

# World Journal of *Clinical Cases*

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# Rheumatic valvular heart disease treated with traditional Chinese medicine: A case report

Wei-Hang Chen, Yan Tan, Ya-Lei Wang, Xu Wang, Zhao-Heng Liu

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## Abstract

### BACKGROUND

Rheumatic heart disease (RHD) is an autoimmune disease that leads to irreversible valve damage and heart failure. Surgery is an effective treatment; however, it is invasive and carries risks, restricting its broad application. Therefore, it is essential to find alternative nonsurgical treatments for RHD.

### CASE SUMMARY

A 57-year-old woman was assessed with cardiac color Doppler ultrasound, left heart function tests, and tissue Doppler imaging evaluation at Zhongshan Hospital of Fudan University. The results showed mild mitral valve stenosis with mild to moderate mitral and aortic regurgitation, confirming a diagnosis of rheumatic valve disease. After her symptoms became severe, with frequent ventricular tachycardia and supraventricular tachycardia > 200 beats per minute, her physicians recommended surgery. During a 10-day preoperative waiting period, the patient asked to be treated with traditional Chinese medicine. After 1 week of this treatment, her symptoms improved significantly, including resolution of the ventricular tachycardia, and the surgery was postponed pending further follow-up. At 3-month follow-up, color Doppler ultrasound showed mild mitral valve stenosis with mild mitral and aortic regurgitation. Therefore, it was determined that no surgical treatment was required.

### CONCLUSION

Traditional Chinese medicine treatment effectively relieves symptoms of RHD, particularly mitral valve stenosis and mitral and aortic regurgitation.

**Key Words:** Rheumatic heart disease; Valvular damage; Mitral stenosis; Chinese formulas; Traditional Chinese medicine treatment; Case report

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**Core Tip:** Rheumatic heart disease (RHD) is an autoimmune disease. This case report describes a 57-year-old woman with a 1-year history of RHD who presented with chest tightness, palpitations, and fatigue. She was successfully treated with the modified Ling Gui Zhu Gan decoction. We discuss how this prescription became an effective treatment for RHD.

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## INTRODUCTION

Rheumatic heart disease (RHD) is an autoimmune disease caused by group A streptococcal infection in the throat, lungs, and heart[1]. This disease can affect multiple organs and lead to irreversible valve damage and heart failure, with mitral stenosis being the most common. The predisposing cause of RHD is acute rheumatic fever. The most common symptoms of RHD are palpitations, shortness of breath, chest tightness, asthma, fatigue, and weakness[2,3]. This condition remains a significant global health burden, with high health care costs and significant technical expertise required for multidisciplinary approach to management[4]. Surgery is a relatively effective treatment for RHD. However, long-term postoperative medication significantly limits the quality of life for patients with RHD.

## CASE PRESENTATION

### Chief complaints

A 57-year-old woman was evaluated for palpitations, chest tightness, and weakness that began more than 1 year ago. Her symptoms had become increasingly severe, with frequent ventricular tachycardia and supraventricular tachycardia > 200 beats per minute.

### History of present illness

The patient was evaluated by the internal medicine team on January 10, 2021. She described experiencing palpitations and chest tightness for the past 1 year. In addition, she reported poor sleep quality, chronic cold hands and feet, sore mouth, and dry throat. On physical examination, she was slightly obese and had a good pulse. Petechiae were observed on her tongue and her lips and tongue appeared dark red.

### History of past illness

The patient has no history of past illness.

### Personal and family history

The patient has no personal and family history.

### Physical examination

The patient has no physical examination.

### Laboratory examinations

The patient has no laboratory examinations.

### Imaging examinations

Imaging examinations showed the following: aortic root internal diameter 31 mm; left atrial internal diameter 38 mm; left ventricular (LV) end-diastolic diameter 46 mm; LV end-systolic diameter 30 mm; interventricular septum thickness of 8 mm; LV posterior wall thickness 8 mm; and pulmonary artery systolic pressure 34 mm Hg, as shown in Table 1 (Before Treatment).

Her LV ejection fraction was 64%. Mitral flow mapping showed a stenotic waveform tissue Doppler imaging (TDI) and an S wave peaking at 10 cm/s. The mitral valve was thickened, and the leaflets were open and protuberant. The area of aortic regurgitation was approximately 3.9 cm<sup>2</sup>, according to two-

**Table 1 M-mode and blood flow Doppler ultrasound measurement: Comparison of traditional Chinese medicine prescription before and after treatment**

Name	Measured value		Normal value (mm)
	Before treatment	After treatment	
Inner diameter of aortic root	31	35	20-37
Inner diameter of the left atrium	38	40	19-40
LV end-diastolic diameter	46	44	35-56
LV end-systolic diameter	30	31	23-35
Septal thickness	8	8	6-11
LV posterior wall thickness	8	8	6-11
Aortic regurgitation area <sup>a</sup>	3.9 cm <sup>2</sup>	2.4 cm <sup>2</sup>	Mild to moderate < 8 cm <sup>2</sup> ; Moderate 3-5 cm <sup>2</sup> ; Mild < 3 cm <sup>2</sup>
LV ejection fraction <sup>a</sup>	64%	70%	50%-70%

<sup>a</sup>Represents our main improvement indicator. Note: Before treatment data are from the echocardiographic diagnosis report of Zhongshan Hospital of Fudan University, whereas after treatment data are from the echocardiographic diagnosis report of Fuwai Hospital, Chinese Academy of Medical Sciences. LV: Left ventricular.

dimensional tracings. The leaflet closing morphology was unremarkable, and color Doppler indicated mild to moderate mitral regurgitation.

## FINAL DIAGNOSIS

The patient was diagnosed with mild to moderate RHD based on the color Doppler echocardiography, LV function tests, and TDI. From the approach of traditional Chinese medicine, the diagnosis of chest obstruction was made based on her main clinical symptoms, and the syndrome type was heart and kidney yang deficiency.

## TREATMENT

Based on the patient's symptoms, imaging results, and diagnosis, the medical team scheduled the patient for mitral valve repair surgery in 10 d. The patient requested that treatment be initiated immediately with traditional Chinese medicine during this preoperative waiting period.

For treatment with traditional Chinese medicine, we used a self-prepared formula containing *Radix Astragali* (10 g), *Ramulus Cinnamomi* (6 g), *Rhizoma Atractylodis* (15 g), *Radix et Rhizoma Glycyrrhizae* (9 g), *Radix Saposhnikoviae* (10 g), *Radix Paeoniae Alba* (10 g), *Radix Paeoniae Rubra* (10 g), *Radix puerariae* (10 g), *Rhizoma Phragmitis* (15 g), *Radix Ophiopogonis* (10 g), *Flos Lonicerae Japonicae* (10 g), *Poria* (10 g), *Radix et Rhizoma Salviae Miltiorrhizae* (10 g), *Rhizoma Curcumae* (10 g) and *Pericarpium Citri Reticulatae* (15 g). The main functions of this formula are diuresis and dehumidification, promoting blood circulation and removing blood stasis. To administer the daily dose, formula is boiled with water and taken 30 min after breakfast and dinner.

After 7 d of treatment, the patient was evaluated at follow-up on January 23, 2021. She reported relief of her symptoms and described feeling that her "heart became warm and moist." The patient adhered to the traditional Chinese medicine treatment for another 21 d after this evaluation.

## OUTCOME AND FOLLOW-UP

At 3 mo follow-up (April 12, 2021), the patient was examined at Fuwai Hospital of the Chinese Academy of Chinese Medical Sciences (Table 1, After Treatment). Compared with the previous results of the color Doppler ultrasound, the patient showed improvement in aortic regurgitation from moderate (3.9 cm<sup>2</sup>) to mild (2.4 cm<sup>2</sup>) and in the LV ejection fraction from 67% to 70%. The patient was followed weekly for 6 months after initiation of the traditional Chinese medicine treatment, and the ventricular tachycardia did not reappear. Her improvement of cardiac symptoms was attributed to the effects of the 20 administered herbs. At the final follow-up 1 mo later (May 11, 2021), the result was RHD with mild



mitral stenosis and mild regurgitation and aortic regurgitation.

## DISCUSSION

Rheumatic heart disease is a major global health problem, causing approximately 300000 deaths yearly [5]. This disease predominantly affects the heart valves, which may have inflammatory adhesions, calcinosis, and fibrosis. Each valve of the heart has a different probability for manifesting RHD. Mitral valve stenosis is the most often affected valve in RHD and is common among female patients. Patients with RHD usually have poor quality of life given the high rates of disability and mortality [6-8]. However, the exact pathogenesis of valve impairment remains unclear. It is believed that in the susceptible populations, specific strains of group A streptococci trigger the formation of autoantibodies in the host tissues, including the heart, through molecular mimicry, ultimately leading to valve damage [9].

As a noninvasive approach, Doppler echocardiography has become one of the primary methods for the clinical diagnosis of valvular pathology. This imaging study measures the size of the heart chamber and ventricular function. It also measures the pressure difference across the valve, the valve opening area, the pulmonary artery pressure, and other indicators. It is essential to distinguish RHD from other diseases, such as connective tissue disease, poststreptococcal infection, acute septic arthritis, rheumatoid arthritis, viral myocarditis, and infective endocarditis.

Surgery is often required to repair or replace the heart valves for patients with severely damaged valves. Percutaneous mitral balloon angioplasty has become a guiding principle for management of RHD, both nationally and internationally. It is recommended as the treatment for rheumatic mitral stenosis because of its low invasiveness, high safety, and short- and long-term efficacy [10,11]. However, expensive life-saving cardiac surgery is not available for all patients with RHD because only a few cardiac surgery facilities exist in low-income countries where RHD is endemic [12]. Previously, diuretics, angiotensin-converting enzyme inhibitors, beta-blockers, and anti-infectious agents were often administered in clinical practice, but the improvement of cardiac function was unsatisfactory.

In this case report, the patient, described the typical RHD symptoms, including palpitations, chest tightness, poor sleep, cold limbs over a long time, bitter mouth, and dry throat. Therefore, both before and after treatment, we administered the 36-Item Short Form Survey Instrument (SF-36, part of the Medical Outcomes Study) and the Visual Analog Scale (VAS) to evaluate the health status of patients. Compared with the SF-36 results before treatment with traditional Chinese medicine, the post-treatment results showed that the patient's health condition was improved, and the VAS results showed that the patient's degree of chest tightness was reduced both during the day and night (Figure 1 and Table 2). These results show that the Chinese herbal formula can achieve excellent results. Our analysis of this effect is that, from the perspective of traditional Chinese medicine, RHD is mainly caused by exogenous pathogenic wind, cold, and dampness.

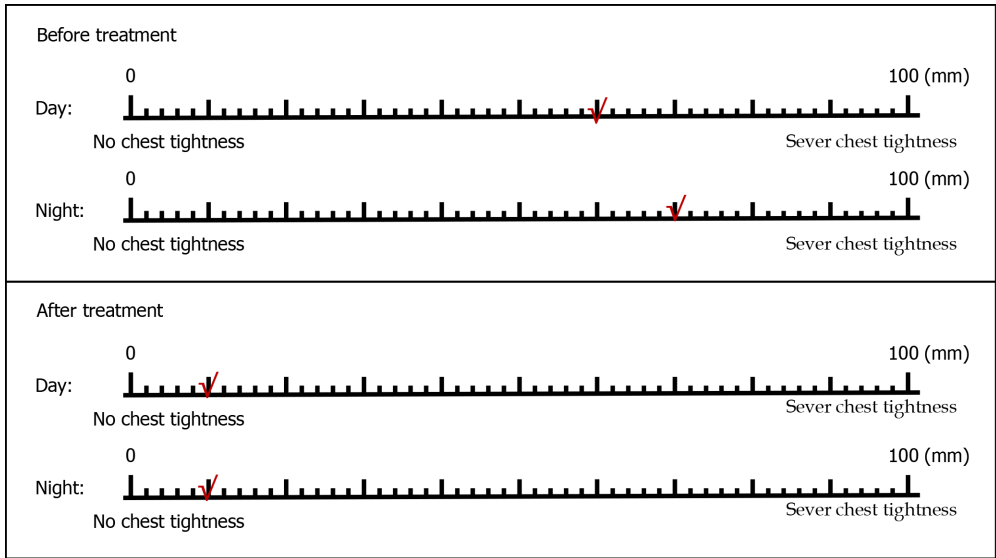
After treatment with Chinese herbal medicine, the patient's area of aortic regurgitation decreased significantly, and the ejection fraction increased. Our prescription formula uses *Ramulus Cinnamomi* to warm the yang qi and dispel the cold wind, and *Poria* is used to dispel dampness. These two agents can be used in combination for warming and tonifying yang so as to strengthen the heart and promote blood circulation; in addition, they function as a diuretic and dispel the wind, cold, and dampness so the symptoms can be relieved. Chemical medicine, including diuretics and vasodilators, are used to reduce the high cardiac load. Thus, these two monarch drugs of traditional Chinese medicine may have the same functions as the chemical drugs.

The other herbs in this formula, such as *Radix Astragali* and *Rhizoma Atractylodis*, are used to replenish qi, strengthen the surface, spleens and soothe the heart. *Radix Paeoniae Alba* nourishes blood and regulates menstruation. *Radix Paeoniae Rubra* combined with *Radix et Rhizoma Salviae Miltiorrhizae* has the effect of activating blood circulation. *Radix et Rhizoma Glycyrrhizae* harmonizes all these herbs because it can open pathways of resistance and eliminate paralysis. Modern pharmacologic studies have shown that astragalus also enhances immunity, diuresis, antistress, and anti-inflammatory effects [13]. In addition, astragalus can enhance myocardial contractility, expand coronary arteries, and improve myocardial blood supply. glucosides of paeony improves hypoxia, promotes antioxidation, and relieves fatigue. *Atractylodes macrocephala* and *atractylodes rhizome* have diuretic and vasodilatory effects [14-16]. *Poria* can enhance immunity. *Ramulus cinnamomi* has diuretic, cardiogenic, vasodilator, analgesic, and anticonvulsant effects. *Rhizoma Curcumae* can inhibit platelet aggregation, improve microcirculation, promote arterial blood flow, and regulate immune function, with antibacterial, anti-inflammatory, and analgesic effects [17,18]. *Radix et Rhizoma Salviae Miltiorrhizae* contains tanshinone and other active ingredients that improve the symptoms related to heart disease; it also improves sleep disorders [19]. The flavonoids and puerarin in *Radix Puerariae Lobatae* reduce the peripheral resistance of the heart, nourish the heart muscle, and expand blood vessels [20,21]. Calcium isocitrate in *Rhizoma Phragmitis* can strengthen the heart and promote blood circulation [22]. The alcohol in *Pericarpium Citri Reticulatae* increases the elasticity of blood vessels [23]. At present, more than 10 types of RHD syndrome are known in traditional Chinese medicine, as follows: (1) Heart-blood stasis type; (2) Qi and yin deficiency type; (3)

Table 2 Comparison of scores of SF-36 health survey before and after treatment

Item	Before treatment (Full score 100 points) <sup>a</sup>	After treatment (Full score 100 points) <sup>a</sup>
Physical functioning	45	90
Role-physical	100	100
Bodily pain	80	100
General health	25	42
Vitality	40	80
Social functioning	62.5	87.5
Role-emotional	0	100
Mental health	40	76
Reported health transition	0	75

<sup>a</sup>The higher the score of each item in this table, the better the patient’s health status; therefore, these table data show that the patient's chest tightness has improved. Note: Before treatment data are from the echocardiographic diagnosis report of Zhongshan Hospital of Fudan University, whereas after treatment date are from the echocardiographic diagnosis report of Fuwai Hospital, Chinese Academy of Medical Sciences.



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**Figure 1 Comparison of the patient’s Visual Analog Scale results before and after treatment.** Results are shown for day and night for 0-10 min on a 0-100 mm scale, for which a score of 0 scale indicates no symptoms, and 100 indicates the most severe degree of chest tightness. The √ mark represents the mark that the patient makes on the corresponding scale according to their experience of the symptom.

Blood vessel stasis type; (4) Qi and blood deficiency type; (5) Blood stasis type; (6) Qi and blood deficiency type; (7) Heart and kidney yang deficiency type; and (8) Yang and yin deficiency type[24]. The intervention measures include traditional Chinese medicine formulas, Chinese patent medicine, acupuncture, and massage. Patients can be treated with traditional Chinese medicine alone or with traditional Chinese medicine combined with modern treatment. Currently, specific therapeutic indicators are lacking for the use of traditional Chinese medicine to treat RHD. Based on this patient’s experience and the discussion, this case report is expected to contribute to providing a higher quality schema for the use of traditional Chinese medicine to diagnose and treat RHD.

CONCLUSION

The case reported here suggests that herbal formula can effectively relieve the symptoms of RHD. These findings provide new insights into the treatment of RHD and a basis for further research to determine the underlying mechanisms.

## FOOTNOTES

**Author contributions:** Chen WH and Tan Y contributed equally to this work; Chen WH contributed to original draft writing and editing; Tan Y contributed to editing and data analysis; Wang YL and Wang X contributed to data collection; Liu ZH contributed to supervision; all authors have read and approved the final manuscript.

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