

A Brief Analysis of the Experience of Treating Avascular Necrosis of the Femoral Head Based on the Theory of "Tonifying the Kidney and Promoting Blood Circulation" by Professor Shen Fengjun, a Renowned Traditional Chinese Medicine Doctor Specializing in Bone Injuries Nationwide

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Abstract: *In terms of Traditional Chinese Medicine, avascular necrosis of the femoral head falls under the categories of "bone erosion" and "bone atrophy." Professor Shen Fengjun believes that the pathogenesis of avascular necrosis of the femoral head is characterized by deficiency in the root and excess in the branches, with the coexistence of "deficiency and stasis." "Kidney deficiency" and "blood stasis" run through the entire disease process, forming the core of the disease's pathogenesis. Therefore, in the treatment process, methods such as promoting blood circulation to remove stasis, unblocking the channels to alleviate pain, strengthening the spleen to resolve phlegm, and nourishing the kidneys to strengthen the bones should be used to prevent the accumulation of phlegm and the generation of stasis. Professor Shen Fengjun adopts individualized treatment for the different accompanying symptoms of avascular necrosis of the femoral head, which plays a positive role in improving the range of motion of the affected side, alleviating patients' pain, slowing the progression of the disease, and thus improving the patients' quality of life.*

Keywords: Avascular necrosis of the femoral head, Promoting blood circulation to remove blood stasis, Tonifying kidney and strengthening bones.

1. Introduction

Avascular necrosis of the femoral head (ONFH) is one of the common and difficult-to-treat diseases in orthopedics. The main characteristics of the early clinical symptoms are hip pain and limited hip joint movement, which severely affect the quality of life of patients. Due to the insidious nature of the disease in its early stages and the lack of typical symptoms, ONFH is usually at an advanced stage when discovered. Early diagnosis mainly relies on MRI and CT scans [1]. Therefore, ONFH has now become one of the main causes of disability in young and middle-aged people [2]. The etiology of ONFH is not yet clear [3]. Western medicine mainly adopts surgical and non-surgical treatments for ONFH. Surgical treatments include joint replacement, core decompression, interventional treatment, etc. Surgical treatments have better short-term effects, but they are invasive and expensive, so they cannot be the preferred treatment for patients with early tointerim ONFH. Non-surgical treatments mainly target early tointerim patients, promoting bone formation and repairing necrotic bone by improving the blood circulation around the femoral head and femoral neck. However, the overall therapeutic effect is limited [4]. In the history of ONFH treatment, the ancient Chinese people have rich experience in using herbal medicine for internal and external use to treat ONFH, summarizing many effective treatment plans. The most widely used is the "three stages and four types" treatment plan, which divides ONFH into "early, middle, late" "three stages" and "qi stagnation and blood stasis, phlegm and blood stasis blocking the channels, meridian obstruction, liver and kidney

deficiency" "four types" [5]. Professor Shen Fengjun summarized the "three stages and four types" and proposed the "tonifying kidney and activating blood method" for the treatment of early tointerim ONFH, fully utilizing the characteristics and advantages of traditional Chinese medicine, which has been widely used in clinical treatment and has achieved significant therapeutic effects.

2. Etiology and Pathogenesis

2.1 In traditional Chinese medicine, ONFH falls under the categories of "bone erosion" and "bone atrophy." The main pathogenesis of ONFH is kidney deficiency and marrow damage, indicating a deficiency of the body's vital energy, including yin and yang, qi and blood, body fluids, and essence. The "Su Wen: Discussion on Atrophy" states, "When kidney qi is hot, the lower back cannot be lifted, the bones dry up and the marrow diminishes, leading to bone atrophy." The "Su Wen: On the Ancient and True" says, "When liver qi declines, the tendons cannot move." The "Ling Shu: visiting pathogen" mentions, "When the spleen has pathogenic influences, its qi lingers in the two hips... where the blood network wanders." The "Ling Shu: On the Formation of Qi and Blood" records, "In the elderly, qi and blood weaken, their muscles wither, the qi pathways become sluggish, and the qi of the five viscera fight each other." ONFH occurs because the sinews, vessels, and bones cannot be nourished, leading to local joint swelling and pain, limited flexion and extension. As the disease progresses, symptoms gradually worsen. In the later stages, severe cases may experience muscle atrophy, joint stiffness

and deformity, limb shortening, and other clinical manifestations. Thus, traditional medicine has long studied ONFH. The occurrence of ONFH is due to a deficiency of the liver and kidneys, a deficiency of both qi and blood, which then produces phlegm, dampness, and blood stasis, blocking the channels and collaterals. Ultimately, this leads to qi stagnation and blood stasis, and a deficiency of qi and blood, causing the femoral head to die from lack of blood nourishment. The onset of femoral head necrosis includes both internal and external causes, and its occurrence is the result of the interaction and mutual influence of both. The root cause is the dysfunction of the five viscera and six bowels, with qi and blood imbalance as the symptoms. The viscera and qi and blood imbalance are mutually causal. When the correct qi is present within, evil cannot interfere. A deficiency of correct qi leads to an imbalance of qi and blood, and a lack of external defense, causing the qi and defense to be out of balance, then evil will inevitably invade, leading to an imbalance of yin and yang, and an imbalance of qi and blood. The kidneys govern the bones, and the liver governs the tendons. A deficiency of the liver and kidneys, leading to a lack of nourishment for the tendons and bones, is an important internal cause of the disease. When external pathogens invade the body, they produce a large amount of phlegm, blood stasis, and dampness, causing local qi and blood stagnation, blocked channels and collaterals, and a lack of nourishment for the femoral head, which also becomes an important reason for the occurrence of ONFH. Therefore, in treatment, it is important to both tonify the kidneys and strengthen the bones and to promote blood circulation and remove blood stasis. Analyzing the causes from the perspective of the five viscera, the occurrence of ONFH is closely related to the kidneys, liver, and spleen. The "Su Wen: Great Theory of Yin and Yang" points out, "The kidneys generate bone marrow." The marrow is stored within the bone cavities to nourish the bones, hence "when the kidneys are full, the marrow is substantial." The liver stores blood, governs dispersion, and shares the same source with the kidneys. When the liver is diseased, the circulation of qi and blood becomes sluggish, and the bones, due to lack of blood, can develop necrosis. The spleen governs transformation and transportation and is known as the "source of postnatal qi and blood." Therefore, it is called the "root of the postnatal." A disease of the spleen can affect other organs, and a deficiency of spleen qi can lead to deficiencies in the other four viscera, causing a lack of nourishment for the bone marrow and subsequent disease [7].

3. ONFH Differential Diagnosis and Treatment

3.1 From the perspective of Traditional Chinese Medicine, the "Suwen: Chapter on the Visceral Manifestations of the Six Divisions" states that "the kidney is responsible for the filling of the bones," and the "Lingshu: Chapter on the Meridians" further explains that "when the Qi of the foot Shaoyin meridian is exhausted, the bones will wither." Therefore, the etiology and pathogenesis of avascular necrosis of the femoral head are primarily attributed to the deficiency of the kidney, and thus it is necessary to tonify the kidney and consolidate the root, and enrich the essence and marrow. Professor Shen Fengjun, integrating the characteristics of avascular necrosis of the femoral head, points out that the deficiency in the pathogenesis should be closely related to the deficiency of the spleen, liver, and kidney. The spleen governs transportation

and transformation, and is associated with muscles and the limbs. It transforms the essence of food and water, which is then transported to the lungs, infused into the heart's vessels, and distributed throughout the body to nourish the five viscera and six bowels, as well as the limbs, muscles, joints, and bones, ensuring strong tendons and bones, and robust muscles. The liver governs the tendons and stores blood. "The kidney is the foundation of congenital essence and governs the bones and the production of marrow." When the kidney Qi is abundant, the sea of marrow is nourished, and the bones are strong [8]. From his many years of clinical experience, Professor Shen Fengjun has concluded that the treatment of ONFH should involve the method of tonifying the kidney and activating blood circulation. He has developed the modified Danxian Huogu Decoction, with *Salvia miltiorrhiza* as the sovereign herb, which has a bitter taste and slightly cold nature, is good at activating blood circulation and generating new blood, dispelling stasis and relieving pain, and has the same effect as the Siwu Decoction, making the vessels flourish and thus painless, and unobstructed and thus painless. The assistant herbs include *Angelica sinensis*, Peach Kernel, Safflower, Red Peony, and *Curcuma zedoaria* to assist *Salvia miltiorrhiza* in its function of activating blood circulation and dispelling stasis. The adjuvant herbs include *Drynaria*, Teasel Root, and *Epimedium* to nourish the kidney and strengthen the bones. Since the liver stores blood, *Chuanxiong* is used as the guide herb to lead the formula into the liver channel. The entire formula works together to activate blood circulation, dispel stasis, nourish the kidney, and strengthen the bones.

3.2 From the theory of "stagnation treatment" in "Spiritual Pivot - Questions and Answers," it is said: "All diseases begin with the influences of wind, rain, cold, heat, yin and yang, joy and anger, diet, living conditions, great shocks, sudden fears, which cause the separation of blood and qi, the destruction of yin and yang, the collapse of meridians and collaterals, the blockage of the pulse paths, the inversion of yin and yang, the stagnation of the defensive qi, the emptiness of the meridians, the disorder of blood and qi, and thus the loss of their normal functions." Under the influence of external pathogens, internal injuries, diet, lifestyle, and the seven emotions, "stagnation" accumulates within the body, leading to complex conditions, varied symptoms, and the entanglement of other pathologies. It can be accompanied by "qi stagnation" or mixed with "phlegm," and over time, it results in "deficiency [9]." Professor Shen Fengjun, based on years of clinical diagnosis and observation, believes that "blood stasis syndrome" runs through the entire process of ONFH. On one hand, blood stasis is a pathological outcome formed under the action of certain pathogenic factors, leading to poor blood circulation and stagnation in a local area. This pathological condition, if it persists, will further cause new syndromes of blood stasis syndrome, that is, the pathological process caused by the obstruction of blood vessels and the disturbance of blood flow. The main symptoms of ONFH are hip pain, especially in the groin area, limited joint movement, and limping. For syndromes diagnosed as blood stasis obstruction, the treatment should focus on promoting blood circulation and removing blood stasis, eliminating pathological products, promoting blood vessel regeneration, restoring blood supply, facilitating the absorption of dead bone, and the formation of new bone. Professor Shen Fengjun is adept at using herbs such as Safflower (*Carthamus tinctorius*) and Safflower

(*Carthamus tinctorius*) for promoting blood circulation and removing blood stasis. Safflower is bitter and sweet in taste, with a neutral nature, and is particularly good at promoting blood circulation and removing stasis, moistening dryness and lubricating the intestines, and gently relieving stagnation. Its effect of moistening dryness and promoting bowel movement can also provide a pathway for the stagnation inside to be expelled. When Safflower is used in combination with Safflower, Safflower is spicy in taste and can both ascend and descend, only entering the blood aspect, and is particularly good at breaking blood, having the effects of promoting blood circulation, unblocking channels, reducing 3 Swelling, and relieving pain.

4. Case Study Examples

Mr. Liang, male, 27 years old.

Initial diagnosis: June 18, 2023, medical history: 3 months ago, the patient experienced pain in the left hip, mild limping, which worsened after long-distance walking and was somewhat relieved by rest. Pain increased with cold weather and changes in the weather. There was a history of excessive alcohol consumption. An MRI from an external hospital indicated avascular necrosis of the left femoral head. On examination, pain in the left hip was evident, especially in the groin area, with pain radiating to the knee joint on the front and outer side of the left thigh. Squatting was limited. There was no significant atrophy of the quadriceps femoris on both sides. The left leg standing test (-), lateral impact pain on the greater trochanter of the left side (+), pain on pressure at the midpoint of the left groin (+), left 4-word test (+), flexion adduction, internal rotation test (+), flexion abduction, external rotation test (+), hyperflexion test (+), no pain on pressure at the lumbar spine and sacroiliac joints (-). The right hip joint had unrestricted flexion and extension activities. Muscle strength of both lower limbs was grade 5, with no significant abnormalities in blood supply and sensation. Physiological reflexes were present, pathological reflexes were not elicited. The visual analog scale (VAS) score for both hip joints was 5 for the left and 0 for the right. Auxiliary examinations: X-rays showed no collapse of the femoral head, left hip MRI indicated avascular necrosis of the left femoral head (no crescent sign), left hip CT showed no significant bone destruction, and other auxiliary examinations showed no significant abnormalities. Admission symptoms included pain in the left hip with limited activity of the left hip joint, mild limping, which worsened after long-distance walking and was somewhat relieved by rest. Pain increased with cold weather and changes in the weather. Mental intake and sleep were normal, bowel and bladder functions were normal, tongue was pale, tongue coating was dark, pulse was stringy and nsmooth. Western medicine diagnosis: Avascular necrosis of the left femoral head; Traditional Chinese Medicine diagnosis: Bone erosion (Qi stagnation and blood stasis syndrome). Differential analysis: The patient is a young male with a history of excessive alcohol consumption. Alcohol consumption led to impaired Qi circulation, resulting in blood circulation disorders, which in turn caused pathological changes in the blood. Blood stasis can further aggravate Qi stagnation. The liver governs dispersion and stores blood, and the dispersion function of liver Qi plays a key role in the smooth operation of Qi. Therefore, Qi stagnation and blood

stasis are often closely related to liver dysfunction in dispersion. Impaired Qi circulation leads to impaired blood circulation, and impaired blood circulation leads to impaired Qi circulation, causing local blood stasis, leading to stagnation leading to pain, hence the pain in the left hip. Considering the patient's pale tongue, dark tongue coating, and stringy and nsmooth pulse, the diagnosis is bone erosion (Qi stagnation and blood stasis syndrome). The disease location is in the left hip, and the nature of the disease is a mixture of deficiency and excess. Therefore, the treatment of this disease focuses on promoting blood circulation and removing blood stasis, relieving pain, and at the same time, it is necessary to nourish the liver and kidneys. The prescription is modified from the Danxian Huogu Decoction, as follows: Salvia miltiorrhiza 12g, Angelica sinensis 6g, Safflower 10g, Safflower 10g, Red Peony Root 10g, Curcuma zedoaria 9g, Drynaria fortunei 12g, Dipsacus asperoides 12g, Epimedium 9g, Chuanxiong 10g, decocted in water, taken every 2 days, divided into three doses, a total of 14 doses, taken half an hour after meals in the morning and evening. At the same time, the patient was advised to rest in bed as much as possible, maintain a cheerful mood, avoid movements such as flexion and adduction, internal rotation, flexion and abduction, external rotation, and hyperflexion of the hip joint, and was advised to maintain a light diet during the medication period.

On July 20, 2023, the second diagnosis revealed that the patient reported a significant reduction in left hip pain, which no longer affected their daily rest. The range of motion in the hip joint had improved significantly compared to before. Examination showed slight pain in the left hip, with mild tenderness in the groin area. There was no pain radiating to the anterolateral aspect of the left thigh. Squatting was slightly limited, but there was no significant atrophy of the quadriceps muscles on both sides. The left leg standing test was negative, while the left greater trochanter lateral percussion pain was positive. The left groin midpoint pressure pain was positive, as was the left Patrick's test. Flexion, adduction, and internal rotation tests were positive, as were the external rotation and abduction tests. The hyperflexion test was positive. There was no tenderness in the lumbar spine segments or the sacroiliac joints. The muscle strength in both lower limbs was grade 5, and there were no obvious abnormalities in blood circulation or sensation. Physiological reflexes were present, and pathological reflexes were not elicited. The visual analog scale (VAS) score for the hip joints was 2 for the left and 0 for the right. The previous prescription was continued, with the same decoction method as before.

On August 21, 2023, the third diagnosis, the patient reported no special discomfort, squatting and normal walking and living were not affected, the left hip joint could move, and no significant pain was reported during movement. The previous prescription was continued, and the decoction method remained the same as before.

On September 16, 2023, during the fourth diagnosis, the patient reported no significant discomfort, and thus stopped taking traditional Chinese medicine. Follow-up for three months showed no significant discomfort reported.

Note: Patient is a young male with a history of heavy drinking, which has caused the qi to flow poorly, leading to blood

circulation disorders. This results in the left femoral neck and surrounding collaterals and channels being obstructed with blood stasis. The stagnation of blood stasis impedes the nourishment of new blood, and without new blood nourishing the bone, regeneration is hindered. As stated in "Su Wen on Bi Syndrome," "Bi syndrome in the bone causes heaviness, in the vessels causes blood to congeal and not flow, in the tendons causes flexion without extension, and in the muscles causes numbness." "Su Hui - On Inverted Regulation" states, "When the Ying (nutritive) Qi is deficient, there is numbness; when the Wei (defensive) Qi is deficient, there is paralysis; when both are deficient, there is numbness and paralysis." The treatment should focus on promoting blood circulation and removing stasis, relieving pain, and at the same time, it is necessary to tonify the liver and kidneys [10]. In the Danxian Huogu Decoction, *Salvia miltiorrhiza* is the sovereign herb, with a bitter taste and slightly cold nature, it excels at promoting blood circulation and generating new blood, relieving pain, and its function is equivalent to that of *Siwu Decoction*, making it nourishing and painless, and unobstructed and painless. It is assisted by *Angelica sinensis*, *Safflower*, *Red Peony*, *Red Peony*, and *Curcuma zedoaria* as ministerial herbs to aid in the function of promoting blood circulation and removing stasis. The assistant herbs include *Drynaria fortunei*, *Teasel Root*, and *Epimedium* to nourish the kidneys and strengthen the bones. Since the liver stores blood, *Chuanxiong* is used as the envoy herb to guide the formula into the liver channel. The entire formula works together to promote blood circulation and remove stasis, and to nourish the kidneys and strengthen the bones.

Conclusion: ONFH is commonly caused by trauma, long-term alcohol consumption, or the use of high doses of corticosteroid drugs. In the early stages, there are often no specific changes, but in the middle and late stages, structural changes in the femoral head, collapse, and joint dysfunction may occur. For middle-aged and elderly patients with ONFH, artificial joint replacement can be considered as the preferred treatment option. However, for younger patients, the long-term efficacy of artificial joint replacement is difficult to predict, and the limited lifespan of artificial joints increases the possibility of revision surgery, causing additional pain and economic burden to the patient. Traditional Chinese medicine (TCM) offers a rich approach to treating ONFH. Professor Shen Fengjun believes that the development of this disease is a process of struggle between pathogenic factors and the body's resistance. It is not advisable to use only one method, such as promoting blood circulation or eliminating pathogenic factors. Instead, the basic treatment principles of removing stasis, promoting new tissue growth, and bone healing should be established. Understanding the relationship between "deficiency and stasis," different treatments should be applied at various stages of the disease, accompanied by different symptoms. The drawback is the insufficient long-term follow-up time. For patients with early-stage avascular necrosis of the femoral head treated with oral Chinese medicine, the long-term efficacy is unknown. Therefore, for patients with advanced femoral head necrosis, elderly patients, and those who do not respond to conservative treatment or oral Chinese medicine, core decompression, vascularized bone grafting, hip preservation surgery, hip function reconstruction, and hip replacement are also powerful supplements to TCM treatment for avascular necrosis of the

femoral head. Moreover, during the treatment process, providing patients with functional rehabilitation exercises and guidance on diet and daily living is also very important. In summary, oral Chinese medicine treatment plays a positive role in improving the quality of life for patients, enhancing limb mobility, and alleviating disease symptoms.

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