

# Study on Therapeutic Application of Huangqi Combined with Staged Care in Elderly Patients

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## Xiaoxiao *et al.*: Therapeutic Application of Huangqi

To investigate the clinical effects of huangqi Bazhen decoction combined with traditional Chinese medicine staged rehabilitation care on elderly patients undergoing hip arthroplasty. A total of 200 elderly patients who underwent hip arthroplasty in our hospital from January 2020 to December 2021 were selected and divided into routine group (100 patients) and rehabilitation group (100 patients) according to random number table method. Routine nursing was given to patients in the routine group and huangqi decoction combined with traditional Chinese medicine staged rehabilitation care was given to patients in the rehabilitation group, to compare the effects of the application in the two groups. Compared with preoperative values, Harris scores were significantly higher at 4 w and 8 w postoperatively in both groups, and the scores of the rehabilitation group were higher and significantly different from those of the routine group ( $p < 0.05$ ); the rehabilitation group had a higher rate of excellent hip joint than the routine group, and the difference was significant ( $p < 0.05$ ); all the scores on the short form-36 scale in the two groups after intervention were higher than those before intervention and those of the rehabilitation group were higher than those of the routine group, with significant differences ( $p < 0.05$ ); the rehabilitation group had a lower incidence of postoperative complications than the routine group ( $p < 0.05$ ). The combination of huangqi Bazhen decoction and traditional Chinese medicine staged rehabilitation care can promote postoperative hip recovery in elderly patients undergoing hip arthroplasty, reduce the incidence of complications such as postoperative lower extremity deep vein thrombosis and improve the quality of life of patients.

**Key words:** Huangqi Bazhen decoction, hip arthroplasty, vein thrombosis, quality of life, fracture

Fractures are common in the elderly and the joints of the elderly are relatively fragile, which can easily lead to femur fracture and other problems under the action of external forces, causing great pain, affecting their health and normal life, and even disabling<sup>[1]</sup>. The use of conservative treatment measures in elderly patients with femur fractures is unsatisfactory and hip arthroplasty is currently a common and effective procedure for the clinical treatment of this disease<sup>[2]</sup>. It is believed that hip arthroplasty can effectively reduce the disability and mortality rate of elderly patients with femoral fracture, with significant efficacy and also has some advantages for relieving patient distress and accelerating patient rehabilitation<sup>[3]</sup>. However, hip arthroplasty is after all, an invasive treatment modality that causes some trauma to the patient and carries a risk of postoperative complications such as lower extremity deep vein thrombosis that may affect postoperative recovery. As a

scientific approach to nursing care, Traditional Chinese Medicine (TCM) staged rehabilitation care adheres to the concept of three-stage rehabilitation of fractures and different TCM rehabilitation interventions are adopted for patients at different stages, which are able to effectively promote the postoperative rehabilitation of fracture patients<sup>[4]</sup>. Some studies have found that huangqi Bazhen decoction, as a common decoction in TCM, has the effects of invigorating Qi and blood as well as activating blood circulation and eliminating blood stasis and activating collaterals and is able to play a significant role in preventing postoperative lower extremity deep vein thrombosis<sup>[5]</sup>. Therefore, this study attempted to apply huangqi Bazhen decoction combined with TCM staged rehabilitation care in elderly patients undergoing hip arthroplasty and observed its clinical application effect, which is presented as follows.

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## MATERIALS AND METHODS

### General data:

200 elderly patients who underwent hip arthroplasty for femoral fracture at our institution between January 2020 and December 2021 were selected and divided into routine group (n=100) and rehabilitation group (n=100) by random number table method. The general data were not significantly different between the two groups ( $p>0.05$ ) as shown in Table 1.

**TABLE 1: BASE DATA OF THE TWO GROUPS**

Group	Sex (cases)		Age (years)		Fracture site (cases)	
	Male	Female	Span	Mean age	Left	Right
Rehabilitation group (n=100)	56	44	60-79	65.82±3.08	54	46
Routine group (n=100)	58	42	61-77	66.38±3.41	51	49
$\chi^2/t$	0.082		1.219		0.181	
p	0.775		0.224		0.671	

### Inclusion criteria and exclusion criteria:

**Inclusion criteria:** A diagnosis of femur fracture with a clinical diagnosis consistent with the diagnostic criteria for this condition from the "Practice of Surgery"<sup>[6]</sup>; no contraindications to surgery, treated with hip arthroplasty; understood the contents of this study and volunteered to participate.

**Exclusion criteria:** Concurrent malignancy; had undergone surgical treatment for lower extremity fracture in the past; combined with functional diseases in important organs (heart, liver, kidney, etc.); with mental disorders or suffering a psychiatric emergency and not cooperating with this study.

### Methods:

All patients were treated by hip arthroplasty.

**Routine group care pathway:** Preoperatively, caregivers introduce patients and their families with the knowledge of femoral fracture related diseases and focus on elucidating the advantages, precautions, and other applications of hip arthroplasty. Communicate with patients proactively and relieve their bad mood. Postoperatively, enhance monitoring of the patient's condition, promptly notify the physician for management if revealing abnormalities such as blood pressure and heart rate; routine dietary guidance, patients are instructed to keep a light diet and avoid irritating foods; strengthen medication instructions and monitor patients to strictly follow their medication and

patients are instructed to perform functional exercises appropriately based on their postoperative recovery.

**Intervention modes in rehabilitation group:** Huangqi Bazhen decoction combined with TCM staged rehabilitation care. Postoperatively, patients were treated with Huangqi Bazhen decoction with formula; 40 g for Huangqi, 20 g each for *Codonopsis pilosula* and *Caulis spatholobi*, (*C. spatholobi*) and 15 g each for *Poria cocos*, *Glycyrrhiza*, *Panax notoginseng* (*P. notoginseng*), *Ligusticum chuanxiong* hort, *Paeonia lactiflora pallas*, *Rehmannia glutinosa* and *Angelica sinensis* (*A. sinensis*). Take an appropriate amount of clear water to soak the above Chinese medicine, lasting from 20 to 30 min and after decocting for 40 min, the juice is separated from the drug residue, and take the juice before the meal according to 3 times/d, 100 ml/time, from 8 h after surgery. Continue medication for 4 w.

According to the characteristics of patient's postoperative rehabilitation, they were divided into three stages; stage I (1 w-2 w after operation), stage II (3 w-4 w after operation) and stage III (more than 5 w after operation) and aiming at characteristics of different phases, patients were treated with corresponding dietary nursing, emotional nursing as well as rehabilitation training interventions.

### Dietary care:

**Stage I:** In the early postoperative period, patients are mostly accompanied by poor blood and Qi and the diet shall be foods with the efficacy of invigorating blood circulation and stasis, specifically, 1 pigeon is fitted with *P. notoginseng* and *A. sinensis* 10 g respectively for braising, eating the meat and drinking the soup.

**Stage II:** At this stage, it is appropriate to remove stasis and generate new, and it is the important stage of reunion of bone, patients can appropriately eat the livers of animals such as pig liver to help eliminate blood stasis and preferentially consume foods with rich calcium and nutrient such as milk, longan and bone soup as well as Chinese yams. A small amount of vinegar can be added during the bone soup cooking process, so that the calcium in the bone is sufficiently dissolved and the body's calcium absorption can be improved.

**Stage III:** This stage is a critical period for the growth of bony callus and diet should be based on tonic to fully exert the efficacy of invigorating liver and kidney and harmonizing Qi and blood. Patients are instructed to consume many foods such as morula, jujube, black

sesame and walnut kernel, and at the same time, they can drink *C. spatholobi* liquor appropriately on the basis of bone soup, to achieve the purpose of invigorating Qi and blood and accelerating the growth of bone callus in patients.

### Emotional nursing:

**Stage I:** In the early postoperative period, patients have obvious pain sensation, which may easily lead to anxiety, irritability and other negative psychology. Caregivers should strengthen the pain care of patients as much as possible, specifically, massage patient's Hegu acupoints as well as Danyu acupoints, etc., and guide patients to shift their attention and raise their pain threshold and relieve their pain sensation by listening to music and so on; for those with inability to sleep after surgery due to severe postoperative pain, analgesia should be administered with analgesic drugs as prescribed, thus achieving the goal of improving the negative emotions of patients.

**Stage II:** This is a critical phase in the postoperative rehabilitation of patients and caregivers need to further reinforce the psychological counseling of the patient, focusing on introducing them to the successful treatment case of hip arthroplasty, enhancing their confidence. Some elderly patients who are in excellent rehabilitation after hip arthroplasty can be invited to state their opinions and feelings and share the idea of rehabilitation to enable patients to face the disease more positively and optimistically.

**Stage III:** The focus of emotional nursing in the late postoperative phase is to keep patient's adherent to postoperative rehabilitation training and make them fully aware of the important significance of following medical treatment for training. Caregivers should inform patients that continuous, follow-up rehabilitation training is an important prerequisite for improving the outcomes of postoperative rehabilitation, by instilling patients with perseverance, fun and a sense of self-benefit and by doing so; they will self-regulate their emotions during rehabilitation training to ensure the continuation of training and avoid the phenomenon of giving up halfway.

### Rehabilitation training:

**Stage I:** Postoperatively, the patients were guided to perform rehabilitation activities at an early stage, and after the resolution of their anesthesia, they were instructed to perform ankle and toe passive movements correctly, as well as to cooperate with active flexion

extension training and quadriceps long contraction training and so on. 2 d after surgery, joint restorer can be used to help with passive training such as knee and ankle, and the training angle can be adjusted depending on the recovery condition of the patient after surgery. Between 3 d and 10 d postoperatively, the caregivers encourage the patients to gradually initiate active exercises, adhere to the principles of progressive rehabilitation training, and mainly develop supine straight leg raise exercises as well as hip flexor extensor anti-resistance training and so on.

**Stage II:** On the basis of early training, reasonably improving the difficulty of training according to the patient's tolerance, joint restoration training can last until the patient's knee flexion reaches 120°, after which the patient is guided to perform stationary cycling exercises, gradually transitioning from light load training to heavy load training, while cooperating with appropriate resistance extension knee training and so on.

**Stage III:** In this stage, it needs to further strengthen the stability training on the patient's joints, while focusing on muscle strength exercises, and the specific training modes are based on standing and stepping as well as squatting training. The progression of fracture healing in patients was followed by X-ray examination at a later stage, and the decision to initiate weight-bearing training was made based on the examination findings, with weight-bearing walking guided by a light to heavy and stepwise law. According to the fracture recovery status of the patient, it was guided to try life function training such as wearing footwear and promote their postoperative life function recovery. Patients in both groups were under continuous care for 8 w.

### Observational indexes:

**Hip recovered:** The hips were evaluated by Harris hip functional score before, 4 w and 8 w after surgery. The contents cover pain (44 points), deformity (4 points), function (47 points) as well as joint mobility (5 points) for a total of 4 items with a total score of 100 points. Excellent score between 90 and 100 points, good score between 80 and 89 points, general score between 70 and 79 points, poor score less than 70 points; higher Harris score indicates more desirable recovery of hip function. Hip excellent rate=(number of excellent cases+number of good cases)/number of total cases×100 %.

**Quality of life:** Assessed using the health survey Short Form-36 (SF-36)<sup>[7]</sup> before intervention (preoperatively) and after intervention (8 w postoperatively). The scale

contains 4 items; physiological function, physical pain, emotional function and social function, each rated on a 100-point scale, with higher scores indicating better quality of life.

**Complications:** The occurrence of postoperative complications (lower extremity deep vein thrombosis, etc.) was compared between the two groups.

#### Statistical methods:

The statistical analysis tool used in this study was completed by Statistical Package for Social Sciences (SPSS) 25.0, and the count and metrology data in the study were expressed as n (%), ( $\bar{x}\pm s$ ).

The difference was compared through  $\chi^2$  test count data, rank sum test was used for grade data; metrology data were compared within groups using paired t-test and between groups independent samples t-test was employed, and differences that were statistically significant were described by  $p<0.05$ .

## RESULTS AND DISCUSSION

The Harris scores of the two groups were not significantly different from each other before surgery ( $p>0.05$ ) and at 4 w and 8 w after surgery, the Harris scores of both groups were significantly higher than those of the preoperative and rehabilitation group were higher than those of the routine group, with significant differences ( $p<0.05$ ) and compared with the routine group, the rehabilitation group had a significantly higher rate of excellent hips, with a significant difference ( $p<0.05$ ) as shown in Table 2. The comparison of various scores of SF-36 scale between the two groups before intervention was not significant ( $p>0.05$ ); compared with those before intervention, each score of SF-36 scale was higher in both groups after intervention and the score of rehabilitation group was higher than that of routine group with significant difference ( $p<0.05$ ) as shown in Table 3. Compared with the routine group, the rehabilitation group had a significantly lower rate of postoperative complications with significant differences ( $p<0.05$ ) as shown in Table 4.

**TABLE 2: COMPARISON OF THE RECOVERY OF HIPS BETWEEN THE TWO GROUPS**

Group	Harris score			Hip excellent rate				
	Preoperative	4 w after surgery	8 w after surgery	Excellent	Good	General	Poor	Rate of excellence
Rehabilitation group (n=100)	58.20±4.78	68.99±6.21 <sup>a</sup>	75.29±8.37 <sup>ab</sup>	45 (48.00)	43 (43.00)	7 (7.00)	5 (5.00)	88 (88.00)
Routine group (n=100)	57.89±5.02	62.14±5.73 <sup>a</sup>	70.48±7.85 <sup>ab</sup>	30 (30.00)	44 (44.00)	16 (16.00)	10 (10.00)	74 (74.00)
t/Z/ $\chi^2$	0.447	8.11	4.19			8.2		6.368
p	0.655	0	0			0.042		0.012

Note: <sup>a</sup> $p<0.05$  compared with our group preoperatively and <sup>b</sup> $p<0.05$  compared with our group 4 w postoperatively

**TABLE 3: SF-36 SCORE CHANGES IN THE TWO GROUPS [POINTS, ( $\bar{x}\pm s$ )]**

Group	Physiological function		Physical pain		Emotional function		Social function	
	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Rehabilitation group (n=100)	68.65±4.22	76.25±5.64 <sup>a</sup>	67.33±3.98	78.62±6.16 <sup>a</sup>	66.47±5.39	72.65±5.63 <sup>a</sup>	70.82±6.39	75.63±6.81 <sup>a</sup>
Routine group (n=100)	69.32±5.03	73.62±5.26 <sup>a</sup>	68.09±4.28	72.45±5.47 <sup>a</sup>	67.05±4.83	69.72±5.03 <sup>a</sup>	71.04±5.08	73.62±5.47 <sup>a</sup>
t	1.02	3.41	1.3	7.49	0.801	3.881	0.27	2.301
p	0.309	<0.001	0.195	<0.001	0.424	<0.001	0.788	0.022

Note: <sup>a</sup> $p<0.05$  vs. before intervention in this group

**TABLE 4: POSTOPERATIVE COMPLICATIONS IN THE TWO GROUPS [n (%)]**

Group	Infections	Lower extremity deep vein thrombosis	Hip dislocation	Constipation	Total incidence
Rehabilitation group (n=100)	0 (0.00)	1 (0.00)	0 (0.00)	1 (0.00)	2 (2.00)
Routine group (n=100)	1 (0.00)	8 (0.00)	1 (0.00)	1 (0.00)	11 (11.00)
$\chi^2$			6.664		
P			0.01		

Femur fractures are a common type of fracture in the elderly and the etiology mainly includes external force hitting, high fall injury, and traffic accidents<sup>[8,9]</sup>. Hip arthroplasty is an effective means of clinical treatment of femur fracture and its efficacy is relatively precise, but there is a risk of postoperative lower extremity deep vein thrombosis and other complications, and it is necessary to cooperate with corresponding postoperative care measures, so as to promote its postoperative rehabilitation<sup>[10,11]</sup>. Previous clinical treatment for elderly patients undergoing hip arthroplasty with femoral fracture takes the way of routine nursing mostly, the nursing measures used were relatively single, the nursing content was not abundant enough, and they failed to differ according to the rehabilitation characteristics of patients at different stages of postoperative care, nursing care was not very specific, and the nursing effect was not ideal. In recent years, the application of TCM interventions in elderly patients undergoing hip arthroplasty has also become more widespread and has achieved certain success<sup>[12]</sup>. There is a certain feasibility of applying TCM intervention modalities in elderly patients undergoing hip arthroplasty.

This study found that the rehabilitation group received the combined TCM staged nursing intervention of Huangqi Bazhen decoction and their hip function improved significantly, their quality of life improved significantly, and their postoperative complication rates were lower than those of the routine nursing group, especially the incidence of postoperative lower extremity deep vein thrombosis was significantly lower, which was basically consistent with the findings of Xiangmei *et al.*<sup>[13]</sup>. In this study, the TCM staged care divided the postoperative rehabilitation of fracture patients into three different stages and suitable nursing interventions were adopted for the rehabilitation characteristics of each stage, which fully reflected the principles of fracture treatment and care of TCM “removing

stasis, generating new and integrating bone”, and conformed to the laws and physiological characteristics of postoperative rehabilitation of fracture patients. TCM holds that blood circulation and stasis should be mainly eliminated at the initial stage of postoperative rehabilitation in patients with bone fracture, while continuous tendons with bone are practiced at the middle stage and strong fasciae are focused at the later stage<sup>[14]</sup>. In this study, Huangqi Bazhen decoction, which possesses the effect of invigorating blood circulation and eliminating stasis and activating collaterals, can exert the efficacy of invigorating Qi and blood, and is beneficial for promoting the postoperative recovery of elderly patients undergoing hip arthroplasty. TCM has historically focused on medicine and food homology, and in the TCM staged care, according to the characteristics of different stages of patients, stage-by-stage dietary guidance and care, early consumption of Pigeon *P. notoginseng* decoction, etc., may play the role of invigorating blood circulation and eliminating stasis, helping to relieve patient pain, and promoting its hematoma absorption; the medium-term consumption of animal liver and bone decoction, among others, may help to eliminate stasis and generate new, strengthen calcium supplements and help connect continuous tendons in bone; at the later stage, tonic diet is emphasized, and appropriate drinking of *C. spatholobi* liquor and so on can help to invigorate Qi and blood and achieve the coordination of Qi and blood, thus promoting the rapid growth of bone callus and favoring the postoperative healing of fractures. TCM staged care advocates the use of differential emotional nursing means according to the emotional characteristics of patients at different stages after surgery, focusing on relieving patient’s pain in the early postoperative period, and avoiding aggravation of patient’s negative emotions due to pain; further strengthening of psychological counseling in the middle stage improved patient treatment confidence; for emotional care of the

later stage, it focuses on guiding patients to adhere to the completion of postoperative rehabilitation training, instilling the notion of perseverance and fun to enable patients to cooperate with rehabilitation training activities throughout the whole process to improve postoperative rehabilitation outcomes. Rehabilitation training is a key link in the postoperative rehabilitation of patients undergoing hip arthroplasty and strengthening is necessary and important to guide postoperative rehabilitation training of patients<sup>[15]</sup>. According to the characteristics of patient's postoperative stage I, stage II and stage III rehabilitation, TCM staged care guided them to perform the corresponding rehabilitation training activities, always adhered to the principle of gradual rehabilitation training, which can ensure the safety of rehabilitation training and maximize the effect of rehabilitation training. Lower extremity deep vein thrombosis is one of the most common complications after hip arthroplasty in elderly patients, and TCM has included it in the category of "stasis", which is believed to be due to numerous blood spills of veins after hip fracture surgery, resulting in stasis blockade and affecting the operation of Qi and blood. Huangqi (Radix Astragali) is the main TCM component in Huangqi Bazhen decoction, which is characterized by warm in nature and sweet in taste and possesses itself the efficacy of invigorating Qi for strengthening superficialities as well as invigorating qi and invigorating blood flow, cooperating with *P. notoginseng* and *Salvia miltiorrhiza*, as well as *C. spatholobi*, it can achieve the purpose of eliminating swelling and relieving blood stasis, harmonizing Chinese medicine and can collectively achieve the efficacy of invigorating Qi and blood flow and invigorating blood circulation. Huangqi Bazhen decoction has obvious effects on improving microcirculation of patients, while it can also dilate the blood vessels of patients, resulting in the reduction of their blood viscosity and effective prevention of postoperative lower extremity deep vein thrombosis.

In conclusion, the simultaneous application of Huangqi Bazhen decoction and TCM staged rehabilitation care to elderly patients undergoing hip arthroplasty is beneficial for promoting the recovery of hips in patients after surgery, which may be beneficial for reducing postoperative complications and improving the quality of life of patients.

#### Conflict of interests:

The authors declared no conflict of interests.

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