



# LEECH THERAPY AND IT'S SIGNIFICANCE IN SURGICAL PRACTICE

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**Abstract:** One of the oldest intellectual properties of human beings is the art of healing. This art originated out of need, constraint, the urge to help others and self protection. Ayurveda advocates, "Let the noxious blood be let out" it will cure the disease or otherwise it will make a clear pathway towards further treatment modalities. In Ayurvedic literature Raktamokshana is one of the most effective measure as a half treatment in Shalya Tantra, as Basti in Kayachikitsa. US Food and Drug Administration has approved Medicinal Leeches as a treatment for venous congestion in graft tissue to promote healing and can serve as a nonsurgical option for plastic surgery patients with concern for tissue compromise. Despite a wealth of documentation on medicinal leech therapy, proper indications, risks and use currently lacks an update<sup>[1]</sup>. The purpose of this article is to provide a platform for understanding the recent literature on Raktamokshana. Topics examined include basics of leeches, mode of action, indications in various diseases and results after application.

**Key Words:** leech, raktamokshana, plastic surgery, surgical practice, para surgical, Ayurveda.

## 1. AIM AND OBJECTIVES :

- To critically evaluate the role of leech therapy in current surgical practice.
- To study the mode of action, clinical applications and challenges associated.

## 2. METHODOLOGY :

**Search Strategy :** The literature of Ayurvedic Samhitas was thoroughly reviewed. A comprehensive literature search was conducted using Pubmed, Scopus and Google scholar databases to identify relevant articles. The search terms included "jalaukavcharna", "leech therapy" and "leech therapy in clinical practice".

**Study Selection :** The concept of "Jalaukavcharna" was studied and important references were collected from Ayurvedic Samhitas. Articles were screened based on titles and abstracts, followed by full text reviews.

**Limitations:** This review may be limited by the exclusion of non-English language studies and the potential for publication bias in the included literature.

## 3. INTRODUCTION :

### HISTORICAL OVERVIEW :

The use of leeches in Ayurvedic medicinal practice in India is very ancient. There are records of use of these for blood letting in early Greek medicine. In Europe hirudinea medicinalis was commonly used for phlebotomy in olden times the procedure was called as "leechery". In 1863 about 7 million leeches were used London hospitals and 5 to 6 million used in Paris hospitals. The famous English poet William Words worth (1802) wrote a poem "The Leech Gatherer"



based on medicinal use of leech. Leech therapy has a long history. Records indicate that Egyptians used leech therapy 3,500 years ago. Leech treatments were very popular during the middle ages. Again leech therapy became commonly practiced in the 1800's by American physicians treating a variety of diseases. In the 1980, medicinal leech therapy got a big boost by plastic surgeons that used leeches to relieve venous congestion, especially in transplant surgery.

### Description Of Leech [2]:

The word *Jalauka* is a compound word with two components Jala (Water) + Oka (Housing place) i.e. Animals having water as its residing place. Leeches are widely distributed and are found in fresh water ponds, lakes, tanks and slow streams and still water standing in rice fields. The best time for collecting leeches is Sharad Ritu.

### Classification Of Jalauka

<i>Savisha Jalauka</i> (Poisonous)	<i>Nirvisha Jalauka</i> (Non-poisonous)
1. <i>Krishna</i>	1. <i>Kapila</i>
2. <i>Karbura</i>	2. <i>Pingala</i>
3. <i>Algarda</i>	3. <i>Shankhumukhi</i>
4. <i>Indrayudha</i>	4. <i>Mooshika</i>
5. <i>Samudrika</i>	5. <i>Pundareekamukhi</i>
6. <i>Gochandana</i>	6. <i>Savarika</i>

Common Indian species are as follows :

- 1) *Hirudinaria granulosa*
- 2) *Hirudinaria viridis*
- 3) *Hirudinaria javanica*
- 4) *Hirudinaria manillensis*

The most common Indian cattle leech *Hirudinaria granulosa* is commonly used in medicinal uses for blood letting.

### Systematic position of leech by zoological knowledge

<b>Phylum</b>	– Annelida
<b>Class</b>	– Hirudinea
<b>Order</b>	– Gnathobdellida
<b>Family</b>	– Hirudinidae
<b>Genus</b>	– <i>Hirudinaria</i>
<b>Species</b>	– <i>granulosa</i>

### CHEMICAL CONSTITUENTS OF SALIVA

The leech produces a number of important substances which contribute to the special property of the bite, including an anticoagulant, a local vasodilator and local anesthetic. Like Hirudin, Hyaluronidase, Hementin etc.

### MODE OF ACTION

Here therapeutic effect is not only by suction of blood but also by the secretions which the leech injects into the lesion. They secrete anticoagulants to prevent blood clots and relieve pressure due to pooling blood. Leech saliva helps to re-establish blood flow to the body parts by means of a vasodilatation, produces a numbing effect by anesthetic action. These substances allow continued flow of blood normally up to 10 hours after it has detached.

Research indicates that after about 3 to 5 days, neovascularisation takes place around flap margins which sufficiently restore effective venous drainage. Therefore, it is important that treatment is not terminated too soon, but rather, continued over a period of time to avoid failure. The property of the leech bite cut to continue bleeding for 10 or more hours is related to pharmacologically active substances not the anticoagulant alone. The bite of the *Hirudo* is painless. Its anesthetic agent makes the bitten host to feel nothing.

A medicinal leech is a small "factory" to manufacture biologically active substances which has following actions. Normalization and improvement of capillary circulation.

- Expressed anti inflammation effect
- Anti stressful and adaptogenic effects

- Blood purification effect by expelling out the vitiated blood
- Immuno stimulation and immuno modulating effects
- Improvement of an endocellular exchange
- Early wound healing effect
- Reduces the blood viscosity
- Anesthesia
- Anticoagulation
- Antibacterial effect.

#### 4. INDICATIONS :

Piles, Varicose veins, Buerger's disease, Infected wounds, Inflammatory swellings, Acne vulgaris, Venous ulcers, Plastic surgery *Vidradhi, Daha, Udara, Visha, Visarpa, VranaShopha* etc.

#### LEECH THERAPY IN INFLAMED PILES <sup>[3]</sup>

Patient is in lithotomy position, the pile mass is rubbed with *Gomaya churna* or *Prachhana* with sterile needle to get a drop of blood from the *Arshankura*. Then apply the mouth of *Jalauka* near the pricked point and expands its mouth and sticks to the point. Wet gauze is covered over the *Jalauka* during sucking of impure blood in *Arshas*. Once the patient complains pain and itching over the site, it indicates the *Jalauka* is sucking of pure blood. *Jalauka* may fall down its own or if it doesn't leave the sucking, then apply *Saindhava lavana* or *Haridra* powder on its mouth.

*Jalauka* is having *Sheeta, Snigdha, Shlakshna guna, madhura rasa* and has *Pittahara* property for relieving of pain and swelling in inflamed piles.

**Anticoagulant effect** - Hirudine present in the leech saliva acts as an anticoagulant in addition to its clot dissolving and anti-platelet functions.

**Local Anaesthetic effect** - The leech saliva contains mild anaesthetic agent to relieving the pain in inflamed condition.

**Antibiotic** - Leech Hyaluronidase acid has powerful antibiotic property.

Leech saliva is supposed to have vasodilator and proteolytic inhibitory actions also.

#### LEECH THERAPY IN MUKHDUSHIKA (Acne Vulgaris)<sup>[4]</sup>

A 20 years old female patient presented in Shalya OPD in Government Ayurvedic Medical College & Hospital Akhnoor, Jammu, JK UT India with the complain of pimples on both cheeks associated with itching burning sensation for two years. Patient was subjected to *Jalaukavacharana* on both sides of cheeks of the face due to bilateral distribution of *pidakas*. *Jalaukavacharana* was done on Day 1, Day 3 and Day 7. Before and after treatment assessment was recorded. Patient was followed up for 30 days. This case presented with *vedana* (pain), *puya srava* (pus) and *shopha* (inflammation) along with *daha* (burning sensation) and *kandu* (localized itching). Three sittings of *Jalaukavacharana* were done (on Day 1, Day 3 and Day 7). Vitiated blood was sucked by the *jalauka* leading to the *sthanik shodana*, *Raktamokshana* using *Jalauka* provides a simple, painless, cost effective treatment for this common ailment with no short term side effects. The Procedure was done at GAMC & H Akhnoor Jammu, Shalya OPD.



Figure 1 : Patient Of Acne Vulgaris



Figure 2 : Vitiated Blood Sucked By *Jalauka*



### LEECH THERAPY IN *PITTAJA DUSHTA VRANA*<sup>[5]</sup>

*Jaloukavacharana* reduces Venous congestion, moistness of the wound, removes slough and facilitates the granulation in turn it helps for wound healing.

Proper management with timely *Jaloukavacharana* and dressings gradually reduces infection and facilitate wound healing.

### LEECH THERAPY IN BUERGER'S DISEASE / THROMBOANGITIS OBLITERANS<sup>[6]</sup>

- In case of TAO where the arterial insufficiency is the main cause for discoloration of wound site,
- This is improved probably because of Leech saliva content a anticoagulant, and hyaluronidase, which breaks down hyaluronic acid the bonding material of connective tissue, thus fastening the flow of blood and fluids from affected areas.
- So, *Jaloukavacharana* helps to re-establish blood flow to the site by means of a vasodilation.

### LEECH THERAPY IN VARICOSE VEINS<sup>[7]</sup>

- Where the veins becomes dilated, elongated & tortuous.
- Transmission of blood from Ankles to Heart against gravity in the veins normally takes place. Any incompetency in the valves becomes major cause for Varicose veins.
- Fibrinogen escapes through venules, accumulates, acts as a barrier to diffusion of oxygen, & other nutrients leading to skin changes.
- Stasis Dermatitis-Edema-Pigmentation- Fat necrosis -tissue death - Ulceration.
- The effectiveness of medicinal leech therapy in producing venous decongestion, reversal of edema, hyper pigmentation and healing of varicose ulcer.

### LEECH THERAPY IN INFLAMMATORY SWELLINGS

- It is an acute condition.
- Inflammatory edema may be compared to *Aganthu shotha*
- Has *Pitta*, *Raktha* and *khapa* as the predominant dosha.
- It is mainly found helpful in *Ama* and *Pachyamanawastha* of *Vranashotha*.
- *Vranashotha* with features of Pain, swelling, redness locally.

The active leech substances block the enzymic process activated and often exceeding within inflammation or traumas. The salivary glands of leeches have other pharmacologically active substance including an antihistaminic.

Antithrombin, antitripsin and antichymotripsin activities, protease and possibly, an anesthetic agent, were found in the salivary gland secretion and intestinal chyme of medicinal leech and reduce the pain.

### LEECH THERAPY IN PLASTIC SURGERY

- To remove the blood from post operative occlusions, thus reducing the frequency of necrosis.
- After microsurgery, if replanted piece of tissue or skin flap becomes engorged with blood, then leeches are used to drain until normal venous drainage can be established.
- They are used to save the skin- flap that becomes congested after Plastic surgery. .
- They also have been used extensively to restore circulation to fingers that have been re-attached surgically.

## 5. DISCUSSION :

Leech therapy, a treatment with ancient origins, has successfully transitioned into modern surgical practice, demonstrating its relevance and utility in a variety of clinical contexts. The evidence supporting the effectiveness of leech therapy in these settings is robust, with numerous studies documenting its success in preventing tissue necrosis and improving surgical outcomes. However, the application of leech therapy is not without challenges. The potential for adverse effects, such as infection or allergic reactions, necessitates careful patient selection and monitoring. Moreover, patient perception and acceptance of leech therapy can be a significant barrier, particularly in cultures or demographics where the idea of using live animals for medical treatment is met with resistance. Despite these challenges, leech therapy remains a valuable adjunct in modern surgical practice.



Future research should focus on several key areas. First, large-scale, randomized controlled trials are needed to better quantify the efficacy and safety of leech therapy across different surgical applications. Second, the development of guidelines for the use of leech therapy, tailored to specific surgical contexts, could standardize its application and optimize outcomes. Finally, exploring patient attitudes and the psychological aspects of leech therapy could provide insights into how to improve acceptance and adherence, which are crucial for the successful implementation of this treatment.

## 6. CONCLUSION:

Leech therapy is effectively used in almost all Pitta raktahjavikara which is practiced successfully even today. Leech Therapy has benefits locally as well as systematically by blood purification effect, by expelling out the vitiated blood, immuno-stimulation and immuno modulating effects, improvement of an endocellular exchange, early wound healing effect, reduces the blood viscosity, anesthesia, anticoagulation.

Good results have been obtained by practicing Leech Therapy in surgical diseases like-Piles, Varicose veins, Buerger's disease, Infected wounds, Inflammatory swellings, Abscess, Herpes zoster, Venous ulcers, Plastic surgery.

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