

Effect of Chaihu Shugan Powder on New Anxiety Disorder after Coronary Artery Stenting

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Abstract: Coronary atherosclerotic heart disease refers to coronary atherosclerosis caused by narrowing or obstruction of the vascular lumen, or coronary artery functional spasm caused by myocardial ischemia, hypoxia, or necrosis caused by heart disease, is an ischemic heart disease. Its morbidity and mortality are increasing year by year. Coronary artery stenting has become a standard method for treating coronary heart disease due to its minor trauma and rapid recovery advantages. However, various reasons, such as a lack of understanding of the disease, the surgical process, and long-term use of drugs, lead to difficulty in self-control of the patient's mood, followed by tension and anxiety disorders. Relevant studies have shown that anxiety is a significant risk factor for the occurrence, development, and prognosis of coronary artery stenting. Given new anxiety disorders after coronary artery stenting, traditional Chinese medicine treatment, such as Chaihu Shugan San, often brings excellent improvement. This article discusses the mechanism of action of Chaihu Shugan Powder. It provides a scientific basis for Chaihu Shugan Powder in treating new anxiety disorders after coronary artery stenting for clinical reference.

1. Introduction

Coronary atherosclerotic heart disease refers to coronary atherosclerosis caused by narrowing or obstruction of the vascular lumen, or coronary artery functional spasm caused by myocardial ischemia, hypoxia, or necrosis caused by heart disease, is an ischemic heart disease. Its morbidity and mortality are increasing year by year. According to statistics, cardiovascular disease death has now become the first cause of total death in urban and rural residents [1]. Coronary artery stenting has become a standard method for treating coronary heart disease due to its minor trauma and rapid recovery advantages. However, various reasons, such as a lack of understanding of the disease, the surgical process, and long-term use of drugs, lead to difficulty in self-control of the patient's mood, followed by tension and anxiety disorders. Relevant studies have shown that anxiety is a significant risk factor for the occurrence, development, and prognosis of coronary artery stenting [2]. Given new anxiety disorders after coronary artery stenting, traditional Chinese medicine treatment, such as Chaihu

Shugan San, often brings excellent improvement. Pharmacological studies have shown that Chaihu Shugan Powder has the effects of regulating blood glucose and blood lipids, anti-inflammation, regulating neurotransmitter disorders, protecting the liver, and anti-fibrosis [3], and has been widely used in clinical practice, confirming that it is effective in the treatment of new anxiety disorders after coronary stenting. This article discusses the mechanism of action of Chaihu Shugan Powder. It provides a scientific basis for Chaihu Shugan Powder in treating new anxiety disorders after coronary artery stenting for clinical reference.

2. Application of coronary stent implantation in clinical practice and factors of poor prognosis

Coronary artery stenting is a permanent placement of stents in coronary artery stenotic lesions, and balloon catheter dilatation release or self-expansion mode makes the stenotic coronary vessels repellent, thereby improving the blood flow in the coronary arteries of patients, then reducing the mortality rate of acute myocardial infarction [4], which is a rapid onset and minimally invasive therapeutic procedure and is widely used in the treatment of coronary heart disease, as shown in Figure 1 and Figure 2.

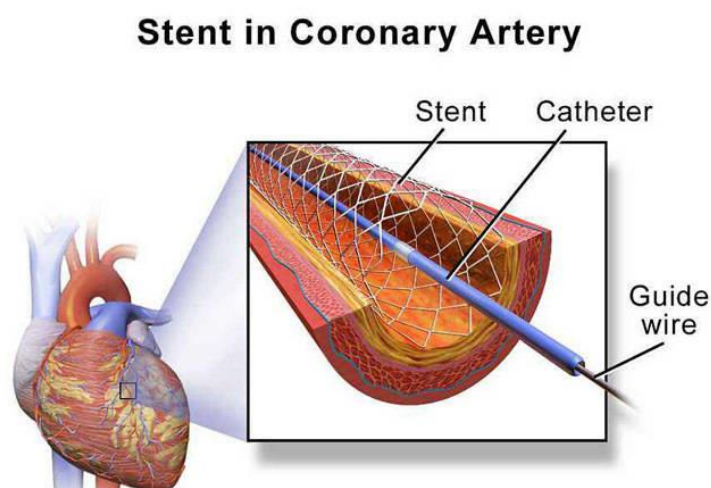


Figure 1: Coronary artery stenting

Stent with Balloon Angioplasty

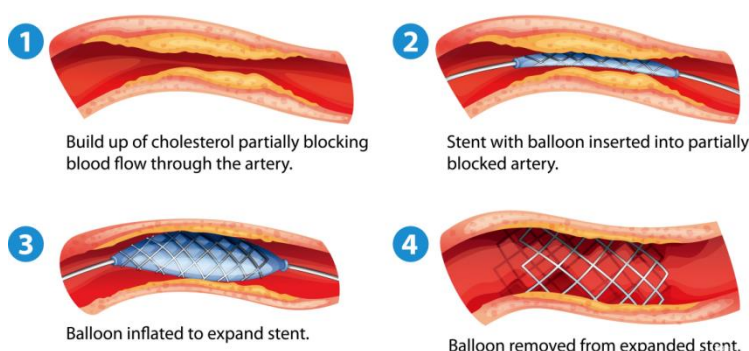


Figure 2: Specific steps of coronary artery stenting

However, due to the fear of the unknown disease itself, long-term use of anticoagulants after surgery is required, including high emotional sensitivity, limited social function caused by concerns about postoperative stent restenosis, adverse effects of stent therapy on the patient itself [5] and

various uncertain factors such as controlling multiple complications, and negative emotions such as tension and anxiety caused by the patient primarily affect the development and prognosis of the disease. According to relevant data, approximately 24.4% of patients experience stress and anxiety after surgery [6]. Mechanistically, anxiety disorders can cause autonomic dysfunction in patients [7] through sympathetic stimulation, resulting in increased heart rate and blood pressure, thereby increasing myocardial oxygen consumption and then affecting the development and prognosis of the disease.

3. Prevention and treatment of new-onset anxiety disorder after coronary artery stenting

Aiming at the anxiety and depression symptoms affecting daily life and workability of patients after coronary artery stenting, including pulse, chest tightness, chest pain, dizziness, headache, dyspnea, loss of appetite, sleep disorders, etc., many scientists study the way to solve them from different directions. Yin Ping et al. [8] showed that it could effectively reduce the occurrence of postoperative complications and facilitate the prognosis and recovery of patients by improving the nursing methods to study the anxiety and the impact of postoperative complications. Zheng Xiaoling et al. [9] looked at the results of Deanxit in treating depression after coronary stent implantation, suggesting that it can effectively relieve depression and improve the prognosis and development of patients after coronary stent implantation. Zhang Suqin et al. [10] studied that Jieyu Pills combined with Deanxit had a significant effect in treating depression after coronary artery stenting, which could significantly reduce anxiety and depression, with high value in clinical application. Shugan Jieyu Capsule can relieve liver depression and anxiety; rTMS can regulate excitatory neuron gene expression by affecting a variety of neurotransmitters and transmission and play a role in improving anxiety symptoms. Huang Qiong et al. [11] studied that the combination of the two can significantly play a role in improving anxiety, thus playing a role in improving the prognosis.

Therefore, there are countless methods to treat anxiety disorders after coronary stenting. First, physicians can give psychotherapy to patients, including cognitive behavioral therapy, psychoeducation, and relaxation skills, encourage patients to actively communicate with family and friends, participate in pleasant social activities, carry out relaxation skills exercises, etc., to help patients relieve symptoms and improve the quality of life; second, drug therapy, in Western medicine, the causes of anxiety disorders are related to neurotransmitter imbalance, neuroendocrine conditions, psychosocial factors, etc., generally use antidepressants, anxiolytics and other symptomatic treatment, by regulating the balance of neurotransmitters and hormones, relieve symptoms. However, most patients will worry about their dependence on neurodrugs, so in clinical practice, most tend to take traditional Chinese medicine preparations to treat such symptoms.

4. Understanding and Application of Traditional Chinese Medicine for Anxiety Disorders

In traditional Chinese medicine, anxiety disorders can be attributed to the "depression syndrome." Its pathogenesis is emotional stimulation, first injuring the liver, causing liver loss and catharsis, rigidity, and softness, just and the heart, softness and spleen and lung, resulting in the imbalance of qi, blood, yin, and yang [12]. "Huang Di Nei Jing" said: "The cause of the disease is stagnation of liver qi. Stagnation of liver qi blocks meridians to result in chest pain and poor rest. And Liver qi invades spleen and stomach to result in abdominal fullness, abdominal and the intestines chirp." So soothing the liver and regulating qi is a top priority, and the treatment should follow its essence. Therefore, the key to treating anxiety lies in soothing the liver and relieving depression, regulating qi, and relieving pain.

5. Understanding of Chaihu Shugan Powder

5.1. Application of Chaihu Shugan Powder

Chaihu Shugan Powder, as a classic prescription for the treatment of liver depression syndrome in the past dynasties [13], is widely used in the treatment of anxiety, depression, and other emotional disorders in clinical practice. In modern medical research, scholars have shown that Chaihu Shugan Powder treats anxiety, depression, and other emotional disorders through drug efficacy comparison and other related experiments. Liao Dandan et al. [14] showed through the study of relevant literature that combining Chaihu Shugan Powder with Western medicine treatment of coronary heart disease improves the ECG of patients with coronary heart disease and depression, relieving anxiety and depression, the clinical effect is significant. Li Yongcong et al. [15] used Chaihu Shugan Powder combined with citalopram hydrobromide to treat patients with post-stroke depression and liver-qi stagnation syndrome, suggesting that it significantly improved the depressive symptoms and sleep quality of patients, promoted the repair of neurological function of patients, and improved the effect of TCM syndrome and medication safety. Cai Yan et al. [16] reviewed the latest research progress by referring to the domestic literature, indicating that Chaihu Shugan Powder can achieve antidepressant effect by affecting the plasticity of hippocampal neurons and the expression of p-CREB and other related factors. Gao Xuesong et al. [17] studied Chaihu Shugan Powder to intervene in depression-like rats and found that it could effectively improve the depressive state in various ways.

5.2. Formula of Chaihu Shugan Powder

Chaihu Shugan Powder comes from the Medical System and consists of *Bupleurum chinense*, *Radix Paeoniae Alba*, *Rhizoma Chuanxiong*, *Fructus aurantii Immaturus*, *Pericarpium Citri Reticulatae*, *Rhizoma Cyperi*, and *Radix Glycyrrhizae*. Doctors have different opinions on the efficacy of Chaihu Shugan Powder. "Jingyue Quanshu" records: "Chaihu and peony can soothe the liver and relieve depression; Juniper, *Fructus Aurantii* and tangerine peel can soothe the liver and regulate qi; *Chuanxiong* can promote blood circulation; Licorice can relieve pain." *Six Books of Medicine* said: "Chaihu can soothe the liver and relieve depression, *Shanzhizi* can clear fire and cool blood, red peony can astringe yin and stop bleeding, *Chuanxiong* can activate blood and remove stasis, *fructus aurantii* can dispell qi and eliminate stagnation, tangerine peel and juniper bark can regulate qi and relieve depression, and licorice can relieve pain. The above traditional Chinese medicines are commonly used for reducing fire and resolving blood stasis in children." For scattered decoction, the raw sharp and cooked sex alcohol, so that the anger flat is liver depression self-solution, liver collateral clear, and there is hypochondriac pain hematemesi!" Now, the most commonly used is the formula recorded in the "Qianzhai Medical Lecture" [18]: "This prescription is Sini Powder plus *Chuanxiong*, *Cyperus rotundus*, and blood qi, the treatment of hypochondriac pain, cold and heat exchange, especially to soothe the liver. *Bupleurum chinense*, *Citrus aurantium*, *Cyperus rotundus* qi are the main, *Radix Paeoniae Alba*, *Rhizoma Chuanxiong* and blood as an adjunct, and then licorice to slow it. It is the normal method of soothing the liver and can be described as good at using ancient prescriptions. "

5.3. Mechanism of action of Chaihu Shugan Powder

"Drug Huayi" has said: "*Bupleurum chinense* light Qing Zhu Sheng San, taste slightly bitter main Shugan. *Bupleurum chinense*, as the monarch drug of this prescription, was first published in the *Shennong Ben Cao Jing*, listed in the top grade, and widely used in clinical practice, and a total of five articles on "hey, " "depression and slight annoyance, " "annoyance" and "upset" were recorded in

the book *Treatise on Febrile Diseases*, involving four prescriptions, all of which had the presence of *Bupleurum chinense*. Its pathogenesis was gall bladder or qi depression, or fire depression, and catharsis was unfavorable[19]. It also shows that *Bupleurum chinense* is longer than *Shugan Jieyu*; its meridians are the liver and gall bladder meridians[20]. Modern pharmacology has shown that *Bupleurum chinense* contains saponins, flavonoids, volatile oils, and other components, with antidepressant effects, anti-inflammatory and antioxidant effects, protection of the heart, and protection of the liver [21]. *Cyperus rotundus* is one of the commonly used traditional Chinese medicines in clinical practice, which was originally contained in the Wei and Jin Dynasties "Famous Doctors Bie Lu"[22], and "New Compilation of Materia Medica" calls it "the product that attracts blood drugs to the gas fraction and must be used in qi and blood." Pharmacological effects include slowing heart rate, cardiostimulant, antihypertensive, hypoglycemic, and antidepressant [23], and its volatile oils have many active components, including sesquiterpenes, α -cyperone, and isobutene-5-one, which play a crucial role in the treatment of depression[24]. *Chuanxiong* was first found in the Tang Dynasty "Xian Shu Li Shang Dipsacus Secret Formula" [25], which has the effect of promoting qi and activating blood circulation and relieving pain, and is widely used in the treatment of cardiovascular and cerebrovascular diseases, with a significant effect. Pharmacological studies have shown that *Chuanxiong* contains alkaloids, volatile oils, phthalides, and organic acids, which have the effects of inhibiting angiogenesis, increasing high-density lipoprotein levels, improving vascular calcification, protecting myocardial ischemic injury, improving myocardial fibrosis, improving myocardial infarction, and improving cardiac function [26]. *Cyperus rotundus* is a minister of medicine who enhances the function of qi pain relief and relieves stagnation of the liver meridian. Since the past dynasties, the viewpoint of "white tonifying red diarrhea" has been the most respected, such as "where *Poria cocos* and *Paeonia lactiflora* are adopted in Qianjin Fang, tonifying drugs must be white, and laxatives must be red" [27] *Radix Paeoniae Alba* has the effects of nourishing the liver and converging yin, softening the liver and relieving pain, and is used in combination with *Radix Bupleuri*. Both of them are collected together. *Radix Bupleuri* can make its Xin San. *Radix Paeoniae Alba* can make its Xin San. *Radix Bupleuri* can make its acid convergence, and the liver has body yin and yang physiological characteristics. Its chemical constituents are mainly volatile oils, monoterpenoids, triterpenoids, and flavonoids, which have a wide range of pharmacological effects and have inhibitory effects on the central nervous system and have antidepressant, antithrombotic, hypolipidemic, hypoglycemic, hepatoprotective, improving myocardial hypertrophy, and improving ischemia-reperfusion effects [28]. Adjuvant drugs tangerine peel and *aurantium aurantium* have a strong effect in regulating qi and widening. *Citrus aurantium* is bitter, spicy, sour in taste, and cold in nature; it enters the lung, spleen, and large intestine meridians and has the effects of removing blood stasis, supplementing qi, reducing phlegm, and eliminating distension. It is a commonly used qi regulating traditional Chinese medicine in clinical practice in traditional Chinese medicine, and hesperidin and orange contained in *Citrus aurantium* can play a role in reducing vascular fragility, preventing atherosclerosis, maintaining normalization of vascular osmotic pressure, and preventing and treating cardiovascular diseases[29]. *Pericarpium Citri Reticulate* can regulate qi and invigorate the spleen, remove dampness and phlegm, taste pungent, bitter, warm, regulate the mechanism of spleen and stomach rise and fall, dredge liver-qi, drain bile, and promote spleen and stomach function [30], have volatile oils, flavonoids, alkaloids, inositol and other components, and have cardiostimulant, lipid-lowering, anti-atherosclerotic, hepatoprotective, anti-platelet and cell condensation, antioxidant, and regulation of hormone balance [31]. Both can purge the stagnation of spleen qi, adjust the movement of middle qi and *Bupleurum* with a rise and fall, and strengthen the function of soothing the liver and regulating qi to achieve depression. Modern studies have shown [32] that the characteristic active components of *Glycyrrhiza uralensis* are mainly glycyrrhizin, glycyrrhizic acid, glycyrrhizin, and glycyrrhiza chalcone, and compatibility in clinical practice often has anti-

inflammatory, cardiovascular and cerebrovascular protection and neurological, anti-tumor effects. Glycyrrhiza uralensis began in Shennong Ben Cao Jing and has the effects of tonifying the spleen and supplementing qi, clearing away heat and toxic substances, eliminating phlegm and relieving cough, relieving pain with urgency, and harmonizing various drugs, which are also known as "Guolao" and "the owner of all drugs" because of its widespread use[33]. Compatible with Zhishi, can be used to protect against cardiovascular and cerebrovascular diseases; compatible with Chuanxiong, can be used to protect nerves; compatible with Paeonia lactiflora to exert the function of urgency and pain relief. Secondly, the significance of licorice "slowing" lies in reducing the adverse reactions of traditional Chinese medicine and, to a certain extent, making the drug effect more moderate and lasting. Therefore, after coronary artery stent implantation, the patient developed anxiety, depression, and other psychological stress reactions, and Chaihu Shugan Powder was considered for treatment.

6. Typical medical records

The patient, a 65-year-old woman, was newly diagnosed on December 7, 2021. Chief complaint: 1 year after coronary stent implantation, complicated with chest distress and discomfort for three months. History of present illness: 3 months ago, the patient had chest distension and stuffiness discomfort, which was aggravated when the mood changed. The symptoms could be relieved after rest, without chest pain, shoulder and back radiating pain, syncope amaurosis, or other discomforts. Usually like to sigh, accompanied by poor appetite, dry mouth, bitter taste, poor sleep, dry stool, normal urine, red tongue, thin white fur, pulse string. Past medical history: A stent was implanted in the anterior descending branch one year ago. Coronary angiography two months ago showed no obvious progressive blood vessel lesion. The patient took orally "Aspirin Enteric-coated Tablets 100 mg QD and Rosuvastatin Tablets 10 mg qn" for a long time to control the disease condition. The patient had a history of hypertension for three years, with a maximum blood pressure of 180/? Mm Hg. The patient took Shihuida 2.5 mg QD orally to control blood pressure and complained that the blood pressure was maintained at about 140/? Mm Hg. Western diagnosis: (1) Coronary atherosclerotic heart disease stable angina pectoris; (2) Status after coronary stent implantation; (3) Hypertension (grade 3, very high risk); TCM diagnosis: chest paralysis (heart blood stasis); Treatment: promoting blood circulation to remove blood stasis, promoting qi, and soothing the liver. Chaihu Shugan Powder was selected for addition and subtraction. The prescription was as follows: Radix Bupleuri 15g, Radix Paeoniae Alba 10g, Rhizoma Chuanxiong 15g, Fructus aurantii 10g, Pericarpium Citri Reticulate 15g, Rhizoma Cyperi 10g, Radix Glycyrrhizae 6g, Radix Salviae Miltiorrhizae 20g 7 doses, one dose per day, decoction, divided into morning and evening two times orally. Long-term regular administration: Aspirin Enteric-coated Tablets 100 mg po qd; Rosuvastatin Tablets 10 mg po qn; Shihuida Tablets 2.5 mg po qd.

On December 16, 2021, the patient complained that chest distress was relieved than before but still felt a bitter taste, like a sigh. They had a general sleep, an increased diet, and urinated and defecated. Red tongue, thin white fur, pulse string. Office blood pressure was 144/78 mm Hg. The newly diagnosed formula was added with 5 g of Gardenia jasminoides and 10 g of Neem, seven doses, and the decoction method was the same as before. The remaining treatment regimens were the same as before.

The patient did not come back to the clinic after three visits. During the follow-up in March 2022, the patient complained of intermittent administration of Sanzhi Fang during the period, without further attack of apparent chest tightness, bitter taste, like sigh was significantly relieved than before, sleep was expected, and blood pressure was stable at about 140/80 mm Hg.

7. Conclusion

In conclusion, as a classic prescription for soothing the liver and relieving depression, Chaihu Shugan Powder is suitable for treating psychological stress reactions such as anxiety and depression after coronary artery stenting. Its active ingredients have a variety of biological activities, can regulate body function from multiple aspects, improve the anxiety and depression symptoms of patients, and improve the quality of life of patients. However, in clinical application, it is necessary to treat the drug according to the specific condition and physical condition of the patient with syndrome differentiation to ensure the safety and effectiveness of the medication.

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