

LEECH THERAPY AS AN ADJUNCT TO AYURVEDIC MANAGEMENT OF PERIPHERAL VASCULAR DISEASE (GAMBHIRA VATARAKTA) AND GANGRENOUS FOOT: A CASE REPORT

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ABSTRACT

Introduction: Peripheral arterial disease (PAD) is a manifestation of systemic atherosclerotic vascular disease in which impaired arterial perfusion of the lower extremities may progress to ischemic tissue injury, ulceration, and gangrene. In the Ayurvedic framework, the clinical phenotype of peripheral vascular disease may be interpreted within the spectrum of Vatarakta, particularly when the manifestations suggest involvement of both Vata and Rakta with obstruction of normal vascular pathways. **Case Presentation:** The present case report describes a 67-year-old woman with hypertension who presented with blackish discolouration of both lower limbs, blister formation followed by ulceration of the left foot, and progressive gangrenous changes over the plantar aspect of the foot. The case was clinically diagnosed as peripheral vascular disease with ischemic gangrenous changes and correlated with Gambhira Vatarakta. **Intervention:** Jalaukavacharana was administered locally over the affected limb as an adjunct to

Ayurvedic internal and local therapies. According to the case record, treatment was performed once weekly for three months, comprising 12 sittings, with regular wound assessment and continuation of the prescribed Ayurvedic medicines. **Outcome:** During the treatment period, progressive development of healthy granulation tissue, reduction in

unhealthy tissue, improved local tissue viability, and clinical improvement in peripheral circulation were observed, without further progression of gangrenous changes. **Conclusion:** These findings suggest a potentially useful adjunctive role for Jalaukavacharana in selected patients; however, they do not establish reversal of arterial obstruction or efficacy attributable to Jalaukavacharana alone. Objective post-treatment vascular assessment, standardized wound measures, and controlled clinical studies are required to clarify its therapeutic role.

KEYWORDS: Leech therapy, Gambhira Vatarakta, peripheral vascular disease, gangrene, Raktamokshana.

INTRODUCTION

Peripheral arterial disease is a chronic arterial disorder characterized by stenosis or occlusion of arteries supplying the lower extremities, most commonly due to atherosclerosis. It is associated with substantial cardiovascular morbidity, functional limitation, tissue loss, and risk of amputation. Contemporary guidelines recognize chronic limb-threatening ischemia as an advanced clinical presentation of PAD characterized by ischemic rest pain, nonhealing wounds, or gangrene, and emphasize objective vascular assessment, multidisciplinary care, wound management, risk-factor modification, and timely revascularization when indicated.^[1] Recent Indian consensus recommendations similarly emphasize clinical assessment, peripheral pulse examination, ankle-brachial index and duplex ultrasonography, together with aggressive management of cardiovascular risk factors and limb-preservation strategies.^[2]

In the present case, the use of the term peripheral vascular disease refers to the clinically documented arterial disorder affecting the lower limb. The Ayurvedic interpretation is not intended to imply that PAD and Vatarakta are identical disease entities. Rather, the correlation is based on overlapping clinical manifestations and an Ayurvedic perspective on the underlying pathophysiological process. Classical descriptions of Vatarakta emphasize the interaction of Vata and Rakta and describe both superficial and deeper manifestations, including discolouration, pain, oedema, sensory abnormalities, and ulcerative changes.^[3,4]

Charaka Samhita describes Raktamokshana as one of the therapeutic approaches in Vatarakta and specifically mentions Jalauka among the methods of bloodletting, selected according to the Dosha predominance and strength of the patient.^[5] Sushruta Samhita provides a detailed account of Jalaukavacharana, including selection, application, after-care, and the therapeutic rationale for using leeches as a comparatively gentle method of bloodletting.^[6] These

classical principles provide the Ayurvedic rationale for considering Jalaukavacharana as an adjunctive intervention in selected presentations involving Rakta Dushti.

Modern literature provides a possible biological framework for some effects of medicinal leech therapy. Leech saliva contains several bioactive molecules, including hirudin, calin, destabilase, bdellins and eglins, with reported anticoagulant, antiplatelet, anti-inflammatory, vasodilatory and analgesic activities.^[7] A 2024 systematic review of clinical trials found evidence of benefit across several heterogeneous conditions but also emphasized complications and the need for appropriate precautions.⁸ Importantly, the available literature does not establish medicinal leech therapy as a substitute for evidence-based vascular evaluation or revascularization in limb-threatening arterial disease.

CASE REPORT

Patient Information and Clinical History

January 2026 (1 Month Before Hospital visit)

She developed blackish discolouration of the left lower limb. Subsequently, blister formation occurred over the left foot, which progressed to ulceration. The condition gradually progressed with the development of gangrenous changes over the plantar aspect of the left foot.

February 17, 2026 (On the day of Hospital visit)

- **Event:** Patient presents to the Panchakarma Outpatient Department (OPD) at the Institute of Post Graduate Ayurvedic Education & Research (IPGAER), Kolkata.
- **Patient Profile:** 67-year-old married woman, housewife from a middle socio-economic background.
- **Physical Examination:** Obese, 62 kg, height – 5 feet 2 inches, dark complexion, presenting with anxious facies.
- **Medical History Confirmed:** Patient was moderate hypertensive (on conservative management), no history of diabetes or any drug abuse.
- **Family History:** Both parents had a history of hypertension and are deceased.
- **Addiction:** No such
- **Marital History:** Married for 42 years

Baseline Findings**General examination****Table 1.**

Respiratory rate	18/min
Temperature	Normal
Anaemia	present
Jaundice	Not present
Clubbing	Not present
Oedema	Present on both lower limb
Mental state	Conscious

Cardiovascular and Peripheral Vascular Examination**Table 2.**

Parameter	Remarks
Heart rate	88 beats/min
Rhythm	Regular rhythm
Blood pressure	142/96 mm Hg
Heart sounds	S1 and S2 – audible
Cardiac murmur	No murmur assumed
Femoral pulse	Feeble on the left side, Palpable on the right side
Popliteal pulse	Feeble on the left side, Palpable on the right side
Posterior tibial pulse	Impalpable on the left side, Palpable on the right side
Dorsalis pedis pulse	Impalpable on left side, Palpable on the right side
Peripheral temperature	Relatively cooler on left limb
Peripheral oedema	Bilateral pedal oedema present
Skin colour/discoloration	More severe involvement on the left
Ulcer/gangrene	Left-sided tissue destruction with exposed underlying structures

Laboratory and Diagnostic Findings

Baseline investigations and vascular evaluation were performed to assess the patient's haematological status and peripheral circulation.

Haematological investigations (18.02.2026)**Table 3.**

Parameter	Result	Interpretation
Haemoglobin (Hb)	8.4 g/dL	Decreased; indicates anaemia
Erythrocyte count (RBC)	3.14 million/cu.mm	Decreased
Packed Cell Volume (PCV/Hct)	26.9%	Decreased
Mean Corpuscular Volume (MCV)	85.67 fL	Within normal range; normocytic indices
Mean Corpuscular	26.75 pg	Mildly decreased

Haemoglobin (MCH)		
Total Leukocyte Count (TLC)	8,060/cu.mm	Within normal limits
Neutrophils	77%	Upper-normal/mildly increased proportion
Lymphocytes	18%	Relatively reduced proportion
Bleeding time	2 min 03 sec	Both within the laboratory reference range
Clotting time	4 min 06 sec	
Overall interpretation	—	Anaemic

Colour Doppler study of the left lower limb (18.02.2026)

Venous Doppler examination revealed mild incompetence at the left saphenofemoral and saphenopopliteal junctions. The deep veins showed mild delayed monophasic flow towards the heart with respiratory variation. Mild augmentation response was observed on calf compression. A tiny echogenic thrombotic focus with small incompetent perforators was noted over the medial aspect of the deep veins of the left lower limb below the knee. Mild subcutaneous oedema was present throughout the left lower limb.

Arterial Doppler demonstrated mild intima-media thickening with slightly reduced arterial calibre. The arterial waveform showed a reduced triphasic pattern with low-amplitude monophasic flow, spectral broadening and window filling, along with evidence of mild luminal obstruction below the knee. Digital arterial flow velocity was reduced in the left foot. Grade I atherosclerotic involvement was noted, with no aneurysmal dilatation.

The peak systolic velocities recorded were

- Left femoral vascular – 18.1 cm/sec
- Left popliteal vascular – 14.2 cm/sec
- Left anterior tibial vascular – 13.2 cm/sec
- Left posterior tibial vascular – 10.8 cm/sec
- Left dorsalis pedis vascular – 9.2 cm/sec

Diagnostic Assessment

Overall, the vascular findings were suggestive of mild peripheral arterial insufficiency with below knee arterial obstruction, reduced distal arterial flow, early atherosclerotic changes, associated venous incompetence and mild lower limb oedema. These findings supported the clinical diagnosis of Peripheral Vascular Disease (PVD) with ischemic gangrenous changes of the left foot. From an Ayurvedic perspective, the presentation was clinically correlated with Gambhira Vatarakta. The correlation was based on the presence of blackish

discolouration, swelling, tissue injury, ulceration and impaired peripheral circulation, interpreted in relation to the classical Vata–Rakta pathological framework. Such a correlation should be understood as a clinical and conceptual mapping rather than a claim of diagnostic equivalence.

The vascular evaluation documented in the case materials demonstrated compromised peripheral arterial flow with below-knee involvement and reduced distal arterial velocities. The baseline dorsalis pedis peak systolic velocity was reported as 9.2 cm/s, with reduced arterial waveform characteristics and early atherosclerotic changes. Because a repeat vascular Doppler study was not available after the treatment course in the detailed case record, subsequent improvement should be reported as clinical improvement rather than objective reversal of arterial obstruction.

Therapeutic Intervention

Jalaukavacharana was incorporated as an adjunct to Ayurvedic management rather than used as an isolated intervention. The latest treatment protocol documented in the presentation specifies application over the affected left lower limb, once weekly for three months, for a total of 12 sittings. Local wound status and peripheral circulation were assessed periodically during treatment. Internal Ayurvedic medicines and local wound-care measures were continued concurrently according to the documented treatment plan.

Table 4.

Date	Therapeutic Intervention
21.02.2026	Leech therapy (Jalaukavacharana) was applied on the affected part of the left lower limb
28.02.2026	
07.03.2026	
14.03.2026	
21.03.2026	
28.03.2026	
04.04.2026	
11.04.2026	
18.04.2026	
25.04.2026	
02.05.2026	
09.05.2026	

Table 5.

Medicine	Dosage	Frequency
Amrutottaram Kashayam	15ml	BDAC
Mahamanjisthadi Kashayam	15ml	BDAC
Amalaki (50 gm) Guduchi (50 gm) Yasthimadhu (30 gm) Praval Bhashma (10 gm) Yasad Bhashma (2gm)	3gm	BDAC
Panchabalkal Kashaya Aragwadhadi Kashaya	Local application	BD
Shatadhouta Ghrita	Local application	BD

From an Ayurvedic standpoint, the intervention was intended to address the Rakta component of the disease process through Raktamokshana, while the accompanying Shamana and local measures were intended to support Dosha balance, tissue condition and wound management. The present report does not permit determination of the independent contribution of any individual medicine or procedure.

CLINICAL COURSE AND OUTCOME

At baseline, the affected left foot showed marked blackish discoloration, a gangrenous plantar wound, reduced peripheral circulation and bilateral lower-limb swelling. During weeks 1–4, Jalaukavacharana was performed weekly with continued clinical monitoring. During weeks 5–8, progressive improvement of the wound and development of healthy granulation tissue were documented. During weeks 9–12, further granulation, progressive filling of the gangrenous area, improvement in clinically assessed circulation and reduction in local tissue damage were noted. No further progression of the gangrenous changes was documented.

The overall clinical course was characterized by progressive improvement in wound-bed appearance and tissue viability. These observations are clinically encouraging, but because the patient received combined interventions and objective post-treatment vascular imaging was not available, the findings should not be interpreted as evidence that Jalaukavacharana alone restored arterial patency.



Image 1: Onset (before treatment).



Image -2



Image -3



Image -4

Image -2, Image -3, Image -4 – During treatment (1-4 week)



Image -5



Image – 6

Image -5, Image -6 – During treatment (5-8 week)



Image -7



Image – 8



Image - 9

Image -7, Image -8, Image 9 – During treatment (9-12 week)

**Image -10****Image -11****Image -10, Image -11 – After treatment (after 12 weeks)**

DISCUSSION

The clinical presentation in this case represents a severe local manifestation of peripheral vascular disease, with tissue loss and gangrenous change. Current vascular guidelines classify gangrene or nonhealing tissue loss persisting beyond two weeks in the setting of PAD within the spectrum of chronic limb-threatening ischemia and recommend objective perfusion assessment, multidisciplinary evaluation, wound care and consideration of revascularization to preserve the limb. Accordingly, Ayurvedic intervention in such patients should be viewed as complementary and should not delay appropriate vascular assessment or limb-salvage measures.

The Ayurvedic interpretation of the case rests primarily on the Vatarakta framework. Classical descriptions emphasize the pathological interaction of Vata and Rakta and the development of obstruction and tissue manifestations. Charaka specifically describes bloodletting with Jalauka among the therapeutic options in Vatarakta, selected according to the clinical context and patient strength. The uploaded Ayurvedic literature review similarly discusses Vatarakta, Avarana, Sira-Dhamani Vikara and Vrana as possible conceptual frameworks for understanding different peripheral vascular presentations, while emphasizing the need for contemporary diagnostic evaluation.

The probable biological effects of Jalaukavacharana require careful wording. Medicinal leech saliva contains multiple pharmacologically active substances. Hirudin is a potent thrombin inhibitor, while other salivary constituents have antiplatelet, anti-inflammatory and vasodilatory properties. These mechanisms provide a plausible explanation for local effects on bleeding, venous congestion and microcirculatory dynamics in selected clinical settings. However, extrapolating these effects to restoration of arterial patency in atherosclerotic PAD would be inappropriate without objective vascular evidence. The current case therefore

supports, at most, a hypothesis that Jalaukavacharana may contribute to local tissue recovery when integrated into a broader treatment strategy.

An important strength of the case is the clinically documented progression of the wound from an unhealthy, gangrenous appearance toward a more viable wound bed with healthy granulation tissue. Similar clinical observations have been reported in Ayurvedic case literature involving peripheral vascular disorders, although the evidence remains dominated by case reports and heterogeneous multimodal interventions. A 2024 systematic review of clinical trials of leech therapy also reported benefits across several conditions but did not establish a specific evidence base for gangrenous atherosclerotic PAD. Thus, the present case is better positioned as a hypothesis-generating observation than as evidence of treatment efficacy.

Internal medications were administered as supportive Shamana therapy, with the therapeutic intent of addressing the presumed Dosha–Dushya involvement, particularly Vata and Rakta, and supporting systemic homeostasis. Mahamanjisthadi Kashayam was selected for its traditional application in disorders involving Rakta dushti, while Amrutottaram Kashayam and the Amalaki–Guduchi–Yashtimadhu-based formulation were used as systemic supportive therapies. Panchabalkal Kashaya and Aragwadhadi Kashaya were applied locally as part of wound care, with the intended objectives of local cleansing and support of wound healing. Shatadhouta Ghrita was applied locally for its traditionally described cooling, soothing and wound-supportive properties. These medications were administered concomitantly with Jalaukavacharana; therefore, the clinical outcome cannot be attributed to Jalaukavacharana alone.

Probable Mode of Action of Jalaukavacharana

The proposed mechanism may be conceptualized at three levels. First, from the Ayurvedic perspective, Jalaukavacharana constitutes Raktamokshana and may be considered relevant to the Rakta component of Vatarakta. Second, locally applied leeches produce controlled blood removal and prolonged post bite bleeding. Third, salivary bioactive molecules have anticoagulant, antiplatelet, anti inflammatory and vasodilatory effects that may influence local microcirculatory conditions. These mechanisms remain plausible rather than proven explanations for the outcome in this individual patient.

LIMITATIONS

- This is a single-patient case report and therefore cannot establish efficacy or generalizability.
- Multiple Ayurvedic interventions were administered concurrently; consequently, the specific contribution of Jalaukavacharana cannot be separated from the effects of internal medicines and local wound care.
- Post-treatment vascular Doppler or other objective perfusion measurements were not done yet; therefore, improvement in arterial patency cannot be claimed.

CONCLUSION

Jalaukavacharana, when integrated with Ayurvedic internal and local management, was associated with progressive clinical improvement in this patient with peripheral vascular disease and gangrenous changes clinically correlated with Gambhira Vatarakta. The most notable observations were improved wound-bed quality, development of healthy granulation tissue, improved local tissue viability and absence of further documented progression of gangrene. These findings support further investigation of Jalaukavacharana as a potential adjunctive intervention, but they do not establish restoration of arterial patency or superiority over standard vascular care. Future prospective studies should incorporate objective perfusion measures, standardized wound-healing outcomes, adverse-event monitoring, appropriate controls and longer follow-up.

PATIENT'S PERSPECTIVE

The patient described the condition of her left foot as distressing and significantly affecting her daily activities and mobility. At the beginning of treatment, the extensive blackish discoloration and gangrenous changes of the foot were a major concern. She underwent regular wound care along with Ayurvedic internal medications and Jalaukavacharana. During the course of treatment, she observed gradual improvement in the appearance of the affected foot, with progressive reduction of the gangrenous area and development of healthy granulation tissue. The progressive improvement in the wound condition increased her confidence in the treatment and provided relief from the fear of further deterioration and possible loss of the limb.

INFORMED CONSENT

Informed consent was obtained from the patient.

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