8.013
p value		0.000

The longest indwelling duration was 288.5 and 151 hours for the intervention and control group, respectively. The average indwelling duration of the intervention group (64.3± 43.9 hours) was significantly higher than that of the control group (39.7±32.2 hours; $p < 0.05$) (**Table 1**).

As shown in **Table 2**, the success rate of indwelling needles in the intervention group (67.8%; 613/904) was significantly higher than that of the control group (48.3%; 112/232), where $p < 0.05$.

Table 2. Comparison of the success rate of indwelling needles between the two groups

Group	Indwelling success (n (%))	Indwelling failure (n (%))
Control group (n = 232)	112 (48.3)	120 (51.7)
Intervention group (n = 904)	613 (67.8)	291 (32.2)
X^2		30.509
p value		0.000

The comparison of the main factors of indwelling failure between the two groups revealed that these factors were significantly lower in the intervention group (seepage = 19.9%; phlebitis = 6.7%) than the control group (seepage = 34.5%; phlebitis = 8.6%), where $p < 0.05$ (**Table 3**).

Table 3. Comparison of the main factors of indwelling failure between the two groups (n (%))

Group	Indwelling success	Seepage	Phlebitis	Bleeding	Blockage	Heparin cap fell off	Other
Control group (n = 232)	112 (48.3)	80 (34.5)	20 (8.6)	11 (4.7)	7 (3.0)	2 (0.9)	0 (0)
Intervention group (n = 904)	613 (67.8)	180 (19.9)	61 (6.7)	9 (1.0)	12 (1.3)	5 (0.5)	24 (2.7)
X^2							53.384
p value							0.000

4 Discussion

Intravenous indwelling needle is a widely applied nursing technique in clinical practice. This technique is effective in avoiding pain caused by repeated puncture, protecting the patients' blood vessels to a certain extent, and improving the patients' comfort level during treatment [1]. Existing research have suggested that the success rate of indwelling needles for patients benefited from the safe and effective improvement of indwelling time for patients as well as the reduction of discomfort caused by repeated punctures [4]. In this study, the effectiveness of QCCs for indwelling needle was assessed by comparing the indwelling needle duration and performing a fishbone analysis.

The findings indicated that exudation, as one of the primary influencing factors, is related to puncture technique and daily maintenance. During the puncture process, if the needle fails to enter the blood vessel in the first attempt, it needs to exit the outer wall of the blood vessel to re-enter. Despite the success of the re-entry process, this kind of indwelling needle tends to cause exudation. Currently, the puncture technique in clinics has garnered increasing attention and has been the focus of primary training for nurses; even routine standard maintenance training is considered inferior to it [6]. However, regular and standardized maintenance is extremely important to improve the success rate of indwelling needles. Therefore, in this study, a routine maintenance process for intravenous indwelling needles was designed along with a bedside shift schedule and all the nurses in the ward were trained accordingly. After implementing the bedside shift schedule, it was found that the application used for indwelling needles was loosely fitted 28 times in this study. The application was immediately replaced to prevent the detachment of the indwelling needle, provided it was noticed on time. In a study, Ota T. and other researchers reported that the catheter detachment rate was 1-26.7% due to loose application [7].

Furthermore, a quality control schedule was developed for indwelling needles, and it was led by the head nurse or group leader every week. This schedule strengthened the supervision of indwelling needle nursing, thus improving the level of daily indwelling needle nursing.

Additionally, this study also reported that phlebitis is another major factor affecting the success rate of indwelling needles. The Visual Infusion Phlebitis scale was used to evaluate patients with phlebitis [8,9]. Most patients reported grade 1 phlebitis, where they experienced slight pain or redness around the intravenous injection site, while a few reported grade 2 phlebitis, which was characterized by pain, redness, and swelling at the injection site. There was no report

of phlebitis more than grade 2. Phlebitis is related to the expertise of puncturing and routine maintenance, and it varies for different sites of catheterizations [10]. For example, the incidence of phlebitis for indwelling needles is lower at the forearm than at the back of the hand. Moreover, phlebitis is related to the infusion of medicine, where administration of irritant drugs and hypertonic medications, such as mannitol, can easily result in phlebitis. Therefore, chemotherapy and vasoconstrictor drugs are not suitable for intravenous indwelling catheter infusion; instead, a central venous catheter infusion should be alternatively adopted. Therefore, nurses should continuously improve their puncture expertise and routine maintenance level, in addition to practicing the selection of blood vessels with thicker outer diameter, straighter direction, and better elasticity while recognizing the forearm blood vessels as a better choice.

Despite the short study duration, an improvement rate of 40.37% was observed; thus, full participation in nursing quality management is conducive in improving performance quality and the nursing team development.

5 Conclusion

QCC implementation can effectively reduce the occurrence of complications and nursing risks as well as improve the success rate of intravenous indwelling needle among patients.

Disclosure statement

The authors declare that there is no conflict of interest.

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[1] Yao Y., Xia B. Application of Phase Frequency Feature Group Delay Algorithm in Database Differential Access. Computer Simulation, 2014, 31(12): 238-241.

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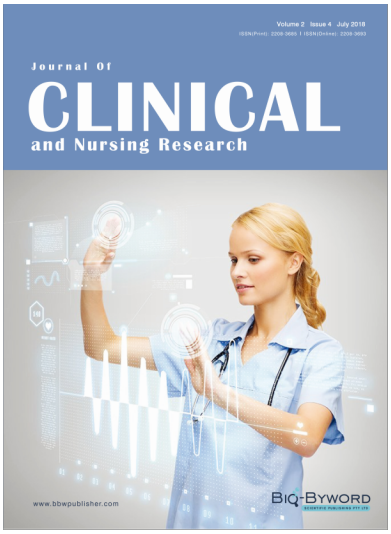

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