



Case Study

## JALAUKAVACHARANA (MEDICINAL LEECH THERAPY) AND JATYADI GHRITA IN DUSHTA VRANA W.S.R TO DIABETIC FOOT ULCER

Anjali<sup>1\*</sup>, Gaurav Parmar<sup>2</sup>

\*1MS Scholar, <sup>2</sup>AMO, Department of Shalya Tantra, RGGPG Ayurvedic College and Hospital, Paprola, HP, India.

### Article info

#### Article History:

Received: 05-10-2024

Accepted: 29-10-2024

Published: 20-11-2024

#### KEYWORDS:

*Jalaukaavacharna*,  
*Dushta Vrana*,  
*Jatyadi Ghrita*,  
Diabetic foot ulcer.

### ABSTRACT

*Ayurveda* describes a variety of therapeutic skills, including medicinal, surgical and parasurgical procedures. *Jalaukaavacharna* is a parasurgical procedure, focuses on removing contaminated blood to treat various conditions. *Sushruta Samhita* has devoted an entire chapter for the description of *Jalauka* and *Jalaukavacharna* in *Sutra Sthana* 13<sup>th</sup> *Adhyaya* and also described *Dushta Vrana* in *Vranasravavigyaniya Adhyaya*. The leeches draw out blood while simultaneously secreting substances that are considered beneficial for healing according to Ayurvedic principles. A 60 years old female patient freshly diagnosed with Type 2DM came to RGGPG Ayurvedic college and hospital, Paprola, Himachal Pradesh, with complaints of swelling over right greater toe with purulent discharge and foul smell since two month. After debridement, leech therapy followed by dressing with *Jatyadi Ghrita* done for three month, twice a week for first month, once a week for second month then after 15 days for next month. Limb elevation and strict diabetic management was advised.

### INTRODUCTION

*Raktamokshana*, a key parasurgical procedure in traditional medicine, focuses on removing contaminated blood to treat various conditions. It utilizes two primary techniques:

**1. Shastrakrita (Surgical Method):** This involves using surgical instruments, like knives or scalpels, to make incisions and remove contaminated blood directly.

**2. Ashastrakrita (Non-Surgical Method):** This technique employs tools or substances that do not involve cutting, such as leeches or medicinal plants, to draw out the impure blood.

*Sushruta Samhita* has devoted an entire chapter for the description of *Jalauka* and *Jalaukavacharna* in *Sutra Sthana* 13<sup>th</sup> *Adhyaya* and also described *Dushta Vrana* in *Vranasravavigyaniya Adhyaya*.

### Dushta Vrana

तत्रातिसंवृतोऽतिविवृतोऽतिकठिनोऽतिमृदुरुत्सन्नोऽवसन्नोऽतिशीतोऽत्युष्णः

कृष्णरक्तपीतशुक्लादीनां वर्णानामन्यतमवर्णो भैरवः  
पूतिपूयमांससिरास्नायुप्रभृतिभिः

पूर्णः पूतिपूयास्त्राव्युन्माग्युत्सङ्घमनोज्ञदर्शन- गन्धोऽत्यर्थं  
वेदनावान्

दाहपाकरागकण्डूशोफपिडकोप द्रुतोऽत्यर्थं दुष्टशोणितास्त्रावी  
दीर्घकालानुबन्धी दुष्टव्रणलिङ्गानि । (Su.Su 22/7)

The *Sushruta Samhita*, an ancient surgical text, describes *Dushta Vrana* as a severe wound with characteristics like an irregular opening, intense pain, and extensive discharge, which may be hot or cold to the touch. The surrounding tissue can be red, swollen, and affected by vesicles, with a base that is either excessively hard or soft and emitting a foul smell. The condition is marked by severe, burning pain and an unpleasant appearance.

*Acharya Sushruta* has mentioned *Raktamokshana* in *Dushta Vrana*

दुष्टव्रणेषु कर्तव्यमूर्ध्वं चाधश्च शोधनम् ।

विशोषणं तथा तथाऽऽहारःशोणितस्य च मोक्षणम् । (Su. Chi 2/87)

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<https://doi.org/10.47070/ayushdhara.v11i5.1776>

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*Dhanvantari* is depicted with a striking resemblance to *Vishnu*, featuring four arms. In one of his hands, he holds a leech, highlighting the historical significance of bloodletting. This depiction underscores the importance of the practice in Ayurveda. Alongside the leech, he typically holds a conch, a discus, and a pot of amrita. Other representations may show him with a conch, amrita, medicinal herbs, and an Ayurvedic text.

In December 1799, George Washington fell ill with throat pain and difficulty breathing. His doctors, following the medical practices of the time, performed multiple bloodlettings, removing nearly half of his blood volume. Despite these efforts and Washington's own request for more bloodletting, his condition worsened, and he died that night. At the time, bloodletting was a common medical treatment, reflecting the limited understanding of diseases and treatments of the late 18<sup>th</sup> century.

Ongoing research into leeches is exploring their properties, bioactive substances, mechanisms of action, breeding, and storage. This topic remains highly intriguing and detailed. Leeches produce over 20 identified bioactive substances, including Antistasin, Eglins, Gaumerin, Hirudin, Saratin, Bdelins, and inhibitors like Complement and Carboxypeptidase. These substances exhibit a range of functions such as anticoagulant, analgesic, anti-inflammatory, platelet inhibitory, thrombin regulatory, antimicrobial, and extracellular matrix degradative effects. While numerous proteins are found in leech secretions, only a few active substances have been extensively identified. The mechanisms of leech action are categorized into six types for clearer understanding: leech bites and subsequent sucking lead to extracellular matrix degradation, inhibition of adhesion, anticoagulant effects, increased blood flow, antimicrobial protection (through analgesic and anti-inflammatory effects).

Diabetic foot ulcers are a severe complication of diabetes mellitus, affecting about 15% of diabetic patients over their lifetime. This condition is characterized by a classic triad of neuropathy, ischemia, and infection.

Infection in a diabetic foot is particularly severe due to anatomical factors. The foot contains multiple interconnected compartments, allowing infections to spread easily. Additionally, the absence of pain in diabetic patients can lead to continued walking, which further facilitates infection spread.

Many drugs have been described for Wound healing in text. *Jatyadi Ghrita* is one of its kinds used for *Shodhana* and *Ropana* of *Vrana* which is described in *Ashtang Hridaya Uttara Tantra*.

जातीनिम्बपटोलपत्रकटुकादावीनिशासारिवा-  
मञ्जिष्ठाभयसिक्थतुल्यमधुकैर्नक्ताह्वबीजान्वितैः ।

सर्पिः साध्यमनेन सूक्ष्मवदना मर्माश्रिताः क्लेदिनो गम्भीराः सरुजो  
व्रणाः सगतयः शुद्ध्यन्ति रोहन्ति च (A.H.Uttara tantra 25/67)

### AIM AND OBJECTIVE

To evaluate the effect of *Jalaukaavacharana* (medicinal leech therapy) and *Jatyadi Ghrita* in *Dushta Vrana* w.s.r to diabetic foot ulcer.

### Clinical Technique

Leech therapy (*Jalaukaavacharna*) followed by dressing with *Jatyadi Ghrita*.

### Type of Study

Observational and interventional single case design without control group

### Study Centre

*Shalya Tantra* department, RGGPG Ayurvedic College and Hospital, Paprola.

### MATERIAL AND METHOD

The study was conducted in OPD 103 of the *Shalya* Department at Rajiv Gandhi Post Graduate Ayurvedic College, Paprola. The patient, who had freshly diagnosed with type 2 diabetes mellitus was diagnosed by the consultant with a diabetic foot ulcer. The patient was informed about the study, and written consent was obtained. Before starting the study, a comprehensive profile of haemogram, biochemical, and serological tests was conducted to assess clotting and bleeding times, blood glucose levels, anaemia, HIV status, HBsAG, among others.

Leeches for the treatment were sourced from a scientific supplier in Agra. They were kept in separate glass jars filled with water, labelled with information about whether they had been used and the name of the patient they were used on. During the study, one or two leeches were applied weekly to the non-healing ulcer. The same leech was used on the same patient unless it died, in which case it was replaced with a new one. Before leech therapy, careful debridement was performed to minimize tissue loss and ensure optimal wound hygiene.

### Case Report

A 60 years old female patient freshly diagnosed with Type 2DM came to RGGPG Ayurvedic College and Hospital, Paprola, Himachal Pradesh, with complaints of swelling over right greater toe with purulent discharge and foul smell since two month. Blood examination and X- ray right foot AP, oblique view was done followed by debridement of the wound. X-ray was done to rule out osteomyelitis. No evidence of osteomyelitis was present in the X-ray Patient admitted to female *Shalya* ward RGGPG Ayurvedic college and hospital Paprola, Himachal Pradesh.

**Treatment**

Debridement of the wound was done. After debridement, leech therapy followed by dressing with *Jatyadi Ghrita* done for three month, twice a week for first month, once a week for second month then after 15 days for next month. Limb elevation was advised with strict diabetic management.

**OBSERVATION AND RESULT**

**Wound Description:** Initially, the wound was irregular in shape with signs of infection, such as

discoloration, slough (dead tissue), swelling, purulent (pus-like) discharge, and an unpleasant odor.

**Effect of Leech Therapy**

After treatment, there was noticeable improvement: Healthy granulation tissue began to form, wound margins contracted healthily. Reduction in slough, discharge, smell, and discoloration.

**Leech Attachment:** The leech attached with a usually painless bite, sucking 8-15 ml of blood over 35 to 45 minutes.





## DISCUSSION

*Sushruta* referred to *Raktavisravana* in cases of *Dushtarakta*. *Jalaukavacharna*, a type of *Rakta Visravana*, is effective in removing *Dushta Rakta*, which is associated with various inflammatory conditions. In *Chikitsa Sthana Sadhyovrana Chikitsa Adhyaya*, *Sushruta* also mentioned *Raktamokshana* for treating *Prameha* and *Kushtha Dushta Vrana*. With advancements in science and technology, the mechanisms by which leech therapy works have become clearer. After a leech bite, the tissues and blood vessels allow enzymes like hyaluronidase and collagenase to take effect, while histamine-like molecules promote vasodilation and inhibit platelet aggregation. The therapeutic benefits are not derived from the blood removed during the bite, but rather from the leech's saliva, which contains anticoagulants and vasodilators. Leech saliva contains various bioactive substances, including hyaluronidase, which acts as a spreading factor with antibiotic properties, and hirudin, a potent anticoagulant that facilitates blood flow by inhibiting coagulation through its binding to thrombin. Destabilase breaks down fibrin and has thrombolytic effects. Bdelins provide anti-inflammatory benefits and inhibit enzymes like trypsin, plasmin, and acrocin. Acetylcholine functions as a vasodilator. Eglins are anti-inflammatory agents that inhibit the activity of alpha-chymotrypsin, chymase, elastase, subtilisin, and cathepsin G. Factor Xa inhibitors reduce the activity of coagulation factor Xa. Collagenase aids in the breakdown of collagen, while carboxypeptidase-A inhibitors help to increase blood flow. *Jatyadi Ghrita* is effective in *Vrana Shodhana* and *Ropana*

## CONCLUSION

Leech therapy, practiced by our *Acharyas* for centuries, is now gaining significant recognition due to its ability to address venous insufficiency, restore venous outflows, manage pain, and promote wound healing in both infected and non-infected chronic

wounds. *Jatyadi Ghrita* is effective in *Vrana Shodhana* and *Ropana*. A comprehensive study is needed to thoroughly evaluate the effects of leech therapy and *Jatyadi Ghrita* on wound healing.

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**Cite this article as:**

Anjali, Gaurav Parmar. Jalaukavacharana (Medicinal Leech Therapy) and Jatyadi Ghrita in Dushta Vrana w.s.r to Diabetic Foot Ulcer. AYUSHDHARA, 2024;11(5):119-123.

<https://doi.org/10.47070/ayushdhara.v11i5.1776>

**Source of support: Nil, Conflict of interest: None Declared**

**\*Address for correspondence**

**Dr. Anjali**

MS Scholar

Department of Shalya Tantra  
RGGPG Ayurvedic College and  
Hospital, Paprola, HP.

Email:

[thakuranjali0703@gmail.com](mailto:thakuranjali0703@gmail.com)

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