

Clinical value of Chinese and western medicine for the treatment of early-stage avascular necrosis of the femoral head

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Abstract

Background: Informally known as femoral or pelvic head necrosis, avascular necrosis is a disease in which the bone disintegrates due to a disruption in blood supply to the head of the femur bone. It results in the loss of strength and hardness of the bone, which cannot maintain the bodyweight and eventually becomes deformed.

Objective: This study aims to identify Traditional Chinese Medicine's (TCM) therapeutic effect and its interventional therapy for the early-stage treatment of avascular necrosis of the femoral head.

Methods: According to the Fiat system, 19 hips in 97 cases. There is 0 hip at stage 0; 8 at phase I; 11 at stage II, which were divided into three groups randomly, namely Group A, B and C. Group A was treated by Chinese medicine; group B was treated by interventional therapy while group C interventional therapy is followed by Chinese medicine. CT and Angiography were done before and after treatment.

Results: patients were researched within 1 to 3 years of follow-up after treatment. In group C, Angiography and clinical rate shows an increase in vessel count, which is higher than in group A and group B ($P < 0.01$).

Conclusions: Interventional therapy followed by Chinese medicine is the preferred choice to treat early-stage avascular necrosis of the femoral head. [*Ethiop. J. Health Dev.* 2021; 35(3): 258-263]

Keywords: femoral head necrosis; a combination of TCM and western medicine; interventional radiology.

Introduction

Avascular necrosis of the femoral head (avascular necrosis of femoral head, ANFH for short) is a typical refractory disease in orthopedic clinics [1, 2]. The medical name is "Bone Bi," "Bone Erosion," or "Bone Disorder" [3]. There are currently many treatment methods, such as promoting blood circulation and removing blood stasis in Chinese medicine, bone transplantation in western medicine, replacing the femoral head, and so on, but all do not achieve satisfactory results. TCM symptoms improve slowly, however in order to be cured, the treatment time is lengthy; the survival rate of western medicine bone transplantation is low. The operation is complex; the femoral head replacement is restricted by age and expense—interventional treatment of femoral head damage has emerged in recent years. The emergence of new technologies for death has made a breakthrough in the treatment of this disease [4-6]; Traditional Chinese Medicine and Interventional Therapy in Wafangdian City Hospital was a bureau-level project in 2003, and the curative effect achieved satisfactory results and improved the life of patients with femoral head necrosis.

Material methods

From July 2016 to March 2020 in Dalian City Integrated Traditional Chinese and Western Medicine hospitals and Wafangdian City Hospital of Traditional Chinese Medicine, inpatients for interventional treatment and who met the diagnostic criteria, were

enrolled in a Quasi experimental design consisting of; [7] 96 cases of 117 (hip) aseptic damage of femoral head caused by various reasons, randomly divided into three groups A, B, and C, group A was Chinese medicine method, group B was Incoming intermediary therapy, group C is traditional Chinese medicine + interventional treatment. Seventy-five males and 21 females; The age was 19 to 72 years old, the average age was 43.8 years old, and the disease course was 0.5 to 7 years.

According to Fiat [8] staging, there were 38 hips in stage I and 79 hips in stage II. Due to stages III and IV, those who belong to the middle and late periods are not listed. The number of treatments is 1 to 7 times, with an average of 3 times.

The interval time is two weeks to 2 years per hip. Twenty-one cases of trauma history, 13 instances of history of hormone application, 37 cases of heavy drinkers, 18 instances of divers, 7 other physical issues have been recorded. All medical records were diagnosed as a femoral head defect by clinical, CT, or ECT Blood necrosis.

Treatment method

96 patients were randomly divided into three groups, each with 32 cases. Group A: using traditional Chinese medicine alone, oral Wenjing Tongmai Decoction, medicine, which consists of 9 g of Chuanwu, 6 g of Caowu, 24 g of Rehmanniaglutinosa, 12 g of Chinese

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angelica, Chuanxiong 15 g, Red Peony 15 g, Eucommia 30 g, Dipsacus 30 g, Achyranthesbidentata 30 g, 15 g peach kernels, 10 g safflower, 6 g licorice, fry 300 ml, were served in the morning and evening. One dose per day, 20 days as a course of treatment, three courses in total, between courses the interval was 10 days. Clinical addition and subtraction: add scorpion and centipede for severe pain to relieve the collateral Pain, excessive dampness, muddy limb weight plus atractylodes, living alone, weakness of qi, and deficiency of limbs Add Astragalus and Codonopsis.

Group B: Interventional therapy group, routine oral Persantine 3 days before operation 25 mg, aspirin 0.3 mg, calcium gluconate 0.5 mg, vitamin AD1 capsule, three times/d each, 500 ml of low-molecular-weight dextran, yellow Qi 10 ml, compound Danshen 20 ml. Seldinger's puncture technique was used during the operation. The catheter was punctured through the femoral artery, and the tip of the catheter was placed in the obturator on the affected side. Artery, internal femoral circumflex artery, external femoral circumflex artery, UVIX contrast medium 5ml Perform Angiography and digital subtraction. And then, in each blood vessel, ligustrazine hydrochloride injection 80mg was injected, urokinase 150,000 units, poppy base 10 mg, low molecular weight dextran 80 ml. 20 d Interventional therapy was administered once, a total of three treatments were administered overall. antibiotics were used for three days after surgery, and patients continued to use preoperatively after taking medicine for one week; calcium and AD capsules were taken orally. Note that within 24 hours after surgery, strict limitation of the affected limb's movement to avoid local bleeding and hematoma. Patients can have non-weight-bearing flexion, extension, and rotation exercises on the bed to promote blood circulation, and to prevent/ stop muscle atrophy and osteoporosis from facilitating functional recovery and encourage the curative effect. After 72 hours, the affected limb can be exercised with crutches. But it is forbidden to use

abduction and weight-bearing walking in order to avoid femoral head collapse, thereby affecting the efficacy.

Group C: Interventional therapy and TCM group, patients in this group are undergoing interventional treatment, traditional Chinese medicine is added to the treatment regime, medicine composition, and prescription on the third day after each operation.

The method is the same as Group A. The efficacy evaluation adopts the "82 Beijing Standard" revised in 1994 [10]; the standard is 100 points, and the clinical examination results are four items: pain, life energy strength, joint mobility, and walking distance. Six points for each item, level 1 is the worst; level 6 is the more worst. This study determined that one year is the short-term curative effect, and 1 to 2 years is the mid-term treatment. Effective, more than three years is the long-term effect; this article only discusses the long-term impact.

Imaging examination

The three groups of patients underwent CT examination before and after treatment to observe the necrosis bone changes in the bones. 96 patients (32 in group A, 32 in group B cases, 32 cases in group C) before and after treatment, obturator, internal femoral, and external arterial cannulation were performed for Angiography and to count blood vessels according to the set diameter.

Statistical methods

All data was analysed using SPSS 10.0 statistical software, which performs data analysis and processing. The study between groups adopts the t-test and counts the capital, and the material uses the χ^2 test. $P < 0.05$ is statistically significant.

Results

For clinical symptoms and function evaluation, see Tables 1, 2, and 3.

Table 1 Group A: Comparison before and after treatment with traditional Chinese medicine alone ($\bar{x} \pm s$)

	I. Period(12 hips).		II. Period(27 hips).	
	Before treatment	After treatment	Before treatment	After treatment
Pain	32.00 \pm 4.13	36.50 \pm 6.51 *	28.00 \pm 4.98	30.7 \pm 10.18 *
The ability to live	19.69 \pm 2.87*	22.19 \pm 5.15	18.44 \pm 2.35	20.31 \pm 6.08*
Activity	19.50 \pm 1.37	19.50 \pm 2.00	16.38 \pm 2.76	17.50 \pm 4.28*
Walking distance	14.63 \pm 1.02	14.63 \pm 1.50	11.91 \pm 1.61	13.03 \pm 3.29*

Note: Comparison before and after treatment, * $P < 0.05$

Table 2 Group B: Comparison before and after intervention ($\bar{x} \pm s$)

	I. Period(15 hips)		II. Period(24 hips)	
	Before treatment	After treatment	Before treatment	After treatment
Pain	32.00 \pm 4.28	37.09 \pm 5.81*	28.16 \pm 4.64	33.44 \pm 8.50*
The ability to live	20.00 \pm 3.08*	22.73 \pm 4.00	18.40 \pm 2.36	22.90 \pm 3.05*
Activity	19.45 \pm 1.41	19.64 \pm 1.71	16.40 \pm 2.46	18.72 \pm 2.73
Walking distance	14.59 \pm 1.05	14.73 \pm 1.28	11.88 \pm 1.48	14.04 \pm 1.54*

Note: Comparison before and after treatment, * $P < 0.05$

Table 3. Comparison before and after TCM + interventional treatment (--x ±s)

	before treatment	After treatment	Before treatment	After treatment
Pain	32.00 ±4.35	36.86 ±4.54*	28.07 ±4.78	34.44 ±7.89*
The ability to live	20.18 ±3.19	23.04 ±3.14*	18.39 ±2.36	22.88 ±3.11*
Activity	19.43 ±1.43	19.86 ±0.76	16.34 ±2.38	19.05 ±2.14*
Walking distance	14.57 ±1.07	14.89 ±0.57	11.79 ±1.46	14.19 ±1.46*

Note: Comparison before and after treatment, *P <0.05

Table 4. CT review results after three groups of treatment

Groups	The number of hips	Significant fix	Partial repair	No fixes	Increase	Repair rate
Group A	39	6	16	13	4	56.4
Group B	39	12	20	5	2	75.2
Group C	39	14	23	2	0	77.6

Note: Comparison before and after treatment, *P <0.05

Table 5. Analysis of angiographic counts after three groups of treatments (- x ±s)

Group	The number of hips	Before treatment	Treatment After	P-value
A Group	39	6.15 ±0.23	8.76 ±0.41	<0.05
B Group	39	6.03 ±0.54	10.17 ±0.53	<0.05
C Group	39	6.47 ±0.71	12.73 ±0.42	<0.05

Imaging changes

CT changes: Three groups of patients with avascular necrosis of the femoral head were treated for the density of the posterior femoral head, which increased to varying degrees, and the cystic area also increased to varying degrees after the treatment of the three groups of A, B, and C, the cystic degeneration area was reduced by more than 30% those who accounted for 56.4%, 61.8%, 78.2% respectively, the three groups of treatment methods all have curative effects, with group C being the best (table 4).

Angiography: After statistical processing, the blood vessels on the above three line counts are listed in the table. Before and after treatment, the three-line blood vessel count showed that all patients had more blood after treatment than before. The tube count increased, and there was a significant difference by t-test (P <0.05), treatment of the blood supply of the posterior femoral head improved (see Table 5). Based on the comparison of the results among the three groups and through observation of the table, no significant difference was found between the treatment results of group A and group B (P >0.05). The comparison results between group A and group C, group B, and Group C shows the test was significantly different (P <0.05).

Discussion

The cause of the femoral head's aseptic necrosis is complicated, and Chinese medicine considers the fundamental pathogenesis [11, 12]. It lies in "Qi stagnation and blood stasis, resulting in arthralgia due to blood stasis [13]." Western medicine is generally divided into two categories: traumatic and non-traumatic [14]. The former is a share Ischemia caused by a sudden blockage of internal and external arteries [15]; non-traumatic causes, Miscellaneous factors are: (1) after hormone therapy; (2) alcoholism; (3) diving reduction Compression disease; (4) Sickle cell anemia; (5) Lipid hyperplasia; (6) Radiation-Irradiation; (7)

Arterial disease; (8) Others such as abnormal blood clotting, connective tissue disease—change, bone marrow infiltrating disease, infection, and allergy, etc. The main risk factor is hormones and alcoholism, but the pathogenesis is not entirely understood [16]. The prominent role of vascular endothelial damage and intravascular coagulation in the pathological process of femoral head necrosis has received increasing attention, which is consistent with the "stasis of blood" Chinese medicine theory [17-19].

The theory of "blood" has similarities. This is the principle of treating the disease by combining Chinese and Western medicine [20-21]. Regardless of the cause, this disease's typical pathological changes are local blood supply disorders, which leads to ischemia of the femoral head and causes aseptic bone damage [22]. The changes in blood vessels include interruption, reduction, and narrowing of blood supply arteries and veins. The evolution of the venous factor in thrombosis or veins become thin and more petite, and causes restricted blood flow t. The pressure increases, which leads to the destruction of articular cartilage, and a loss in joint function which can lead to , disability [23]. Necrosis of the femoral head belongs to the category of osteoarthritis in Chinese medicine [24]. Its pathogenesis is linked to insufficiency of the kidney qi, empty marrow meridian; or after trauma, the invasion of wind, cold and dampness, paralysis obstructing the blood vessels, qi, blood stasis, bone marrow disorders, ischemic necrosis [25]. Fang Zhong Zhi Chuan Wu, Cao Wu Wenjing, dispels cold, eliminates dampness, and relieves pain; Dipsacus, Eucommia, Huanianu [26]. The knees nourish the kidney and strengthen the yang, and it also adds essence and nourishment to the marrow; Redi, Angelica, Red peony tonic blood; Peach kernel, safflower promotes blood circulation and removes stasis, and the whole prescription plays warming meridians thus dispelling cold, invigorating kidney and strengthening yang, and promoting blood circulation, thus promoting the effect of silt [27-29].

Proved by years of clinical data and group A data of this study, Chinese medicine has benefits for the treatment of avascular necrosis of the femoral head.

The cure rate in this group reached 66.8%. The blood supply of the femoral head of ordinary people is mainly in the internal and external circumflex of the deep femoral artery. Blood is supplied by arteries and obturator arteries. The principle of interventional treatment is to guide the catheter to the desired blood artery, directly dose of thrombolytic drugs, vasodilators, and blood circulation improvement drugs are injected into the stock in the arteries that supply blood to bones, improve the blood supply of the affected limb and increase collateral circulation and dredge the nutrient blood vessels of the femoral head. Ligustrazine Hydrochloride, Synovial muscle, and anti-platelet aggregation, prevent thrombosis, promote vascular endothelial cells and vascular proliferation [30]; Urokinase can directly activate plasminogen and degrade fibrinogen [31]; Papaverine has antispasmodic and vasodilator effects; which lower molecular weight [32-34], dextran can increase blood volume, reduce blood viscosity and red blood cells and the role of aggregation rate [35]. Infuse the femoral head as mentioned above, as Chinese and Western medicines are beneficial for blood arteries, they promote blood circulation, remove blood stasis, remove blood stasis and regenerate, improve local blood supply and increase Collateral circulation improves the ischemic state, reduces intraosseous pressure to reduce or eliminate pain. It also promotes the absorption of dead bones. It speeds up the repair process. The occluded blood vessels are opened, release of the the damaged blood vessels and collateral circulation are established, and the blood supply to the femoral head is restored.

Patients experienced recovery, nutritional improvement, and then bone tissue regeneration, after interventional treatment, the patient's pain symptoms disappeared or were significantly reduced. The patients all had different degrees of recovery, proving that interventional treatment can improve the femoral head. The blood supply is directly and indirectly regulated at the level of complex high-level molecules. Improved microvascular proliferation in the necrotic area promotes increased blood supply around the cell, providing rich nutrients which, Activates bone cell metabolism and accelerate new bone shape to complete, the necrotic area which gradually shrinks and disappears, and the bone trabeculae are reconstructed. After an operation, XLines, CT, MRI film follow-up, and observation of necrotic bone all showed varying degrees of Repair. In group B's data in this study, we measured and compared the blood vessel count before and after the treatment. Both increased ($P < 0.05$).

This study shows that whether it is traditional Chinese medicine or interventional therapy, femoral head necrosis has a better curative effect. Still, the combination has a better outcome. Group C has the highest clinical cure rate. Increased blood vessel counts Group C and Group A and Group B compared with a significant difference. Digital subtraction shows the

internal and external femoral circumflex arteries thickened and increased, and the upper and lower branches of the head increased significantly, with 60% extending to the skin under. Therefore, early interventional therapy with integrated traditional Chinese and western medicine is the first choice for patients' to improve the blood circulation disorder of the femoral head and improve the quality of life of the patient. The "holistic concept" is the essence of Chinese medicine. Interventional radiology focuses on the local area; combining the two and integrating them can enable Chinese medicine to focus on the external reflection of physiology and pathology. Combined with pathological diagnosis, interventional radiology that focuses on etiology helps doctors understand the condition better.

Comprehensive and systematic understanding reflects a thorough knowledge of the cause, pathogenesis, disease location, and the nature of the disease and the integration concept. Therefore, Chinese medicine and local treatment interventions are combined.

Conclusion

Together, many new treatment strategies will emerge to complete the treatment system. On the other hand, according to the author, combining interventional therapy and traditional Chinese medicine is a high-level integration. With the continuous enrichment of knowledge in Chinese medicine, it is believed that the combination of Chinese and Western medicine will be one of the most acceptable ways to complete the treatment procedure, for other conditions including femoral head necrosis. The new course of economical and effective treatment will also promote the reform of TCM formulations. An indispensable part of the medical modernization process will surely accelerate Chinese medicine. research technological advancements, new equipment, new dosage forms, and new patients makes it possible to develop Efficient and specific therapeutic drugs to make Chinese medicine go abroad faster.

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