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Effect of Surgical Combination with Traditional Chinese Medicine Dialectical Therapy in Three Phases on Intertrochanteric Fracture of the Femur and Its Impact on Fracture Healing Time

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Abstract: *Objective:* To evaluate the effectiveness of surgical combination with traditional Chinese medicine dialectical therapy in three phases for the treatment of intertrochanteric fracture of the femur (IFF). *Methods:* 84 patients with IFF admitted to the hospital from December 2022 to December 2024 were selected and randomly divided into two groups using a random number table. The combined group received surgery and traditional Chinese medicine dialectical therapy in three phases, while the control group received surgery alone. The total effective rate, fracture healing time, hip function score, and lower extremity function score were compared between the two groups. *Results:* The total effective rate was higher in the combined group than in the control group ($P < 0.05$). After treatment, the fracture healing time was shorter in the combined group than in the control group, and the hip function and lower extremity function scores were higher in the combined group than in the control group ($P < 0.05$). *Conclusion:* Surgical combination with traditional Chinese medicine dialectical therapy in three phases can shorten the fracture healing time of IFF patients and restore their hip and lower extremity function, demonstrating significant efficacy.

Keywords: Surgery; Traditional Chinese medicine dialectical therapy in three phases; Intertrochanteric fracture of the femur; Fracture healing time

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1. Introduction

Intertrochanteric fracture of the femur (IFF) has an incidence rate of 1.4% among all fractures in the body, with elderly people being the high-risk group. Symptoms include hip pain, joint swelling, and limited mobility. Long-term development can lead to complications such as deep vein thrombosis or hypostatic pneumonia [1]. Surgery is a commonly used treatment that can fix the fracture end, promote fracture healing, and reduce the long-term harm of the disease. Proximal femoral nail antirotation (PFNA) is the main surgical procedure for this disease, providing

stable and durable internal fixation support, allowing patients to get out of bed early after surgery, thus achieving better surgical results. At the same time, combined with traditional Chinese medicine dialectical therapy in three phases, patients can receive staged and dialectical treatment based on their postoperative recovery stage, fully considering individual differences among patients. This treatment plays a role in promoting blood circulation and removing blood stasis, strengthening muscles and bones, nourishing the liver and kidneys, nourishing blood, and relieving pain [2]. Based on this, this study selected 84 IFF patients to evaluate the clinical advantages of surgical combination with traditional Chinese medicine dialectical therapy in three phases.

2. Materials and methods

2.1. General information

84 IFF patients admitted to the hospital from December 2022 to December 2024 were selected and randomly divided into two groups using a random number table. The combined group consisted of 42 patients, including 26 males and 16 females, aged between 40 and 81 years old, with a mean age of (54.68 ± 4.19) years old. The causes of fractures were violent blows in 25 cases and falls from heights in 17 cases. The Evans fracture classification was type IA in 4 cases, type IB in 13 cases, type IIA in 20 cases, and type IIB in 5 cases. The control group consisted of 42 patients, including 27 males and 15 females, aged between 41 and 84 years old, with a mean age of (54.77 ± 4.25) years old. The causes of fractures were violent blows in 24 cases and falls from heights in 18 cases. The Evans fracture classification was type IA in 7 cases, type IB in 13 cases, type IIA in 17 cases, and type IIB in 5 cases. There was no significant difference in baseline characteristics between the two groups ($P > 0.05$).

Inclusion criteria: diagnosed with IFF after imaging examinations such as X-rays; closed fracture; new fracture; normal cognitive and mental state; relatively complete clinical data; fully informed about the study. Exclusion criteria: presence of surgical contraindications; suffering from malignant tumors; abnormal liver and kidney function or immune system; accompanied by organic lesions; comorbidities such as infectious diseases; withdrawal from the study.

2.2. Methods

The control group underwent surgical treatment alone, specifically PFNA surgery. Preoperatively, the affected tibia was moderately tractioned, and targeted treatments such as anticoagulation or analgesia were administered. Patients were assisted to complete preoperative examinations such as lower extremity arteriovenous ultrasonography and echocardiography to ensure they met surgical indications. 30 minutes before surgery, patients were intravenously administered cefuroxime sodium at a dose of 1.5 g combined with tranexamic acid treatment, with an intravenous dose of 0.5 g. General anesthesia was performed, and patients were positioned supine on a traction table. After C-arm fluoroscopy, traction reduction was performed on the fracture end. The needle insertion site was at the apex of the greater trochanter of the femur, where a guide needle was inserted. The rationality of the guide needle's position was evaluated using fluoroscopy, and the marrow cavity was reamed. A PFNA main nail of appropriate diameter and length was selected and placed into the marrow cavity along the guide needle, which was then removed. With the help of an external bracket, the guide needle was placed inside the femoral neck, and fluoroscopy was performed again to ensure satisfactory angles of the guide needle and femoral neck anteversion. A spiral blade was then placed along the drilled hole. A locking screw (1 piece) was placed at the distal end of

the intramedullary nail, and the proximal end cap was tightened. The surgical field was repeatedly rinsed, and hemostasis was performed; a drainage tube was placed, and sutures were made. Postoperatively, cefuroxime sodium was intravenously administered every 12 hours at the same dose as before surgery, for a total of 2 infusions. Low molecular weight heparin sodium treatment was initiated 12 hours after surgery, and the drainage tube was removed 24 hours postoperatively. Small-scale functional training began 2 weeks after surgery, gradually increasing training intensity to allow patients to get out of bed and move as soon as possible.

The surgical therapy for the combined group was the same as above, with the addition of traditional Chinese medicine dialectical treatment in three phases: From 3 days to 2 weeks postoperatively, or early stage, Taohong Siwu Decoction was selected, consisting of prepared rehmannia root (15 g), angelica (15 g), white peony root (10 g), chuanxiong (8 g), peach kernel (9 g), and safflower (6 g). From 2 to 4 weeks postoperatively, or mid-stage, Shujin Huoxue Decoction was chosen, comprising cyathula root (9 g), dipsacus root (12 g), *Fineleaf schizonepeta* herb (9 g), *Mulberry mistletoe* (9 g), green tangerine peel (5 g), *Drynaria rhizome* (9 g), safflower (9 g), angelica (12 g), bitter orange (9 g), notopterygium root (9 g), five-leaved akebia root bark (9 g), eucommia bark (9 g), *Divaricate saposhnikovia* root (9 g), and *Doubleteeth pubescent angelica* root (9 g). From 4 weeks postoperatively until fracture healing, or late stage, Zhuangjin Yangxue Decoction was administered, including white peony root (9 g), angelica (9 g), chuanxiong (6 g), dipsacus root slice (12 g), safflower (6 g), rehmannia root (12 g), cyathula root (9 g), moutan bark (9 g), and eucommia bark (6 g). All medicinal herbs were taken once a day, divided into morning and evening doses.

2.3. Observation indicators

(1) Fracture healing time: The fracture healing time of the two groups was recorded.

(2) Hip function score: Before treatment and 3 months after treatment, the Harris scoring system was selected, including pain (44 points), function (47 points), range of motion (5 points), and deformity (4 points), totaling 100 points. The hip function was scored positively.

(3) Lower extremity function score: During the same time period, the Oswestry Lower Extremity Dysfunction Assessment Criteria (version 2.0) was chosen, consisting of 10 items including lumbar pain, personal daily care, and walking ability, with each item scoring 0–5 points, totaling 50 points. Lower extremity function was scored negatively.

2.4. Curative effect evaluation criteria

(1) Significant efficacy: Fracture symptoms disappeared, patients could take care of themselves, and there was no limping or pain.

(2) Initial efficacy: Fracture symptoms basically disappeared, patients could basically take care of themselves, joint movement was slightly restricted, and walking required the assistance of a cane.

(3) No efficacy: Fracture symptoms did not improve, patients had difficulty taking care of themselves, joint movement was severely restricted, and walking was not possible.

2.5. Statistical analysis

Data processing software was SPSS 28.0. Measurement data were expressed as mean ± SD (standard deviation), compared and tested using *t*-values. Count data were expressed as [*n*/%] and compared and tested using chi-square values. Statistical significance was defined as $P < 0.05$.

3. Results

3.1. Comparison of total effective rate between the two groups

The total effective rate of the combined group was higher than that of the control group ($P < 0.050$) (**Table 1**).

Table 1. Comparison of total effective rate between the two groups [*n*/%]

Group	Number of cases	Significant effect	Initial effect	No effect	Percentage
Combined group	42	22 (52.38)	19 (45.24)	1 (2.38)	97.62 (41/42)
Control group	42	16 (38.10)	18 (42.86)	8 (19.05)	80.95 (34/42)
χ^2					6.010
P					0.014

3.2. Comparison of fracture healing time between the two groups

The fracture healing time in the combined group was (11.05 ± 2.64) weeks, while in the control group it was (14.19 ± 2.74) weeks, with $t = 5.348$ and $P = 0.000$.

3.3. Comparison of hip function scores between the two groups

Before treatment, there was no difference in hip function scores between the two groups (P>0.05). After 3 months of treatment, the hip function score in the combined group was higher than that in the control group (P<0.05) (**Table 2**).

Table 2. Comparison of hip function scores between the two groups (mean ± SD, points)

Group	Number of cases	Pain		Function		Range of motion		Deformity	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Combined group	42	21.29 ± 3.12	35.16 ± 4.72	25.18 ± 3.97	38.95 ± 4.81	2.05 ± 0.46	4.10 ± 0.32	1.14 ± 0.28	3.01 ± 0.42
Control group	42	21.25 ± 3.10	31.09 ± 4.53	25.22 ± 3.91	34.02 ± 4.73	2.07 ± 0.49	3.88 ± 0.27	1.12 ± 0.28	2.81 ± 0.34
t		0.059	4.032	0.047	4.736	0.193	3.405	0.327	2.399
P		0.953	< 0.001	0.963	< 0.001	0.848	0.001	0.744	0.019

3.4. Comparison of lower limb function scores between the two groups

Before treatment, there was no difference in lower limb function scores between the two groups ($P > 0.05$). After 3 months of treatment, the lower limb function score in the combined group was higher than that in the control group ($P < 0.05$).

Table 3. Comparison of lower limb function scores between the two groups (mean ± SD, points)

Group	Number of cases	Before treatment	After treatment
Combined group	42	21.95 ± 4.18	41.98 ± 5.35
Control group	42	22.03 ± 4.14	37.18 ± 5.79
t		0.088	3.946
P		0.930	< 0.001

4. Discussion

IFF is a common comorbidity of osteoporosis, with a high incidence rate in hip fractures. Its inducements are mostly high-altitude falls or violent blows, which can severely affect the hip joint function of patients and lead to lower limb dysfunction [3]. The conservative treatment for patients with this disease is bone traction therapy, which can reset the fracture end, but requires long-term bed rest, which may lead to complications such as hip varus deformity or deep venous thrombosis of the lower extremities [4]. Therefore, surgical treatment is necessary for patients with this disease to improve long-term effectiveness.

PFNA is a commonly used intramedullary fixation surgery for IFF patients. The surgical incision is 5 cm long, and only a small range of soft tissue needs to be processed, which can prevent large-scale tissue dissection, thereby protecting the nerves and blood supply around the fracture end and reducing periosteal or soft tissue damage [5]. The use of spiral blades during the operation can play a role in anti-rotation and anti-bending, thereby improving the stability of internal fixation. In addition, this surgical method can reduce shear force, prevent slight movement of the cancellous bone interface, and prevent postoperative complications. Implanting spiral blades into the femoral neck can expand the area of contact between the blade and the cancellous bone and enhance the anchoring force generated by the blade, thereby reducing adverse events such as femoral head separation [6]. At the same time, combined with traditional Chinese medicine, three-phase dialectical treatment can promote postoperative recovery. Among them, the principles of early treatment are analgesia, promoting blood circulation, reducing swelling, and removing blood stasis; the principles of mid-term treatment are nourishing blood, activating collaterals, and relaxing muscles; the principles of later treatment are strengthening muscles and bones, and nourishing the liver and kidneys. Staged treatment can implement individualized and dialectical treatment according to the treatment needs of patients at different stages after surgery, thereby reducing postoperative symptoms such as pain, shortening the time for patients to get out of bed, and accelerating fracture healing [7].

The results showed that the total effective rate of the combined group was higher than that of the control group, the fracture healing time was shorter than that of the control group, and the hip joint function and lower limb function scores after treatment were higher than those of the control group ($P < 0.05$). The reason is that the combined use of traditional Chinese medicine three-phase dialectical treatment after PFNA surgery can ensure the efficacy of the surgery. Among them, in the prescription of Taohong Siwu Decoction, *Angelicae sinensis radix* has the effects of regulating menstruation, nourishing Yin, nourishing liver and nourishing blood; *Chuanxiong rhizoma* can regulate Qi and blood circulation, and has the effects of nourishing Qi and promoting blood circulation; Taoren and Honghua have the effects of promoting blood circulation and removing blood stasis [8]. The combination of these medicines can eliminate blood stasis, promote the generation of new blood, improve blood circulation in the fracture site, and exert therapeutic effects such as promoting qi and relieving pain. In the prescription of Shujin Huoxue Decoction, *Notopterygium rhizoma radix* combined can relieve pain, eliminate dampness, activate collaterals and dispel wind; *Angelicae sinensis radix* combined with Honghua can smooth joints, remove blood stasis and promote blood circulation; *Saposhnikoviae radix* combined with Schizonepetae Herba can relieve muscle spasms, relieve pain and eliminate dampness; *Pericarpium citri reticulatae viride* combined with *Eucommiae cortex* can widen the middle and promote Qi circulation. The combination of these medicines can nourish liver and kidney, relieve joint pain, and strengthen muscles and bones [9]. In the prescription of Zhuangjin Yangxue Decoction, *Paeoniae radix alba* can nourish blood and Yin; *Angelicae sinensis radix* can promote blood circulation and remove blood stasis; *Chuanxiong rhizoma* can nourish blood and benefit blood and remove blood stasis; *Dipsaci radix* can strengthen muscles and bones; *Dioscoreae rhizoma* can nourish Qi and Yin; *Corni fructus*

can nourish liver and kidney; *Atractylodis macrocephalae rhizoma* can nourish Qi and strengthen spleen; *Alismatis rhizoma* can promote urination and eliminate dampness; *Angelicae dahuricae radix* can dispel wind and relieve pain, reduce swelling and drain pus; Poria can nourish spleen and tranquilize mind; *Cyathulae radix* can eliminate blood stasis and regulate menstruation; *Rehmanniae radix* can nourish essence and marrow, nourish Yin and tonify blood; *Moutan* cortex can cool blood and clear heat; *Eucommiae cortex* can strengthen muscles and bones, nourish liver and kidney. The combination of these medicines can strengthen muscles and bones, relieve pain and eliminate blood stasis [10]. After adopting the above-mentioned traditional Chinese medicine dialectical treatment plan, the synergistic mechanism can be utilized to accelerate fracture recovery and effectively restore the joint function of patients.

5. Conclusion

In summary, the combined use of surgery and traditional Chinese medicine three-phase dialectical treatment for IFF patients has a better effect, which can shorten the fracture healing cycle and enhance their joint activity function, with excellent clinical efficacy. However, during the dialectical treatment of traditional Chinese medicine, it is necessary to dynamically observe the patient's fracture recovery and adjust the medication plan in a timely manner to ensure treatment timeliness.

Disclosure statement

The authors declare no conflict of interest.

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