

CASE STUDY

Integrative Ayurved Approach to Diabetic Foot Ulcer Management: The Role of Leech Oil and Leech Therapy

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ABSTRACT

Diabetic Foot Ulcer (DFU) is one of the most prevalent diabetic-related complications that can cause infection and sometimes require amputation. This Case study describes the effectiveness of Ayurved management in a 56-year-old male patient with Diabetic foot ulcers treated with ayurved medicine internally, external leech oil dressing, and jalaukavacharana (medicinal leech therapy). After 26 days, 90% of the size of ulcers was found to decrease significantly with the integrative treatment approach utilized in this study. These findings highlight the promise of Ayurved as an adjunctive modality in the management of chronic diabetic ulcers.

Keywords: Diabetic Foot Ulcer, Ayurved, Leech Therapy, Wound Healing, Panchvalkal Kwatha, Jalaukavacharana, Kapha-Pitta Imbalance, Rakta Mokshana, Internal Medications, Traditional Medicine.

Received 14.10.2025

Revised 26.11.2025

Accepted 01.01.2026

How to cite this article:

Ridham U, Hemant D T, Harish D, Sahil P. Integrative Ayurved Approach to Diabetic Foot Ulcer Management: The Role of Leech Oil and Leech Therapy. Adv. Biores. Vol 17[1] January 2026. 132-136

INTRODUCTION

Foot infections are the most common problem in persons with Diabetes¹. These individuals are predisposed to foot infections because of a compressed vascular supply due to Diabetes. Local trauma and pressure, in addition to micro vascular disease, may result in a variety of diabetic foot infections.² Diabetic Foot Ulcer represents a critical complication related with Diabetes Mellitus, leads in expanded hospitalization, increased chance of contaminations, and the possibility of amputations. Traditional treatment fundamentally concentrates on diabetes treatment, wound management, infection prevention, and improving blood circulation; however, chronic diabetic foot ulcer mostly delays or unable to heal.³ Ayurved, an ancient science of medicine, offers an elective methodology by focusing on the basic causes of the condition through the balance of doshas, purification, and restoration treatments. This case study details the Ayurved treatment of a 56-year-old male patient suffering from a chronic Diabetic Foot Ulcer which did not respond to ordinary treatments. The integrative approach utilized medicine, the application of leech oil externally at wound site and medicinal leech therapy, resulting in significant healing advance.

CASE REPORT

A 56-year-old male patient with having co-morbidity Type 2 Diabetes Mellitus (T2DM) presented with a non-healing ulcer on his left great toe, since for five months at shalya outpatient department, Parul Ayurved Hospital. The ulcer, classified as Grade III in Wagner's classification, was associated with mild to moderate pain, pus discharge, and difficulty walking. Patient took four months of conservative wound care at home and oral hypoglycemic medicine (Glimepiride 1mg + Metformin 500mg twice daily) which prescribed by his physician, but the ulcer not healed and starting worsen at ulcer site. The patient was advised to undergo amputation, which he refused and opting instead for Ayurvedic treatment.

EXAMINATION

Local Examination

- **Location:** Posterior aspect of the 5th metatarsophalangeal joint of the left foot toe
- **Size:** 2.2 cm × 2.8 cm
- **Shape:** Spherical
- **Discharge:** Pus discharge present
- **Odor:** Present
- **Floor:** Mild slough
- **Margin:** Poorly defined, mild necrotic
- **Edge:** Sloping
- **Base:** Muscle
- **Surrounding Skin:** Edematous and thickened with blackish discoloration
- **Tenderness:** Present
- **Pulsation:** Dorsalis pedis and posterior tibial artery well appreciated
- **Peripheral Sensation:** Completely lost

Systemic Examination:

- **Respiratory System:** Air entry bilateral equal and clear
- **Cardiovascular System:** S1 S2 heard
- **Central Nervous System:** Well conscious and well oriented to time, place, and date

Hematological Investigation Reports:

- **HbA1c (Till November 2024):** 10.1%
- **Estimated Average Glucose:** 242 mg/dL
- **Other Investigations (RFT, LFT, and TFT):** Normal

The prognosis of the patient's condition was explained, and informed consent was obtained. Subsequently, an Ayurvedic treatment plan was initiated and thoroughly explained to the patient.

TREATMENT METHODOLOGY

Internal Ayurved Medications

The treatment focused on correcting **Vata-Kapha imbalances** and improving **circulation** through herbal formulations:

Mamejava Ghanavati was administered in a dosage of two tablets three times a day (TDS) before food with warm water. It was selected for its anti-inflammatory properties, ability to enhance peripheral circulation, and supportive role in wound healing, particularly in diabetic conditions.⁴ Gandhaka Rasayana was given in a dose of two tablets twice daily (BD) after food with warm water.⁵ This poly-herbomineral formulation, with purified Gandhaka (sulfur) as its principal component, is known for its broad-spectrum antimicrobial activity and helps in controlling infection while promoting tissue repair.⁶ Nisha Amalaki Churna was prescribed in a dose of one tablespoon early in the morning on an empty stomach. It possesses significant anti-hyperglycemic and anti-diabetic properties along with antioxidant, insulin-mimetic, α -amylase inhibitory, and α -glycosidase inhibitory actions, thereby aiding in glycemic control essential for wound healing.⁷ Aarogyavardhini Vati was administered at a dosage of two tablets three times a day (TDS) after food with warm water. This formulation supports blood detoxification, improves digestive and metabolic functions, and accelerates tissue regeneration, contributing to systemic correction and faster healing of the diabetic foot ulcer.⁸

External Ayurved Applications

- **Leech Oil (Jalauka Taila):** Prepared by infusing medicinal leeches in sesame oil. The oil enhances circulation, reduces swelling, and promotes healing.
- **Panchvalkal Kwatha⁹:** A decoction with antimicrobial and regenerative properties used for wound cleansing that is dhavan karma and prakshalana karma.
- **Pathya-apathya¹⁰:** Dietary restrictions included avoiding fermented foods, bakery items, and dairy (except cow ghee). The patient was advised against excessive exertion, stress, and barefoot walking.
- **Leech Therapy (Jalaukavacharana)**

Leech therapy was performed twice during treatment, each session lasting 30-45 minutes.¹¹ Medicinal leeches release bioactive substances like hirudin, which improve blood circulation, reduce swelling, and accelerate wound healing. The therapy facilitated Rakta Mokshana (blood purification) and enhanced local tissue oxygenation.



Figure 1: Jalaukaavcharana in Diabetic Foot Ulcer

Preparation of Leech Oil (Jalauka Taila)

Ingredients:

- Dried leech powder (prepared from medicinal leeches)
- Triphala Kwatha (decoction): Used for purification
- Til Taila (Sesame Oil): Acts as a base oil
- Water: For preparing the Triphala Kwatha

Method of Preparation

- Leech Purification: Leeches were soaked in Triphala Kwatha for 3-4 hours and then sun-dried for 2-3 days.
- Infusion Process: Dried leeches were added to sesame oil and simmered for 7-10 days.
- Straining and Storage: The infused oil was filtered and stored in an airtight container

Pharmacological Properties

Dried leech powder retains the bioactive compounds found in live leeches, making it useful for various medical applications:

- Hirudin: A potent anticoagulant that prevents blood clot formation.
- Bdellin & Eglin: Anti-inflammatory proteins that help in reducing pain and swelling.
- Hyaluronidase: Enhances tissue permeability, aiding in wound healing and skin penetration.
- Antimicrobial Peptides: Prevent bacterial and fungal infections, making leech powder useful for dermatological applications.¹²

RESULT

After 26 days of continuous Ayurvedic management, the patient showed marked clinical improvement in the diabetic foot ulcer. Approximately 90% reduction in ulcer size was observed, with a significant decrease in depth and surface area of the wound. The ulcer floor, which initially showed mild slough and necrotic tissue, became clean with the development of healthy granulation tissue, indicating active wound healing. Pus discharge and foul odor completely subsided, suggesting effective control of local infection. The surrounding edema and blackish discoloration reduced considerably, and the patient reported a notable reduction in pain and tenderness, resulting in improved comfort during walking. No adverse

reactions were noted during internal medication, external applications, or leech therapy. Overall, the integrative Ayurvedic approach demonstrated a positive therapeutic outcome in promoting wound healing and preventing disease progression in this chronic diabetic foot ulcer.

DISCUSSION



Figure 2: phase of ulcer healing day wise

Chronic diabetic foot ulcers are characterized by impaired angiogenesis, neuropathy, infection, and sustained inflammation. Conventional therapies often fail due to persistent microvascular compromise. In this case, the integrative Ayurvedic approach addressed both systemic pathology (hyperglycemia, inflammation) and local pathology (ischemia, infection). Leech therapy played a crucial role by improving microcirculation and oxygen delivery, while Panchavalkal Kwatha and Gandhaka Rasayana controlled local infection. Internal medications supported metabolic balance and immune modulation. Classical Ayurvedic texts describe Madhumehajanya Vrana as difficult to treat, yet emphasize Rakta Mokshana and Shodhana therapies—principles validated by the observed clinical outcome.¹³

The findings align with earlier Ayurvedic case reports and experimental studies on leech therapy and herbal formulations, supporting their adjunctive role in chronic wound management.

CONCLUSION

This case study demonstrates that Ayurvedic interventions, including leech therapy, leech oil, and herbal medications, can significantly aid DFU healing. The integrative approach corrected dosha imbalances, improved circulation, and accelerated wound healing. Given these promising results, further clinical studies should explore the broader applicability of Ayurveda in DFU management.

REFERENCES

1. Chawla NK, Chawla R, Kaur J, Kaur A. (2024). Diabetic Foot Ulcer: An Ayurvedic Approach for Prevention and Treatment. *Journal of Ayurveda and Herbal Medicine*. 10(2):32–36. DOI: 10.31254/jahm.2024.10202
2. Toshikhane HD, Chauhan J, Daga H. (2021). Leech – A Walking Needle as a Wound Healer. In: [Book/Proceedings title if applicable]. Page no. 55.
3. Indu PP. (2021). Diabetic Foot Ulcer – An Ayurvedic Perspective. *World Journal of Pharmaceutical and Medical Research*. 7
4. Shubhashree MN, Das B, Nanda GC, Swamy GK, Ota S, Doddamani S, Rao MM, Tewari V, Sharma BS, Khanduri S, Rana R, Singhal R, Kumar A, Srikanth N. (2019). Efficacy and safety of Mamajjaka Ghanavati in the treatment of type 2 diabetes mellitus: a prospective open label multi-center clinical study. *Clin Trials Degener Dis*. 9;4(1):7-13. doi: 10.4103/2542-3975.254106
5. Mitra S, Prajapati PK, Shukla VJ, Ravishankar B. (2010). Impact of Bhavana Samskara on Physico-Chemical Parameters with Special Reference to Gandhaka Rasayana Prepared by Different Media and Methods. *AYU*. 31:382–386. DOI: 10.4103/0974-8520.77155

6. Saokar RM, Sarashetti RS, Kanthi V, Savkar M, Nagthan CV. (2013). Screening of Antibacterial and Antifungal Activity of Gandhaka Rasayana—*An Ayurvedic Formulation*. *International Journal of Recent Trends in Science and Technology*. 8:134–137.
7. Mahabdi PP, Agey KN, Prajapati D, BJ Patgiri, Review of research work done on Nishamalaki in type 2 Diabetes at institute of Teaching and Research in Ayurveda, Jamnagar. *J Ayu Int Med Sci*. 2024;9(8):190-195. DOI:10.21760/jaims.9.8.29
8. Padhar, B. C., Dave, A. R., & Goyal, M. (2019). Clinical study of Arogyavardhini compound and lifestyle modification in management of metabolic syndrome: A double-blind placebo controlled randomized clinical trial. *Ayu*, 40(3), 171–178. https://doi.org/10.4103/ayu.AYU_79_19
9. Sonekar A, More YB, Sonekar R. (2015). Clinical Evaluation of Panchavalkal Kashaya Dhavana in the Management of Diabetic Wound. *Ayurlog: National Journal of Research in Ayurved Science*. 3(3):131–139.
10. Bopparathi S, K V NR. (2023). Diabetic foot ulcer with osteomyelitis, successfully treated with the holistic approach of multiple ayurvedic treatment modalities - A case report. *Int J Surg Case Rep*. 107:108315. doi: 10.1016/j.ijscr.2023.108315. Epub 2023 May 12. PMID: 37207585; PMCID: PMC10206147.
11. Michalsen A, Klotz S, Lüdtke R, Moebus S, Spahn G, Dobos GJ. (2003). Effectiveness of leech therapy in osteoarthritis of the knee: a randomized, controlled trial. *Ann Intern Med*.v 4;139(9):724-30. doi: 10.7326/0003-4819-139-9-200311040-00006. PMID: 14597456.
12. Baskova IP, et al. 2011. Medical Leech Therapy: Biologically Active Substances and Clinical Applications. *Journal of Applied Biomedicine*. 9(4):185–191.
13. Acharya YT (Ed.). (2005). *Sushruta Samhita*. Varanasi: Chaukhambha Surbharati Prakashana. p. 93.

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