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HEALING WITH HIRUDOTHERAPY: A CASE STUDY ON LEECH APPLICATION IN VARICOSE ULCERS

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Abstract

Varicose ulcers are wounds that arise due to the malfunctioning of venous valves, predominantly in the legs. These ulcers represent the most severe and debilitating manifestation of chronic venous insufficiency in the lower extremities, accounting for 80 percent of leg ulcer cases. The morbidity associated with varicose ulcers significantly impacts quality of life. Chronic venous hypertension, resulting from venous insufficiency, is a key factor leading to ulcer formation. Management strategies for venous ulcers encompass conservative care, mechanical interventions, pharmacological treatments, and surgical options. The objective of this study is to assess the impact of leech therapy on a 55-year-old male patient who visited surgical OPD at HSZH Unani Medical Hospital. The patient complained of pain, swelling, an infected wound on the lateral aspect of his left lower leg, skin discoloration, and serous discharge from the wound, persisting for two years. He was admitted and received leech therapy across multiple sessions. As a result, his signs and symptoms improved by 90%, providing significant relief. This case study underscores the potential advantages of leech therapy in the treatment of varicose ulcers, proposing it as a valuable adjunctive treatment option.

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1. Introduction

Varicose ulcer

Venous ulcers are persistent wounds that commonly develop on the skin and cause significant discomfort. They constitute 80 percent of all lower limb ulcers [1]. These ulcers can also arise from vascular insufficiency, extended pressure, diabetic neuropathy, and systemic diseases such as rheumatoid arthritis, vasculitis, osteomyelitis, and skin cancer [2]. They are more commonly found in women and the elderly [3–5].

These ulcers have a high recurrence rate and can remain open for anywhere from several weeks to many years. Serious complications may include cellulitis, osteomyelitis [6], and malignant changes [3]. Although these complications are relatively rare, the chronic nature of venous ulcers increases the risk of morbidity and mortality, significantly diminishing the patient's quality of life [7,8].

Leech and Leech therapy

Leeches are carnivorous, blood-sucking annelid worms[9,10]. India is home to approximately 45 species of leeches, categorized into 22 genera. One notable species, *Hirudinaria granulosa*, is known for its therapeutic properties. Leeches can either bite or puncture the skin using their proboscis to draw blood. This process is similar to a mosquito bite due to the release of a histamine-like substance, making it painless. Additionally, leech saliva contains an anesthetic to prevent the patient from feeling the bite. The saliva also includes a compound that inhibits blood coagulation. However, the anesthetic effects of a leech bite can be influenced by factors such as cold skin, smoking, or aging.

Managing varicose ulcers remains challenging and often requires a multimodal approach, despite advancements in wound care. Recently, there has been renewed interest in the ancient practice of leech therapy for wound healing [11]. Leech therapy, known as hirudotherapy, is considered highly effective and safe for managing varicose ulcers [12].

In the Unani medicinal system, leech therapy or *Irsal-e-Alaq* [13], involves using medicinal leeches to both prevent and treat various diseases. Historically, *Hirudo medicinalis* were employed in early modern and medieval medicine to draw blood from patients in an effort to balance the "biological humours". Unani medicine identifies four humours—phlegm, yellow bile, black bile, and blood—as fundamental to its medical philosophy. Balancing these humours is seen as crucial to maintaining health and treating ailments in traditional Arabian medicine.

2 Case Description

Patient Details

- **Age**: 55 years
- **Gender**: Male

- **Religion**: Muslim
- **Occupation**: Businessman
- **Diet**: Both vegetarian and non-vegetarian

Chief Complaints and Duration

- **Issues**: Pain and swelling in the left lower leg, infected wound on the lateral aspect of the left lower leg, skin discoloration, and serous discharge from the wound.
- **Duration:** 2 years

Brief Medical History

The patient has experienced the aforementioned symptoms for the past two years. Initial treatment at a private clinic was unsuccessful, as the wound became infected and failed to heal despite ongoing care. Consequently, he sought further treatment at HSZH Unani Medical Hospital, Bhopal, M.P. There was no history of diabetes, hypertension, asthma, tuberculosis, heart disease, or any other major illnesses [14,15]. Additionally, there was no record of previous surgeries.

General Examination (Day 1)

- **Vital Parameters**: All within normal limits
- **Hemodynamic Status**: Stable

Laboratory Findings

- **Hemoglobin (Hb)**: 12.5 mg/dL
- **White Blood Cell (WBC) Count**: 8000/cu mm of blood
- **Random Blood Sugar Level (RBSL)**: 120 mg/dL
- **Erythrocyte Sedimentation Rate (ESR)**: 12 mm/hour
- **Viral Markers**: Negative
- **Coagulation Profile**: Normal

Imaging Studies

- **Arterial and Venous Color Doppler**: Multiple incompetent perforators observed in the lower limb; competent saphenofemoral (SF) and femoropopliteal (FP) valves; no evidence of deep vein thrombosis (DVT) or ischemia.

Local Examination (Day 1)

- **Site of Ulcer**: Lateral aspect of the left lower limb
- **Size of Ulcer**: 4×3×0.5 cm
- **Shape**: Oval
- **Smell**: Foul smell present
- **Discharge**: Present
- **Hyperpigmentation**: Present
- **Epithelialization**: Present
- **Granulation Tissue**: Present
- **Edges**: Fibrosed, sloping
- **Ankle Flare**: Positive
- **Local Temperature**: Normal
- **Arterial Pulsation**: Dorsalis pedis and posterior tibial pulses are normal

Diagnosis

- Non-healing varicose ulcer

Treatment Plan

Initial Wound Care:

- The wound was washed with normal saline.
- Leech therapy was applied around the lesion.
- After approximately 30 minutes, when the leech detached naturally, the wound was cleaned with:
    - Boiled neem water
    - Honey water
    - Finally, unripe mashed papaya was placed on the wound.

Dressing Schedule:

- Dressing was done every other day.
- Leech therapy was repeated weekly for a total of four sessions.

Oral Medications:

- Unani formulations including *Habb-e-Musaffi Khoon, Arq-e-Murakkab Musaffi Khoon,* and *Majoon Ushba* were administered.

Treatment Duration:

- Total treatment duration was 30 days.

Assessment Schedule:

- Assessments were conducted on Day 01, Day 07, Day 14, Day 21, and Day 30.
- Changes observed during the treatment period were noted based on specific assessment criteria.

3. Observation Parameter and Schedule

The patient's progress was closely monitored over a period of five weeks, focusing on several key parameters. These included the presence of ankle flare, peripheral hyperpigmentation, and the size of the ulcer, the development of granulation tissues, and the level of pain relief experienced by the patient. Each week, thorough assessments were conducted to track changes and improvements in these areas, ensuring a comprehensive evaluation of the treatment's effectiveness.

Table 1 - Observation Parameter

Parameters	Grade			
Ankle flare	Base line 100%	3=75%	2=50%	1=25%
Peripheral Hyper pigmentation	Base line 100%	3=75%	2=50%	1=25%
Size of Ulcer (cm)	Base line100%	3=75%	2=50%	1=25%
Granulation Tissue	Base line 0%	1=25%	2=50%	3=75%
Pain	Base line 100%	3=75%	2=50%	1=25%

Table 2 - Progressive Report

	Parameter				
	Ankle flare	**Peripheral Hyper-pigmentation**	**Size of Ulcer (cm)**	**Granulation Tissue**	**Pain**
1st week	Base line 100%	Baseline 100%	Base line 100%	Base line 0%	Base line 100 %
2nd week	50%	75%	75%	25%	75%
3rd week	25%	50%	50%	50%	25%
4th week	0%	50%	5%	5%	25%
5th week	0%	25%	0%	0%	0%

4. Results

With the implementation of leech therapy and adjuvant management, the patient's wound completely healed within 30 days, effectively curing the non-healing ulcer. The images taken during and after the treatment support this outcome.

Day 7 Prognostic Evaluation

Day 14 Prognostic Evaluation

Day 21 Prognostic Evaluation

Day 28 Prognostic Evaluation

Probable Mechanism of Action of Leech Therapy

Correction of Venous Hypertension: Leech application helps correct venous hypertension and reduce vascular congestion. This effect is due to the presence of carboxypeptidase A inhibitors, histamine-like substances, and acetylcholine in the leech's saliva. These components help address venous valve dysfunction and manage extra vascular fluid perfusion,preventing the leakage of proteins and the isolation of extracellular matrix molecules and growth factors. This process aids in wound healing.

Peripheral Vasodilation: The saliva of leeches contains vasodilator constituents that have a peripheral vasodilator effect, improving blood circulation around the wound. This enhanced blood flow corrects ischemia in the wound area, thereby promoting the healing process.

Anti-inflammatory Action: Leech saliva contains substances like bdellins and eglins that have anti-inflammatory properties. These substances prevent the accumulation of leukocytes in the surrounding vessels, inhibiting the release of inflammatory factors that contribute to chronic wound formation. This anti-inflammatory action supports wound healing by reducing inflammation.

5. Conclusion

With "Leech therapy", the non- healing Varicose ulcer completely healed within 30 days. Because of the presence of anticoagulant, thrombolytic, vasodilating, anti-inflammatory, blood thinning, lymph flow accelerating and
venous pressure reducing substances in the saliva of leech varicosity of leg cures. Thus, leech therapy proves to be efficient, cost effective, safe, time- saving, widely acceptable, promising and highly significant treatment with
positive results in the varicose vein. None of the complications like severe bleeding, wound infection or hypersensitivity were observed during the therapy. "Leech Therapy" proves to be effective, time saving, affordable and
acceptable treatment. A multi centric comparative clinical trial along with valvular studies is needed to establish this unique treatment protocol.

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