

Therapeutic Effectiveness of *Irsal-i-Alaq* (Hirudotherapy) for Venous Ulcer Treatment: A Clinical Case Study

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Citation: Parvez Ahmed, S. Nizamudeen, Madiha Anjum M and Mohammed Ashraf Ali S (2025). Therapeutic Effectiveness of *Irsal-i-Alaq* (Hirudotherapy) for Venous Ulcer Treatment: A Clinical Case Study. *Acta Traditional Medicine*.

DOI: <https://doi.org/10.51470/ATM.2025.4.2.07>

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11 April 2025: Received | 12 May 2025: Revised | 16 June 2025: Accepted | 17 July 2025: Available Online

ABSTRACT

Venous ulcers, commonly referred to as Stasis ulcers, represent a prevalent and recurring form of lower extremity ulceration that may substantially compromise patient quality of life when inadequately managed. Traditional therapeutic strategies frequently incorporate surgical procedures accompanied by inherent risks and potential complications. The present case study investigates the therapeutic potential of *Irsal-i-Alaq*, a traditional Unani therapeutic approach utilizing Hirudotherapy, for venous ulcer management. A 37-year-old male patient presenting with a chronic venous ulcer on the left lower extremity underwent leech therapy treatment spanning 6 weeks. Assessment parameters evaluated on a weekly basis included ulcer dimensions, granulation tissue development, epithelial regeneration, pain levels, wound exudate, and odor characteristics. The findings reveal substantial ulcer improvement, culminating in complete wound healing by the conclusion of the sixth week. This clinical case demonstrates the therapeutic promise of *Irsal-i-Alaq* as a viable treatment approach for venous ulcerations. Nevertheless, expanded studies incorporating larger patient cohorts and more stringent research methodologies remain essential for comprehensive validation of these observations.

Keywords: Venous ulcers, *Irsal-i-Alaq*, Hirudotherapy, Unani regimen therapy

Introduction

Venous ulcerations represent chronic, non-healing wounds of the lower extremities that constitute a prevalent clinical manifestation of chronic venous insufficiency. In the absence of appropriate therapeutic intervention, these ulcerative lesions may precipitate severe complications, including secondary bacterial infections and compromised patient mobility [1]. Venous leg ulcers (VLUs) function as late-stage clinical indicators of chronic venous insufficiency (CVI) and venous hypertension. Under normal physiological conditions, calf muscle pump mechanisms and competent intraluminal venous valves facilitate antegrade venous flow while preventing retrograde blood circulation. However, when venous reflux, vascular obstruction, or combined pathophysiology develops, chronic venous hypertension initiates the cascade of dermatological and vascular complications culminating in VLU formation (See Image. Venous Leg Ulcer) [2].

The three principal categories of lower extremity ulcerative pathology comprise venous, arterial, and neuropathic etiologies. Venous ulcerations constitute the majority of lower extremity ulcerative conditions, whereas pedal ulcerations demonstrate greater association with arterial insufficiency or neuropathic pathophysiology¹. Venous disease accounts for approximately 80% of lower extremity ulcerations, with arterial pathology contributing 10% to 25%, frequently presenting as coexistent conditions. The incidence of arterial insufficiency demonstrates an anticipated upward trajectory correlating with population aging demographics. Varicose vein prevalence reaches 30% in the general population, with significantly elevated incidence rates observed in geriatric cohorts [3].

Varicose vein distribution demonstrates global prevalence with variations attributed to activity levels and lifestyle determinants.

Gender-based epidemiological data reveals higher prevalence rates in females compared to males. The Framingham Study conducted longitudinal surveillance of varicose vein development through biennial assessments over 16 years. Data analysis revealed varicose vein development in 23% and 30% of male and female participants, respectively, during the study period. Venous reflux assessment was not incorporated into the study protocol. The biennial incidence rate for varicose veins measured 39.4 to 51.9 per 1000 population. Peak incidence occurred in females during the fourth decade of life. Ethnic correlations demonstrate significant associations with varicose vein prevalence, with Asian populations exhibiting lower rates of chronic venous insufficiency and varicose veins compared to non-Hispanic white populations [4].

The majority of venous ulcerations localize to the medial malleolar region, with remaining cases distributed across alternative lower extremity and pedal locations. Varicose veins represent the primary clinical manifestation of chronic venous insufficiency, although recently characterized acute lipodermatosclerosis may precede varicosity development. Varicose vein morphology ranges from submalleolar venous flares to progressive degrees of vessel dilatation. Additional progressive manifestations of chronic venous insufficiency include reddish-brown hyperpigmentation and purpura secondary to erythrocyte extravasation into dermal tissue, hemosiderin deposition within macrophages, and melanin accumulation. Eczematous changes characterized by erythema, desquamation, pruritus, and occasional exudation, clinically designated as venous dermatitis, frequently accompany these pathological changes [5].

Historical documentation of varicose veins originates from the Eber's papyrus circa 1550 BC. Hippocrates established the initial clinical correlation between varicose veins and ulcerative

complications. Ancient physicians including Galen, Celsus, Aetius of Aminda, and Pauls Aegien advocated avulsion and cauterization techniques for varicose vein management while implementing compression bandaging for leg ulcer treatment. Medical practitioners from the 10th through 18th centuries attributed lower extremity ulceration to the pathological accumulation of black bile and menstrual blood [6].

Leech saliva contains bioactive compounds demonstrating vasodilatory, anticoagulant, anesthetic, thrombolytic, antimicrobial, analgesic, and anti-inflammatory pharmacological properties. Historical medical applications utilized leeches for localized bloodletting procedures dating to ancient Greek, Roman, and Arabian medical practices. Initial Greek medical literature referenced leech therapy through Themison (80-40 B.C.), a disciple of Asclepiades from the pre-Christian era. Within Indian traditional medicine, *H. granulosa* species demonstrates established therapeutic efficacy. The pathogenesis of varicose vein symptomatology correlates with the accumulation of pathological humoral substances in lower extremity tissues. Unani medical practitioners have employed bloodletting therapeutic modalities since antiquity for varicose

vein prevention and clinical management [7]. Conventional therapeutic approaches frequently incorporate surgical interventions, which may demonstrate variable efficacy and associated procedural complications. In contrast, Unani medical systems provide alternative therapeutic modalities including Irsal-i-Alaq, or Hirudotherapy, involving the clinical application of medicinal leeches to affected anatomical regions⁸. This case study aims to evaluate the clinical efficacy of Irsal-i-Alaq in venous ulcer management.

Case Presentation

A 37-year-old male individual sought medical consultation at the outpatient facility of the Postgraduate Department of Ilaj Bit Tadbeer, Government Unani Medical College, Chennai, India, for evaluation of a persistent venous ulcer affecting the left lower limb. The ulcer demonstrated medial malleolar localization with accompanying clinical features of regional swelling, pain symptomatology, non-suppurative discharge, and hyperpigmented changes in the adjacent dermal tissue. Prior therapeutic management attempts had failed to achieve meaningful clinical resolution.

Table 1: Clinical Wound Evaluation Parameters

Assessment Parameter	Baseline (Day 0)	Week 2	Week 3	Week 4	Week 6
Lower Extremity Discomfort/Ambulation Pain	2	1	1	1	0
Circumferential Limb Measurements (cm)					
• Limb Girth	39	37	36	36	35
• Ankle circumference	31	30	29	28	27
• Pedal circumference	27	26	24	23	22
Cutaneous Pigmentation Assessment:					
• Pigmentation grade	3	3	3	2	2
• Affected surface area (cm ²)	800	500	360	255	180
Ulcerative Lesion Evaluation:					
• Ulcer-associated pain scale	2	2	1	1	0
• Exudate characteristics	Serous	Serous	Absent	Absent	Absent
• Ulcer depth measurement (cm ²)	2	1.5	1	0.5	0
• Periwound induration area (cm ²)	72	42	25	16	0
• PUSH Score assessment	16	13	11	10	0
• Undermining/tunneling/sinus tract formation	None	None	None	None	None
Color Flow Doppler Evaluation					
• Saphenofemoral junction (SFJ)	Incompetent	Competent	-	-	-
• Saphenopopliteal junction (SPJ)	Incompetent	Competent	-	-	-
• Incompetent perforating veins	11	0	-	-	-

Intervention

Therapeutic management was implemented through Irsal-i-Alaq, incorporating systematic medicinal leech application with proper SOPs to the affected ulcerative region. The established treatment regimen involved dual leech placement targeting the left medial malleolar area, with biweekly administration frequency during the first 14-day period, followed by weekly therapeutic sessions throughout the subsequent 28-day treatment phase. Comprehensive clinical evaluations were conducted at 7-day intervals to assess treatment efficacy and document key clinical parameters, encompassing wound surface area analysis, healthy granulation tissue presence, epithelialization progress percentage, ulcer depth quantification, pain severity measurement (employing Visual Analog Scale assessment), discharge characterization, olfactory evaluation, and wound enumeration.



Fig. 1 - Day 1 - 1st Week



Fig. 2 - 2nd Week



Fig. 3 - 3rd Week



Fig. 4 - 4th Week



Fig. 5 - 5th Week



Fig. 6 - 6th Week

Table 2: Clinical Assessment Criteria for Ulcerative Lesion Evaluation

Clinical Parameters	Grade			
	Grade 0	Grade + (1)	Grade ++ (2)	Grade +++ (3)
Ulcer Dimensions	Intact integumentary continuity	25% reduction from baseline ulcer area	50% reduction from baseline ulcer area	>50% reduction from baseline ulcer area
Pain Assessment	Absence of pain sensation	Localized discomfort during ambulation, resolving at rest	Persistent localized pain during rest periods	Continuous localized pain with contralateral radiation
Exudate Production	Absence of discharge/Dry wound dressing	Minimal, intermittent exudate/Slightly moist dressing	Moderate exudate requiring daily dressing changes	Profuse, continuous drainage necessitating frequent dressing changes
Olfactory Assessment	Absence of odor	Mild malodorous characteristics	Moderately unpleasant, tolerable odor	Severe, intolerable foul odor
Wound Margin Characteristics	Well-approximated edges	Smooth, uniform, and regular margins	Irregular, rough marginal borders	Inflamed, erythematous appearance
Ulcer Base Assessment	Smooth, regular with healthy granulation tissue/Minimal dressing requirements	Irregular surface with moderate exudate, reduced granulation tissue/Standard dressing protocol	Compromised tissue with minimal granulation/Daily dressing requirements	Devitalized tissue with absent granulation tissue

Table 3: Longitudinal Clinical Assessment of Ulcerative Lesion Parameters Following Therapeutic Intervention

Clinical Parameters	Pre-treatment Baseline	Post-treatment Assessment Timeline						
		Day 1	Week 2	Week 3	Week 4	Week 5	Week 6	
Ulcer Dimensions	+++	+++	++	+	-	-	-	-
Pain Intensity	++	++	+	-	-	-	-	-
Wound Margin Status	++	++	+	+	-	-	-	-
Ulcer Base Condition	++	++	+	+	+	-	-	-
Exudate Production	++	++	+	-	-	-	-	-
Olfactory Characteristics	++	+	-	-	-	-	-	-

Results

Initial clinical assessment revealed ulcer measurements of 4 cm in length, 3 cm in width, and 2 cm in depth. The ulcer base exhibited devitalized granulation tissue with characteristic dark pigmentation, accompanied by absence of epithelialization, exudation, pain symptoms, and olfactory manifestations. Systematic clinical improvement was observed during the 6-week therapeutic course, demonstrating progressive wound size reduction, increased healthy granulation tissue proliferation, and resolution of pain and discharge parameters. Complete ulcer resolution was accomplished at the sixth week endpoint, with total epithelial regeneration of 100%.

Before treatment

After treatment



Fig.1: Venous leg ulcer

Fig. 6: Healed venous leg ulcer

Doppler study Reports
Before After

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Doppler Study of Limb Venous System (Rt / Lt Both)									
Veins	Lumen (Patent / Thrombosed / recanalized)		Compressibility		Phasic Variations		Reflexion		
	Right	Left	Right	Left	Right	Left	Right	Left	
Common femoral									
Superficial femoral									
Popliteal									
Post. Tibial proximal									
Post. Tibial distal									
Ant. Tibial proximal									
Ant. Tibial distal									
Superficial And Deep Venous Junctions									
Rt Saphenofemoral Junction		Competent / Incompetent		Reflex grade					
Lt Saphenofemoral Junction		Competent / Incompetent		Reflex grade					
Perforators		Right (Competent / Incompetent)		Left (Competent / Incompetent)					
Above Knee									
Above ankle									
Below Knee									
Lateral Mid-Calf									
Other Findings (if any):									

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6/11/18

Satish Kumar

5/7/18

Doppler Study of Limb Venous System (Rt / Lt Both)

Veins	Lumen (Patent / thrombosed / recanalized)		Compressibility		Phasic Variations		Augmentation	
	Right	Left	Right	Left	Right	Left	Right	Left
Common femoral								
Superficial femoral	Patent	Patent	Patent	Patent	Patent	Patent	Patent	Patent
Popliteal								
Post. Tibial proximal								
Post. Tibial distal								
Ant. Tibial proximal								
Ant. Tibial distal								

Superficial And Deep Venous Junctions

Rt Saphenofemoral Junction

Competent / Incompetent

Reflex grade

Lt Saphenofemoral Junction

Competent / Incompetent

Reflex grade

Perforators	Right (Competent / Incompetent)	Left (Competent / Incompetent)
Above Knee		
Above ankle		
Below Knee		
Lateral Mid-Calf		

Other Findings (if any):

4/2/18 5/7/18 DTT

Impression:

1. Lt. Venous system is study.

left Saphenofemoral Junction Incompetent Normal Study

Discussion

The successful outcome of this case study suggests that Irsal-i-Alaq may be an effective treatment modality for venous ulcers. Hirudotherapy is believed to exert its therapeutic effects through various mechanisms, including improved blood circulation, reduction of inflammation, and promotion of tissue regeneration [9]. The application of medicinal leeches may facilitate the removal of stagnant blood and toxins from the ulcer site, thereby promoting wound healing. However, further research is needed to elucidate the underlying mechanisms and determine the optimal treatment regimen for venous ulcers [10]. This case exhibited complete healing of the ulcer. In the perspective of venous stasis, the underlying mechanisms of pain involve the activation of nociceptors and the accumulation of algogenic metabolites at the site of the microcirculatory units. Endothelial cells in these areas are particularly sensitive to such metabolites [11]. When a leech attaches to the skin, it engulfs stagnated blood, thereby alleviating mechanical pressure. Additionally, the leech's salivary secretions, which include anticoagulants, thrombolytics, vasodilators, and anesthetics, are delivered through a pumping action [12].

The anticoagulants and thrombolytics present in leech saliva extend the duration of bleeding, leading to hypovolemic hemodilution, which consequently lowers blood pressure and facilitates the removal of metabolites from the microcirculatory units. Concurrently, the anesthetic agents in the saliva reduce local pain. Furthermore, a reduction in limb girth, indicative of decreased edema, was observed. The biochemical components of leech saliva contribute to the reduction of stasis and blood pooling by prolonging bleeding through their anticoagulant, antithrombotic, and vasodilatory effects [13]. Pigmented lesions observed in stasis dermatitis result from the deposition of hemosiderin in the dermis. Hemosiderin arises from the breakdown of hemoglobin within the cytoplasm of phagocytic cells, which occurs alongside post-inflammatory pigmentation that leads to pigment incontinence. The presence of dermal hemosiderin has a stimulatory effect on melanogenesis, further contributing to the observed pigmentation changes.

Conclusion

These findings suggest that Irsal-i-Alaq represents a therapeutically sound intervention for venous ulcer treatment, as substantiated by the successful clinical resolution observed in this case report. However, large-scale randomized controlled investigations with prolonged observation periods remain imperative to confirm these initial observations and define the clinical positioning of Hirudotherapy within venous ulcer management algorithms. Despite these research requirements, the clinical outcomes presented in this case study emphasize the therapeutic value of Unani medicinal approaches as effective adjunctive interventions for chronic ulcerative conditions, facilitating a comprehensive, multidisciplinary approach to wound healing.

Reference

1. Krizanova O, Penesova A, Hokynkova A, Pokorna A, Samadian A, Babula P. Chronic venous insufficiency and venous leg ulcers: Aetiology, on the pathophysiology-based treatment. *International Wound Journal*. 2024 Feb;21(2):e14405.
2. Robles-Tenorio A, Lev-Tov H, Ocampo-Candiani J. Venous Leg Ulcer. [Updated 2022 Sep 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-
3. Shadrina AS, Elgaeva EE, Stanaway IB, Jarvik GP, Namjou B, Wei WQ, Glessner J, Hakonarson H, Suri P, Tsepilov YA. Mendelian randomization analysis of plasma levels of CD209 and MICB proteins and the risk of varicose veins of lower extremities. *PLoS One*. 2022;17(5):e0268725.
4. Ahmed WU, Kleeman S, Ng M, Wang W, Auton A, 23andMe Research Team. Lee R, Handa A, Zondervan KT, Wiberg A, Furniss D. Genome-wide association analysis and replication in 810,625 individuals with varicose veins. *Nat Commun*. 2022 Jun 02;13(1):3065.
5. sabel C. Valencia, MD, Anna Falabella, MD, Robert S. Kirsner, MD, and William H. Eaglstein, MD Miami, Florida Chronic venous insufficiency and venous leg ulceration *J AM ACAD DERMATOL* MARCH 2001
6. Minhaj Ahmad¹ and Abdul Nasir² * MANAGEMENT OF VENOUS LEG ULCER THROUGH UNANI MEDICINE ALONG WITH LEECH THERAPY-A CASE STUDY *World Journal of Pharmaceutical Research* SJIF Impact Factor 8.074 Volume 7, Issue 14, 836-844. ol, 2018
7. zarnigar, md. anwar alam Clinical Efficacy of Leech Therapy In Varicose Ulcer-A Case Series tahaffuzi wa samaji tib (psm), niium, Bangalore Phcog.Net | www.unanires.org/Jan2011/Vol1/Issue1
8. Mir RA, Nayab M, Mir UY, Ansari AN. Preventive and Therapeutic values of Leech Therapy: A Review. *Journal of Drug Delivery and Therapeutics*. 2024 Aug 15;14(8):183-9.
9. Baglioni EA, Perego F, Paolin E, Abate A, Pusceddu T, Zavan B, Bocchiotti MA. Efficacy of autologous micrografts technology: a promising approach for chronic wound healing and tissue regeneration—a pilot study. *Frontiers in Medicine*. 2024 Jul 26;11:1417920.
10. Srinidhi R, Raveenthiran V. Tropical Phagedenic Ulcer. (venous ulcer studies)
11. (Giamberardino, M. A. (Ed.). (2009). *Visceral pain: clinical, pathophysiological and therapeutic aspects*. Oxford University Press.).
12. Rajput H. Basic Imperative Leech Therapy.
13. Marchiori CH, de Oliveira Santana MV, de Paula Malheiros K. Leeches and Their Use in Medicine (Annelida: Hirudinea: Rhynchobdelliformes).