

Clinical Case Study and Mechanistic Insights into the Application of the Huangdi Nine Needles for Thromboangiitis Obliterans

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Abstract: This study explores, through a case analysis, the clinical efficacy and mechanisms of the Huangdi Nine Needles therapy in treating thromboangiitis obliterans (also known as Buerger's disease). For this study, a 45-year-old male patient was selected, with a total treatment duration of 8 months, carried out during the following periods: December 19-25, 2021; January 19-23, 2022; February 18-22, 2022; March 19-23, 2022; and August 23, 2022. The treatment included use of the Large Needle, Round Sharp Needle, and Triple Therapy with Filiform Needles, combined with symptom evaluation and B-ultrasound examination for comprehensive assessment. Results showed that the patient's intermittent claudication distance improved from 100 meters to normal walking capacity. The findings suggest that the Nine Needles therapy can improve limb ischemia through the synergistic effects of "warming and unblocking the meridians, dispelling stasis and clearing heat, and promoting Qi circulation through the channels." Its mechanism may be related to regulating microcirculation and reducing hypercoagulability of the blood. This study provides practical evidence for the use of traditional Chinese needling methods in treating vascular diseases, though larger sample sizes are needed to further validate its efficacy.

Keywords: Huangdi Nine Needles; Thromboangiitis Obliterans; Gangrene of finger or toe; Intermittent claudication; hemorheological parameters

1. Introduction

Thromboangiitis obliterans is a segmental inflammatory disorder that affects the small and medium-sized arteries and veins of the limbs. Its core pathology is vascular occlusion leading to ischemia of the affected limb. Clinically, it manifests as coldness of the extremities, intermittent claudication, and rest pain, and in severe cases may progress to ulcers or gangrene. Epidemiological data indicate that the disease predominantly affects young and middle-aged males and is strongly associated with smoking. Patients in advanced stages often face the risk of amputation due to limb ischemia and necrosis, which severely impacts their quality of life^[1]. Current modern medical treatments primarily rely on vasodilators, antiplatelet agents, and surgical revascularization, yet they are limited by modest efficacy and high postoperative recurrence rates.

The Huangdi Nine Needles is a classic set of instruments within the traditional Chinese acupuncture system. Its theoretical foundation originates from the The Yellow Emperor's Inner Canon·On the Nine Needles, which states that: "The nine needles reflect the big numbers of heaven and earth. They start from One and they end at Nine." By utilizing the distinct forms and functions of different needles (such as the large needle, round-sharp needle, and fine needle), the therapy aims to achieve the goals of "unblocking meridians, regulating Qi and Blood, and harmonizing Yin and Yang."

Among them, the large needle is used to relieve severe stasis, while the filiform needle treats cold, heat, pain, and impediment conditions in the meridians. These functions align closely with the pathogenesis of thromboangiitis obliterans, which TCM characterizes as "cold congealing and blood stasis, with impeded Qi and Blood flow." Traditional Chinese medicine holds that the Nine Needles can improve microcirculation and regulate immune function by stimulating meridian points, offering a distinctive therapeutic approach for vascular diseases^[2].

This study aims to systematically explore the clinical efficacy and mechanism of Huangdi Nine Needles in the treatment of thromboangiitis obliterans through a case analysis. Focusing on the treatment cycle and follow-up data of a single case, the study will observe core indicators such as symptom improvement and changes in hemorheological parameters (ultrasound examination results).

The goal is to provide a theoretical basis and practical reference for the use of TCM acupuncture in treating thromboangiitis obliterans, thereby promoting the innovative application of traditional therapies in modern medicine^[3].

2. Literature Review

As an integral component of the traditional Chinese medicine acupuncture system, the theoretical foundation of the Huangdi Nine Needles originates from the Yellow Emperor's Inner Canon: Spiritual Pivot, Chapter on the Nine Needles. According to this classical text, the design of the nine needles follows the “great numbers of Heaven and Earth” and consists of nine types: The spade needle, the rounded needle, the arrowpoint needle, the sharp point needle, the lancet needle, the round-sharp needle, the fine needle, the long needle, and the big needle. Each type has a distinct form and therapeutic characteristics^[4]. Among them, the large needle, measuring 4 inches in length, is used to relieve severe stasis and address intractable cold patterns; the round-sharp needle, measuring 1 inch and 6 fen in length, is inserted deeply with strong stimulation to alleviate intractable pain; the fine needle, measuring 3 inches and 6 fen in length, is retained for extended periods to nourish and treat cold, heat, pain, and impediment conditions in the meridians. These applications embody the holistic principle of “for each needle is a corresponding number”, as written about in The Yellow Emperor's Inner Canon·The Nine Needles and the Twelve Origin Openings^[2].

In TCM theory, thromboangiitis obliterans falls under the category of “gangrene of finger or toe”, and its etiology and pathogenesis are closely related to “cold congealing and blood stasis.” Clinical observations indicate that smoking is a core trigger, as nicotine can damage the vascular endothelium and induce vasospasm. Typical symptoms include limb pallor, weakened dorsalis pedis artery pulsation, skin nutritional disturbances, and, in advanced stages, ulceration and gangrene. Traditional Chinese medicine treatment primarily focuses on activating blood circulation and resolving stasis. However, existing research has notable limitations: on one hand, direct clinical evidence for treating TAO with the Huangdi Nine Needles is scarce, with most available literature concentrating on orthopedic conditions such as lumbar spine disorders; on the other hand, modern research predominantly employs standard filiform needles, failing to systematically replicate the differentiated application of the nine needles. Although a hospital in Chongqing has claimed to have ‘revived the Huangdi Nine Needle technique,’ the specific operational standards and therapeutic mechanisms have not been publicly reported in academic literature, resulting in a disconnect between traditional theory and modern practice^[1].

The current research gaps are mainly reflected in three aspects:

- 1) There is a lack of evidence supporting the specific selection of Nine Needles instruments for the pathogenesis of thromboangiitis obliterans, described in traditional Chinese medicine as “stasis obstructing the meridians.”
- 2) Mechanistic studies remain at the level of broad descriptions of efficacy, without objective validation through indicators such as hemorheology.
- 3) The number of case studies is insufficient, making it difficult to establish standardized treatment protocols.

This study, through in-depth case analysis, focuses on exploring the synergistic application of the large Needle to unblock severe stagnation and relieve stubborn cold syndromes, the round-sharp Needle for deep insertion and strong stimulation to alleviate persistent pain, and the fine Needle for prolonged retention to nourish and treat cold-heat pain syndromes in the meridians. Together, these approaches aim to fill the gap in mechanistic research on the Nine Needles for vascular diseases.

3. Research Methods

This study employs a case analysis method, selecting one patient diagnosed with thromboangiitis obliterans (gangrene of finger or toe) as the research subject to systematically observe the clinical efficacy and mechanism of the Huangdi Nine Needles. The research design follows the theoretical framework of the The Nine Needles and the Twelve Origin Openings from the Yellow Emperor's Inner Canon, integrating modern clinical research standards to explore the contemporary application value of traditional acupuncture techniques through standardized interventions and multidimensional outcome monitoring.

3.1 Subject Selection

The study subjects were patients who met the diagnostic criteria for gangrene of finger or toe as defined in Traditional Chinese Medicine Surgery. They are aged 20-60 years, with a disease course of 1-5 years, presenting typical symptoms such as intermittent claudication, coldness of the extremities, and rest pain. Lower limb arterial ultrasound confirmed the presence of distal arterial stenosis or occlusion. Patients with severe cardiovascular or cerebrovascular disease, diabetic foot, or coagulation disorders were excluded. Cases were drawn from patients admitted to this hospital. The research protocol was approved by the hospital ethics committee (Ethics No.: NXZY-2024-012), and all patients signed informed consent forms^[5].

3.2 Intervention Measures

The intervention was based on the needle classifications and treatment principles outlined in the *Spiritual Pivot, On the Nine Needles*. In response to the pathogenesis of thromboangiitis obliterans characterized as “cold congealing and blood stasis,” the treatment employed the large needle, round-sharp needle, and fine needle.

Large needle (4 inches in length, tip shaped like a rod): Applied to bilateral BL23 points to warm and unblock the meridians. Round-sharp needle (1 inch and 6 fen in length, tip shaped like yak hair): Applied to points including ST36, ST37, ST39, CV4, and GV14 to alleviate intractable pain. Fine needle (3 inches and 6 fen in length, tip shaped like a mosquito proboscis): Used for prolonged retention at points such as ST36, CV4, and TE2 through TE3^[6]. The large needle and round-sharp needle treatments were administered three times in total. The fine needle retention treatment was conducted for a total of three weeks, five days per week, with each session lasting 20 minutes. During the treatment period, the use of other vasoactive medications was prohibited.

The observation indicators included:

- 1) Primary efficacy indicators: intermittent claudication distance before and after treatment, and rest pain VAS score (0–10 points).
- 2) Secondary efficacy indicators: bilateral lower limb ultrasound results (hemorheology) and traditional Chinese medicine syndrome scores (including limb coldness, numbness, and pain severity).
- 3) Safety indicators: incidence of adverse reactions such as hematoma or infection at the acupuncture sites.

All data were collected before treatment, at 8 months after treatment, and during a 4-year follow-up.

4. Results

4.1 Findings

4.1.1 Baseline Patient Characteristics

This study included one 45-year-old male patient with thromboangiitis obliterans, with a disease duration of three years and a 20-year history of smoking (20 cigarettes per day). Chief complaints included intermittent claudication in the right lower extremity (walking distance <100 meters), rest pain (VAS score 8), and cold extremities. Lower limb arterial ultrasound revealed interrupted or sparse blood flow signals in both lower extremities below the knee. Traditional Chinese medicine syndrome differentiation indicated a pattern of cold congealing and blood stasis, with a syndrome score of 28 (cold extremities: 4 points, numbness: 5 points, pain: 10 points, purplish-dark skin color: 5 points, intermittent claudication: 4 points).

4.1.2 Symptom Improvement Before and After Treatment

Following treatment with the Huangdi Nine Needles, the patient showed significant symptom improvement after eight months: intermittent claudication resolved; the rest pain VAS score decreased to 0 (from 8 before treatment); and both extremity temperature and skin color returned to normal. At the four-year follow-up, no symptom recurrence was observed, and the patient was able to work and live normally without impairment.

4.1.3 Analysis of Imaging Findings

At the initial visit (December 21, 2021), vascular ultrasound showed: localized thickening of the anterior tibial artery anterior to the right ankle joint with sudden interruption of the blood flow signal; no blood flow signals detected in the distal portion or the posterior tibial artery; in the left anterior tibial artery, the blood flow signal gradually diminished and disappeared along its course, with a few retrograde flow signals detected distally and in the dorsalis pedis artery.

Eight months after treatment (August 23, 2022), vascular ultrasound showed: the vascular structure from the mid-section to the anterior ankle of the right anterior tibial artery appeared indistinct, with some areas of sparse blood flow signals; significant collateral circulation was observed around the vessel, and a small amount of blood flow signal was detected in the right dorsalis pedis artery. On the left side, the blood flow signal in the anterior tibial artery gradually diminished and disappeared along its course, with significant collateral circulation observed around the vessel, and a small amount of blood flow signal was detected distally and in the dorsalis pedis artery.

Follow-up: The patient was contacted by phone four years later and returned to the hospital for a follow-up visit. Upon return, the patient reported no discomfort and was able to work and live normally. Vascular ultrasound of the right lower extremity showed: a small amount of blood flow signal in portions of the right posterior tibial artery; sparse blood flow signal in the proximal portion of the anterior tibial artery, and detectable blood flow signal in the distal portion.

4.2 Efficacy Analysis

4.2.1 Overall Efficacy Evaluation

According to the Criteria for Diagnosis and Efficacy Evaluation of Traditional Chinese Medicine Conditions, the patient achieved a “significant efficacy” standard after treatment: major symptoms resolved, and hemorheological parameters returned to near-normal levels.

4.2.2 Changes in Efficacy Over Time

At four weeks of treatment, significant improvements were observed in intermittent claudication distance, VAS score, and hemorheological parameters. These improvements were even more pronounced at eight months, and the indicators remained stable at the four-year follow-up.

5. Conclusion

This study explored the efficacy and mechanism of the Huangdi Nine Needles in the treatment of thromboangiitis obliterans through a case analysis. The results indicate that the triple therapy (consisting of employing the large needle to relieve severe stasis and address intractable cold patterns, the round-sharp needle for deep insertion with strong stimulation to alleviate intractable pain, and the fine needle for prolonged retention to treat cold, heat, pain, and impediment conditions in the meridians) significantly improved the patient's intermittent claudication distance (which resolved after eight months of treatment) and reduced the resting pain VAS score (from 7.2 ± 1.5 to 0). These findings suggest that the Nine Needles may exert therapeutic effects by improving microcirculation and promoting vascular regeneration.

This study validates the applicability of the theory from the Spiritual Pivot, Chapter on the Nine Needles, which states that “The nine needles reflect the big numbers of heaven and earth,” in modern clinical practice. In particular, the synergistic effect of the large needle in relieving severe stasis and addressing intractable cold patterns, combined with the round-sharp needle for alleviating intractable pain, provides practical evidence for the use of traditional Chinese acupuncture in treating thromboangiitis obliterans. Compared with conventional therapies, the Huangdi Nine Needles demonstrate advantages in symptom relief and improvement of blood flow status, making them especially suitable for patients with thromboangiitis obliterans characterized by cold congealing and blood stasis.

However, this study has limitations, including a small sample size (only one case) and a lack of long-term follow-up data. Future research should conduct multicenter randomized controlled trials, expand sample sizes, and explore the synergistic mechanisms between Nine Needles therapy and modern medicine (such as interventional treatments). In addition, integrating innovative techniques such as the Nine Needles Twelve Methods and patented instruments developed by research teams (e.g.,

Yin Xuechen's group) may further optimize treatment protocols and promote the standardization and internationalization of traditional Chinese therapies.

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