

नितिन गडकरी
NITIN GADKARI



मंत्री
सड़क परिवहन राजगण
एवं पोत परिवहन
भारत सरकार
MINISTER OF ROAD TRANSPORT
HIGHWAYS & SHIPPING
GOVERNMENT OF INDIA

Do No. 2302
Date 20 JUN 2016

Please find enclosed herewith a memorandum submitted by Dr Sunita S Hirlekar, Plot No. 6/4, Pandit Malviya Nagar, Khamla, Nagpur - 25, MS requesting for establishment of Leech Surgical Research Institute and Hospital at Nagpur, MS sponsored by AYUSH Department, GoI. The details about the project are attached for ready reference, which are self explanatory.

In the view of above, I am forwarding the same at your end for needful action abiding the guidelines and due verification.

With Regards !

Yours,

(Nitin Gadkari)

Shri Shripad Naik,
Hon'ble Minister of State for AYUSH(IC)
Government of India,
New Delhi.

To,

Shri Shripad Yesso Naik Mahodaya

Hon'ble Minister of State for AYUSH and Health & Family Welfare
Government of India, New Delhi 110023

Through,

Mr. Nitinji Gadkari Mahodaya

Hon'ble Minister of Road Transport, Highways & Shipping
Government of India
Parivahan Bhavan, New Delhi 110001

**Subject: Establishment of "Jallaukavacharan" Anusansthan Sansthan evam Rugnalaya
[Leech Surgical Research Institute and Hospital] at Nagpur.**

Respected Sir,

It is humbly submitted here for your kind information that Leech surgical procedure "Jallaukavacharan" is well explained in ancient Indian system of medicine, "Ayurveda". Researchers all over the world have also focused their concentration on the same and have work out several such research projects with fruitful result and are continuing several of the projects. Jallaukavacharan i.e. leech surgical procedure, where leech is used as a surgical instrument and is called as "Anushastra"; surgical/ parasurgical instrument which does not required anesthesia, instrumental sterilization, use of antibiotics and is without special pre and postoperative care, short duration of hospitalization; further it is to note here, that the incision by leech falls under the category of cosmetic incision. Jallaukavacharan has been reported in ancient Indian classical text, as well as modern researchers are also working on the same. It is extremely useful in most of the surgical diseases, such as fissures, hemorrhoids, varicose vein, thrombi phlebitis, arterial diseases, thrombosis, abscess, accidental wound, chronic wound/ ulcer gangrene, diabetic foot, and prevents their amputation and is the most economical procedure.

Sir, till date no special attention has been paid in this direction for research and propagation of such a wonderful surgical process. Therefore attention towards establishing Research Institute and Hospital for such a economic and effective Indigenous surgical procedure is requested. The project for the same is enclosed here with.

It is being proposed by the group of following research experts.

1. Dr. Sunita S. Hirlekar-Deo
PhD. M.D. Shalya-tantra,B.P.A.Drama
Prof. - Shalyatantra (since 18.7.1999 till to date)
2. Dr. Shraddha S. Sakhare
P.G.Guide, M.D. Shalya- tantra
Associate Proff- Shalya-tantra, (since 3.2.2005 till to date)
3. Dr. Shriramji Jyotishi
PhD. (pharma.Sc.), M.Sc. (Org.Chem.)
(37 years of Research and teaching experience in the field of Ayurveda, Presently
Visiting Prof.)

With warm regards.

1. Dr. Sunita S. Hirlekar-Deo
2. Dr. Shraddha S. Sakhare
3. Dr. Shriramji Jyotishi

Date:

Place:

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8	About us / Curriculum Vitae / Biodata

Subject:

Establishment of "Jallaukavacharan"

Anusansthan Sansthan evam Rugnalaya.

[Leech Surgical Research Institute and Hospital]

at Nagpur.

Sponsored by AYUSH

Subject: Aim & Objectives:

^^tykSdkopkj.k^^ vuqla/kku laLFkku (Leech Surgical Research Institute and Hospital)

Aim: - Establishment of a Centre with the objectives as follows :-

Objectives:-

- 1) Studies regarding efficacy and applicability of Jaloukacharan and use jalouka as anushstra in the present era of advanced surgical techniques.
- 2) Providing painless, time shaving shalyakarma, free from any surgical complication to patients may be economically weak also.
- 3) Using Jaloukacharan as recovery with non recurrence and preventive measure for complication and disorders as diabetic foot, gangrene, Hemorrhoids, Anorectal diseases, varicose vein , Rheumatic and Rhematoid arthritis, Neuromuscular disorder, Dermatological disorder, venereal diseases and Ophthalmological disorders, etc.,
- 4) Further advancement of Jaloukacharan method for its use in complicated cases as Cardiac, Internal Abscess Venereal disorders etc.,
- 5) Searching further chemical, biochemical and medicinal facts behind jaloukacharan and to understand and provide it scientific base.

Subject: Introduction

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(Leech Surgical Research Institute and Hospital)

Objective of the Leech Surgical Research Institute

**"Jaloukavacharan" – use of Jalouka as an Anushastra for Raktavistravan
Oriented at Pratishedh.**

INTRODUCTION :-

Life style creates many diseases, as for example late night sleep develops the indigestion, acidity, constipation, hypertension etc. which remains for long time resifting severity of disease such as gastric ulcer, peptic ulcer, hemorrhoids, fissure in Ano, gall bladder stone and so on . So day to day the illness may become severe and the condition take place that the medicine does not work and hence surgery is required in such cases as gall stone, appendicitis, cyst, tumor, liver abscess, and so many blood disorder.

Surgery means operation, operative procedures for correction of deformities, defects, repair of injuries, diagnosis and cure of certain disease. (1).

Shalyatantra is the profile of Sushruta's quality in arts, skill and intelligence is unique in relation to other branches of Ayurveda. Shalya-tantra is one of the branch of ashtangayurveda in which eight types of surgical techniques are described. Among them Raktavistravan is one of the surgical procedure, it is also called as Raktamokshan. It is one of the most effective measures as a half treatment in shalya-tantra. (2) Raktamokshan mean letting out blood from the body in order to prevent and cure disease. Rakta means blood and Moxan means letting out the blood. Jalouka, Shrung, Aiabu are used for raktavistravan. "Raktavistravan" is also the procedure of blood letting. The use of leeches in Ayurved is ancient. There are records of use of leeches for blood letting in early Greek medicine in Europe Hirudinea medicinalis was commonly used for phlebotomy in olden times; the procedure was called "Leechery". In 1863 about 7 million leeches were used in Londen Hospital and 5 to 6 million used in Paris hospital also. The famous English poet William words worth (1802) wrote a poem "leech Gatherer" based on medicinal use of leech. In the 1980 medicinal leech thereby got a big boost by plastic surgeons that used leeches to relieve venous congestion especially in transplant surgery. (3)

So it is today's need to do research on surgical disorders in which Jalauka for 'Jaloukavacharan'. The surgical disorder like Granthi, Vidradhi alagi (kshudra rog) etc, mainly arise from shopha. Some of them go to pakavastha and some of them do not develops paka like Gulma, Arbuda, Galaganda etc, thease surgical disease needs the

operation . But the surgical process in Ayurveda i.e. vistravan which is one of the eight type of shastra karma is most effective surgical procedure. Vedanopshamarthaya means to subside the disease and pakashamaya means to prevent the pakavastha and pachyamanavastha of the disease, acute shopha is recommended for raktavistravan by jalouka and also in painful deep rooted shopha, visham vrana and savish-toxic wound. Vistravan is one of the upakrama of shashthi upakrama of vrana. Shashthi upakrama are included in saptaupakrama. Avasechan is one of the upakrama of saptaupakrama. Jalouka avasechan means raktavistravan by means of jalouka. (4)

In 1985 at Harvard university one of the physician was having great difficulty in reattaching the ear of 5 years old child, the tiny veins kept clotting, he decided to use leech while feeding it they injects salivary component which inhibits both the platelet aggregation and coagulation cascade, thus realizing the venous congestion and induces revascularization. So it is effective in plastic surgery. (5)

Jalouka is the one which is born in water, live in water and does its activities like eating, nourishment in water it is one of the Anushastra in the twenty types of anushastra. And it is the pradhan Anushastra. Anushastra is used as that of shastra and which is not made up of [lohadidhatu](#). (2)

Jalouka sucks only capillary and venous blood and is an effective adjuvant therapy in the management of various medicosurgical condition and widely used in post operative complication. After skin grafts leeches suck the surplus blood from the veins to reconnect naturally, so that the circulation is restored due to its anticoagulant property and prevents blood clotting, it improves macro and micro circulation and clearing blockage, so it is used in microsurgery. Leech injects powerful anesthetic and anti-inflammatory enzymes while sucking the blood, so that patient feels no pain. Sometimes, because of the technical difficulties in forming anastomosis of a vein no attempt is made to reattach a venous supply to a flap at all. This condition is known as venous insufficiency. If this congestion is not cleared up quickly, the blood will clot, arteries that bring necessary nourishment to the tissues will become plugged, and the tissue will die. To prevent it leeches are applied to a congested flap, and a certain amount of excess blood is consumed before the leech falls away. The wound will also continue to bleed for a while due to the anticoagulant hirudin in the leech's saliva. The combined effect is to reduce the swelling in the tissues and to promote healing by allowing fresh, oxygenated blood to reach the area. (5)

Raktavistravan by jalouka as anushastra is also oriented as pratishedh. Pratishedh means to prevent the disease or its advancement and further prevents any other major surgical disorder. 'Jaloukavacharan' is indicated in shishu (child),

shastrabhiru, (those who are contraindicated for shatrakarma) and in shastrabhav (absence of shastra). The persons who undergo raktamakshan regularly in sharad rutu they do not suffer from the diseases likewise, twakdosha (skin disease- kshudrarog), granthi (various types of cyst). Shopha (swelling) and hematological disorders. (2)

In ancient Greek history, blood letting was practiced according to the humeral therapy, which proposed that, when the four humors, blood, phlegm, black and yellow bile in the human body were in balance, good health was guaranteed. An unbalance in the proportions of these humors was believed to be the cause of ill health. Records of this theory were found in the Greek philosopher Hypocrite's collection in the 5th century B.C. Blood letting using leeches was one method used by physicians to balance the humors and to rid the body of the plethora. (5)

When impure blood do not let out, the complication occurs such as kandu (itching), shopha (swelling), dah (burning sensation), rag (redness), pak (suppuration) and vedana (pain) occurs. (2)

So keeping in mind efficacy and benefits of Jaloukavacharan this treatment is really boon to the poor class of society Jaloukavacharan is less expensive, short time treatment; patient's routine activities are not disturbed while this treatment. It is easy going and non restrictive, only single day hospitalization of the patient is sufficient. This treatment can be conducted easily in O.P.D. Pre-surgery arrangement like anesthesia etc., are not necessary. Post surgery medication like costly antibiotics, painkiller are not required. Patient even does not feel that he has undergone a major operation. In gangrene like cases patient has not to suffer the loss of certain limbs as it is prevented from amputation. Leech when applied cuts the skin, no doubt but this cutting is executed easily in very short time no time and without pain.

Coming to the conclusion from the above aspects, jalouka is the anushastra used in various surgical, medicinal condition to avoid the fatal, critical condition of disease and to prevent the disease and emergency condition. No side effect and is very economics compare to the modern surgery. In short, in surgical emergencies jalouka is a divine boon and life savings, being as a live instrument as it is used.

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- 6) Rigbi Meir, Haim Levy, Amiram Eldor, Fuad IRAQI, Teielbaum, Miriam Orevi, Amnon Horobvitz, & Rachel Galun (1987) the saliva of the medicinal leech *Hirudomedicinalis*-II.

**Essentials requirement as per as minimum
standard requirement (M.S.R) given by
AYUSH**

The following essential requirement as per as minimum standard requirement

M.S.R. as per AYUSH

Infrastructure staff and other requirement establishing

"Leech Surgical Research Institute and Hospital"

I	Unit	Constructed Area	Expenditure Approximately
A	Hospital	2000sq. meter	5crore (equipment, recurring And nonrecurring
B	Research Lab	6000sq.meter	5crore (equipment, recurring And nonrecurring)

A Hospital

A-1 Sections

- 1. O.P.D. -** Out patient Department with Toilet and wash basin and Examination room.
- 2. I.P.D. -** 10 Beds, Male ward with attached toilet and bathroom
Female ward with attached toilet and bathroom
- 3. Jallaukavacharan** section- Minor O.T.
Centralization autoclave unit, scrub room, two recovery room,
Doctor's duty room with attached toilet.
- 4. Pathology Lab -** we equipped with attached toilet and wash basin
- 5. Chambers for main staff**
- 6. Office-** with attached toilet and wash basin
- 7. Special design Leech cultivation center**

B. Research Lab

B-1 Sections

- 1. Chemistry Lab with cabin and toilet**
- 2. Pharmacy with cabin and toilet**
- 3. Biochemistry Lab with cabin and toilet**
- 4. Zoology Lab with cabin and toilet**
- 5. Microbiology Lab with cabin and toilet**
- 6. Scientific conference seminar hall**
- 7. Office**
- 8. Research Record Room**
- 9. Library**
- 10. Sophisticated instrument area**
- 11. Common toilet**

A-2 Main Staff

Sr.No.	Post	No.	Qualification
1.	Director	1	PhD. P.G. Shalyatantra Prof. Grade
2.	Deputy Director / Hospital Superintendent	1	PhD / P.G. Shalya tantra Prof. Grade
3.	Deputy Director / Research Officer	1	PhD / P.G. (chem./pharmacy/ Biochem./ Microbiology / zoology) Prof. Grade

A-2a Other hospital staff

Sr.No.	Post	No.	Qualification
1	Physician	3	P.G. Degree in Shalyatantra 1 Prof.Grade 1 Reader Grade 1 Lecturer Grade
2	Medical Officer	2	B.A.M.S.
3	House Surgeon	2	B.A.M.S.
4	Registrar	1	B.A.M.S.
5	Casualty Medical Officer	3	B.A.M.S. / M.B.B.S With Casualty Experience
6	R.M.O.	1	B.A.M.S.
7	Pathologist	1	D.M.L.T
8	Staff Nurse	2	
9	metron	1	
10	Dressor	2	
11	Attendent	3	
12	Cleark	2	
13	Sweeper	2	
14	Ward Boy/ Ayah/a.n.m	1	
15	Pharmasist	2	
16	Store keeper	1	
17	Cook	1	
18	Kitchen attendant/cook met	1	
19	Plumber on contract basis	1	
20	Jallauka care taker	2	Experienced traditional knowledge and skill developed person
21	Water Men	4	
22	Lift Man	1	
23	Electrician	1	
24	Statistician	1	
25	Photographer	1	
26	Ambulance driver	1	

B-2 Staff for Research Lab

Sr.No	Post	No.	Eligibility
1	Deputy Director Research officer Prof. grade	1	Recognized P.G.Degree with doctorate (in anyone of the following subjects) Chemistry /pharmacy/biochemistry/zoology/micro biology 10years of research experience
2	Principle scientific officer Prof grade	4	Chemistry Pharmacy Zoology Microbiology other than the subject of Deputy Director 8 yrs experience
3	Senior scientific officer Associate Prof. grade	5	P.G. recognized P.G. degree with 8 yrs of research exp. PhD.degree with 5yrs of research exp. 1. Chemistry 2. Pharmacy 3. Zoology 4. Biochemistry 5. Microbiology
4	Consultant	-	As an when required
5	Lab technician	5	

6	Sweeper	1	
7	Peon	1	
8	Clerk	1	
9	Librarian	1	

C Salary:

Staff for salary as per U.G.C. scale.

D Required recurring and nonrecurring material for

Leech Surgical Research Institute and Hospital.

Recurring material	No.	Nonrecurring material	No.
Jallauka - Leech	500/yr	Office Table	25
Glass Aquarium		Office chair	25
Plastic Jar		Revolving stool	10
Earthen pot as required		Examination table	1
Turmeric powder as required		Bull light	1
Dressing material as required		Standing B.P. Instrument	2
Cotton		X-ray view box	1
Wave bandage		O.T. Table	1
Paper sticking		O.T. Light	2
Hand Gloves		Pulseoxymeter	1
Disposable needle		Oxygen cylinder	2
O.P.D. Tray		Suction machine	1
Kidney tray		foot step	2
Steel bowl		Surgical Drums	12
Measurement glass		Patients Bed with pillow, pillow with cover cushion, bed sheets , blanket	10
Cap mask gown as required		Cupboards	
Books as required	100	Projector	1
Computer	5		
A.C.	5		

E Ambulance – Mobile dispensary for medical camp.



Special design Leech cultivation center

**Jallauka sharir
And
Introduction**

Jalouka Sharir

Derivation:-

Since jala (water) is their life, they are called **jalayuka** or since they are accustomed / habituated to water they are called **jaloukas**.

Class	-	Varivarg	vari – water
Gender	-	Female	– Grammatically
Symons	-	Raktapa,	jaloukas
Eng	-	Leech	
Hindi	-	Jouk	
Marathi	-	Jalu	
Pleural	-	Bahuvachan	

(Amarkosh page 49)

Types -

Jalouka are of twelve kinds, six are savisa – poisonous and the six are Nirvisha – non poisonous.

Savish - Poisonous

- 1) Krishna
- 2) Karbura
- 3) Alagarda
- 4) Indrayyadha
- 5) Samurdrika
- 6) Gochandana

- 1) Krishna :- Krishna have the colour similar to that of the powder of anjana (antimony) and big head.
- 2) Karbura :- Karbura are broad like varminatsya (a kind of fish), their abdomen, segmaded and bulging.
- 3) Alagarda :- Alagarda are hairy with big flanks (sides) and black mouth.
- 4) Indrayudha :- have stripes on their back.

- 5) Samudrika :- are slightly blackish yellow, have marks resembling many flowers on their body.
- 6) Gochandana :- have their lower part divided into two halves like the scrotum of a bull, and a very small mouth.

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If bitten by these (six) kinds of leeches, there will be profound swelling, itching, fainting, fever, burning sensation, vomiting, toxicity and debility.

Treatment of the bitten wound of poisonous jalauka, Mrahagad should be used in the form of drink (internal polion), external application, nasal medication etc.,

Bite by Indrayudha leech is incurable.

Non-poisonous - Nirvish Jalouka

- 1) Kapila
 - 2) Pingala
 - 3) Sankumukhi
 - 4) Mushika
 - 5) Pandarikmukhi
 - 6) Savarika
- 1) Kapila :- have the flanks as though coloured with manashila (vealgar – slightly red) their back is unctuols coily – snigeha) and have the colour of mudga (green – gram – green).
 - 2) Pingala :- are slightly red, have round body, brown in colour and move quickly.
 - 3) Shankumukhi :- have colour like the liver (brown) drink blood (suek blood) quickly, their mouth being long and penetrating.
 - 4) Mushika :- are similar to mice in shape and colour and have unpleasant odour.
 - 5) Pundarika Mukhi :- have colour like mudga (green gram) mouth resembling the lotus (broad like lotus flower).

- 6) Savarika :- are unctuous (oily) have the colour of lotus petal (slightly red) and are eighteen angula (36 cms) long, this is useful for cattle.

Symptoms of poisonous jalouka bite :-

If bitten by the six kinds of savish poisonous jalouka there will be ---

- 1) profound swelling

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- 2) itching
3) fainting
4) fever
5) burning sensation
6) vomiling
7) toxicity and
8) debility

Physiology :-

Symptoms of non-poisonous jalouka bite :-

With the appearance of pricking pain and itching at the site of the bite, it is to be understood that it (leech) is sucking pure blood, when it beings to suck pure blood it should be removed.

Jalouka (leech) dwell in cold (**sheetadhivasa**), and **born in water**, being these they are **madhur** (madhur guna – properties) hence it is ideal to remove blood vitiated by **pitta**.

Raktavasechana – methods of blood letting :-

Blood vitiated by **vata**, **pitta** and **kapha** should be removed from the body by using **shring** (horn of animals), **jalouka and alabu** (pitches gourd) respectively, blood vitiated by all the dosas by using all these things, for removal of more blood using either horn, leeches or pitcher guard (alaby) is especially suitable.

Places where the Nirvish – Non-poisonous jalouka are found :-

- 1) Yavan - Arab countries
- 2) Pandya - South India
- 3) Sahya - Central India
- 4) Pautana - region around Mathura in U.P.

Best place (water) of jalouka live. - These non-poisonous jalouka live in places where more amount of fragrant water is found, do not feed on dirty foods nor like in slush. Those jalouka which are born from putrified (decayed) padma (lotus) utpala (white lotus) nallina (slight red lotus) kumud

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(lily), saugandhika (another kind of lily highly fragrant), kuvalaya (red lily), paundarika (very white lotus) and saivala (algore) and which live in clean water are non-poisonous.

Jalouka poshan – rearing of leeches:-

Jalouka should be caught with moist leather or by any other method. Then they should be placed in a big loot containing water of ponds or tanks along with their slit. Algae, dried meat of aquatic animals and tubers all made into powder should be put into water to serve as food (for the leeches), straw, leaves of aquatic plants to serve as bed for sleeping, the water in the pot and food materials should be changed once in every three days and they should be transferred to another pot after every seven days.

Ayogya Jalouka – Leeches unfit for use :-

Leeches which are -----

- a. big in their middle (abdomen)
- b. ugly in appearance
- c. very thick
- d. drink (sucks) very little quantity of blood and
- e. which are poisonous are not ideal (unfit for use).

Indications:-

Method of removing blood from the body using jalouka is considered as the easiest and convenient one, It is best suited to kings, wealthy persons, children, old aged, frightful, debilitated, women and person of tender constitution.

Jalouka an Anushastra :-

Jalouka is the prime **anushastra** among the twenty types of anushastra.

What is Anushastra ?

Which is used like that of shastra and which is not made up by lohadi dhoote (iron) is called as Anushastra.

Jalouka – an anushastra where to be used :-

- **Shishu** - child

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- **Shatrabhiruna** - not indicated in surgery.
- **Shastrabhav** - in absence of shastra.

In **Sushrut – samhita**, **Shalya – tanta**, shastra karma is the prime part, it is having main importance. So first of all types of shastra – karma and collection of hvya should be know and is the major part of purva karma, pradhan karma and paschat karma, i.e. pre-operative, operative and post operative is described detail in **Agropaharniya Adhyay**.

Jalukaavacharana – method of applying on the body :-

The patient who is suffering from the disease which is curable by applying leeches, should be made either to sit or lie down, the area/site made rough by rubbing with either mud or fine powder of cow dung without causing pain, the body of leeches should be smeared with the solution of paste of sarshapa (mustard) and rajani (turmeric) and kept in a water pot for a period of one muhurta (28 minutes), then after knowing that they are free from fatigue, one of them should be picked up and made to catch the place of disease, smooth, white moist cotton wool or piece of cotton cloth should be put on it and its mouth moistened with (drops of) water often, if it does not

bite, a drop of milk or blood should be put at its mouth or even a small incision may be made on the body of the patient. In spite of all these if it does not bite, then another leech should be applied.

When it makes its mouth in the shape of a horses hoof, and lifts its neck then it is to be understood as catching / biting, it should be covered with a moist cloth and retained.

After it falls of, its body should be sprinkled with rise flour, it mouth bathed with oil added with salt, held at it tail end by the thumb and fingers of the left hand and its body kneaded slowly in the downward direction with the thumb and fingers of the right hand and make it vomit all the blot has consumed, till signs of complete vomiting appear. After vomiting it moves frantically to and fro in search of when put into the vessel of water, that which sinks and not make movements to be understood as incompletely vomited, that should be made vomit completely once again, that which is not vomited completely develops an incurable disease known as **Indramad**. After it becomes completely vomit it should be put into the pot.

After noticing the proper and improper sucking of blood by the leech area of bite should be anointed with **shatadhauta ghrit** (ghee washed many

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--- 6 ---

times in water or decoction of drugs of clod potency) and a swab dipped in it placed on the site, the wound caused by the leech should be massaged with hot bathed in cold water or a cold poultice made with drugs having astringent sweet unctuous and clod potency by keep over the site and bandaged.

Lastly, the physician who knows well the habitat, methods of catching, varieties, rearing and mode of application of leeches will be able to cure diseases which are curable by the use of **leeches**.

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Orientalia, Varanasi,

3) **Ashtang Sangraha - Vrddhaveyabhat**

Introduction

Leeches, such as the *Hirudo medicinalis*, have been historically used in medicine to remove blood from patients.^[5] The practice of leeching can be traced to ancient India and Greece, and continued well into the 18th and 19th centuries in both Europe and North America. In modern times, the practice of leeching is much rarer and has been replaced by other contemporary uses of leeches, such as the reattachment of body parts and reconstructive and plastic surgeries^[6] and, in Germany, treating osteoarthritis.

The European medical leech *Hirudo medicinalis* and some congeners, as well as some other species, have been used for clinical bloodletting for thousands of years. The use of leeches in medicine dates as far back as 2,500 years ago, when they were used for bloodletting in ancient India. Leech therapy is explained in ancient Ayurvedic texts. Many ancient civilizations practiced bloodletting, including Indian and Greek civilizations. In ancient Greek history, bloodletting was practiced according to the humoral theory, which proposed that, when the four humors, blood, phlegm, black and yellow bile in the human body were in balance, good health was guaranteed. An imbalance in the proportions of these humors was believed to be the cause of ill health. Records of this theory were found in the Greek philosopher Hippocrates' collection in the fifth century BC. Bloodletting using leeches was one method used by physicians to balance the humors and to rid the body of the plethora.

The use of leeches in modern medicine made a small-scale comeback in the 1980s after years of decline, with the advent of microsurgeries, such as plastic and reconstructive surgeries. In operations such as these, problematic venous congestion can arise due to inefficient venous drainage. Sometimes, because of the technical difficulties in forming an anastomosis of a vein, no attempt is made to reattach a venous supply to a flap at all. This condition is known as venous insufficiency. If this congestion is not cleared up quickly, the blood will clot, arteries that bring the tissues their necessary nourishment will become plugged, and the tissues will die. To prevent this, leeches are applied to a congested flap, and a certain amount of excess blood is consumed before the leech falls away. The wound will also continue to bleed for a while due to the anticoagulant hirudin in the leech's saliva. The combined effect is to reduce the swelling in the tissues and to promote healing by allowing fresh, oxygenated blood to reach the area.^[7]

The active anticoagulant component of leech saliva is a small protein, hirudin. Discovery and isolation of this protein led to a method of producing it by recombinant technology. Recombinant hirudin is available to physicians as an intravenous anticoagulant preparation for injection, particularly useful for patients who are allergic to or cannot tolerate heparin.

Hirudin, the principle active agent from the Salvia of the Hirudo-medicinalis, a-65 polypeptide amino-acid, was first revealed by John-Haycraft (1884). Thereafter several other active substances were recovered having various pharmacological properties. These are summarised as follows :

Pharmacologically active substances which have been isolated from various leech species	
Name	Activity
Antistasin	Inhibitor of Blood factor Xa
Apyrase	Cleaves Phosphate from ADP/ATP
Bdellin	Inhibitor of trypsin plasma
Bufrudin	Inhibitor of thrombin
Calin	Inhibitor of collagen platelet Interaction
Calonase	Collagenase
Ceramide glycanase	Cleaves carbohydrates from glycosphingolipids
Decorsin	Glycoprotein Hb Hla antagonist
Destabilase	Depolymerises fibrin
Eglin	Inhibitor of elastase, chymotrypsin
Gelin	Inhibitor of elastase, chymotrypsin
Ghilanten	Inhibitor of blood factor Xa
Hementin	Fibrino (geno)lysin
Hirudin	Inhibitor of thrombin
Orgelase	Hyaluronic acid-specific hyaluronidase.

(Jim Sims 1995)

Active Substances

In the classic injury scenario (open wound, cut), coagulation or clot formation involves 2 processes that occur simultaneously to fill the vascular gap: platelet aggregation (primary haemostasis) and conversion of soluble fibrinogen into insoluble fibrinogen, as a result of a cascade of enzymatic reactions (plasma coagulation).

When leeches are feeding, it is essential for them to maintain the blood in a liquid state. It is necessary to prevent coagulation at the bite site, obstruction of the deep vessels and also to prevent an increase in blood mass in their digestive tract.

To ensure this, leeches secrete saliva containing a number of active substances, such as anticoagulants, platelet aggregation inhibitors, proteinase inhibitors, etc.

The salivary glands are composed of 3 cell populations that cover 2 sorts of secretions :

- A mucous secretion, the main role of which is mechanical, to lubricate the jaws but also to ensure hydration of the stored blood.
- A protein secretion ensuring diffusion, vasodilation, anticoagulation and digestion thanks to numerous active substances.

Anticoagulants

Hirudin

This is a peptide secreted by the leech's salivary glands that is injected into the wound during sucking to prevent the blood coagulating.

It acts on two levels :

1. It inactivates thrombin by taking the place of its natural substrate : fibrinogen.
2. It also acts on factor Xa, which catalyses the conversion of prothrombin into thrombin. Hirudin has the capacity to significantly accelerate release of factor Xa from the epithelial cells. Under the action of hirudin, factor Xa is therefore dissolved in the plasma, where it is subject to the action of its inhibitors.

There are several variants of hirudin :

HV1, which comes from the body of the leech and has no antithrombin activity.

HV2, which comes from the head and has an antithrombin activity. Its molecular weight is 6.95 KDa.

This is the most studied active substances in leech extracts and has been produced using a recombinant process. However, recombinant hirudin is less active than natural hirudin. The major difference between recombinant hirudins and natural hirudin is the desulphated form of the tyrosine residue in position 63; these "desulphatohirudins" are 10 times less active than natural hirudin.

Platelet aggregation inhibitors

In plasma, platelets can aggregate under the influence of numerous substances, such as ADP, epinephrine, thrombin and collagen.

Leech saliva proves to be an effective platelet aggregation inhibitor. This property might explain the fact that leeches are capable of separating the "coagulation time" and the "bleeding time". The characteristic anticoagulant effect of a leech bite is due to the hirudin secreted while the animal is feeding, although it has been demonstrated that hirudin was degraded after around 15 minutes, whereas bleeding persisted for several hours.

The bleeding is thought to be a result of inhibition of platelet functions.

Calin

This protein interferes directly with the platelet-collagen interaction but also with Von Willebrand factor and collagen. These 2 effects might contribute to inhibition of platelet adhesion.

Apyrase

This is a phosphohydrolase that hydrolyses ATP and ADP. It is a potent anti-platelet aggregant.

Collagenase

This enzyme splits the collagen chain. And collagen is involved in activation of platelet aggregation.

A prostaglandin

This substance acts like prostacyclin and its analogues and has an effect on platelet aggregation by preventing the attachment and diffusion of platelets on collagen and activating the adenylyl-cyclase of the platelet membranes, thereby generating an anti-aggregant substance.

Proteinase inhibitors

Bdellin

This enzyme is an inhibitor of trypsin and chymotrypsin. Its action obstructs the action of hirudin on blood coagulation. There are 2 types: bdellin A and bdellin B.

Eglin

This is a lysosomal and bacterial proteinase inhibitor released during certain inflammatory processes, like chymotrypsin, elastase produced by human neutrophils, cathepsin G and other enzymes made by human/granulocytes. This enzyme can play a preventive role in pulmonary emphysema. The elastase/antielastase balance plays a critical role in maintaining the integrity of human pulmonary alveolar structures.

Kallikrein inhibitor

This is an inhibitor of the coagulation factors, kallikrein and factor XIIa, which play a role in the intrinsic coagulation process.

Proteinases

Destabilase

This acts like an isopeptidase i.e. it liquefies soluble fibrin by lysing the ϵ -(γ glutamyl)-lysine bonds of fibrin stabilised by factor XIIIa in the presence of Ca^{2+} . This enzyme therefore gives leeches the ability to lyse clots; this is therefore no longer simply an anticoagulant process but a fibrinolytic supply process.

Lipase and esterase

The salivary secretions of *Hirudo medicinalis* have a lipolytic capacity in order to play a digestive role with respect to the ingested blood. Two enzymes are responsible for this capacity: a lipase and a cholesterol-esterase.

Hyaluronidase

Leech extract presents a diffusion factor. The enzyme responsible for this activity is a strict endo- β -glucuronidase with hyaluronic acid as the only substrate. This enzyme, hyaluronidase, degrades hyaluronic acid, thereby increasing the diffusion of all the active substances inoculated by the annelid's bite.

A vasodilator substance

This is a substance similar to histamine that is thought to play a vasodilator role during sucking.

An anaesthetising substance

The fact that leech bites are practically painless suggests the presence of anaesthetising substances, although this has not been demonstrated.

Platelet aggregation and coagulation inhibitors in leech saliva and their roles in leech therapy.

Prolonged bleeding by the host after the leech ceases to feed and several reports that the use of leeches restores blood flow in the microcirculation after plastic surgery led us to search for inhibitors of platelet aggregation in *Hirudo medicinalis* saliva. Dilute leech saliva was collected by phagostimulating starved leeches with a solution of arginine in saline. The saliva is shown to inhibit human platelet aggregation induced by thrombin, collagen, adenosine diphosphate (ADP), epinephrine, platelet activating factor (1-O-alkyl-2-acetyl-sn-3-glycerophosphoryl choline [PAF]), and arachidonic acid. We have isolated the PAF inhibitor and found it to be an amphipathic phosphoglyceride. We have also purified apyrase adenosine triphosphate ([ATP] diphosphohydrolase), which inhibits ADP-induced platelet aggregation, and have described collagenase. Besides well-known hirudin, *Hirudo* saliva contains a potent inhibitor of coagulation factor Xa. We also report antiaggregant and anticoagulant activities in the crop content of the closely related Nile leech, *Limnatis nilotica*. Anticoagulants of hematophagous species are surveyed. We have used medicinal leeches in plastic surgery for decompression of skin flaps and in patients with postphlebitic syndrome and peripheral arterial occlusions. Preliminary results indicate certain beneficial effects of leech therapy.

Calin-a platelet adhesion inhibitor from the saliva of the medicinal leech.

The saliva of the medicinal leech, *Hirudo medicinalis*, contains a potent, hitherto unsuspected, inhibitor of collagen-mediated platelet adhesion/aggregation. Calin, of molecular size approximately 65 000 (reduced), has a rapid (1-10 min) effect on collagen which is reflected in its ability to suppress collagen-induced platelet aggregation, as well as adhesion of platelets to collagen-coated microcarrier beads. It also causes flocculation of Type I collagen fibril suspensions. Calin is differentiated from leech collagenase in two ways: (1) by demonstrating, by SDS - PAGE analysis of the products of incubations of Calin with Type I collagen at 37°C, that Calin binds to but does not cleave collagen; and (2) by showing that Calin cannot be purified using the methods used to isolate leech collagenase. Calin's rapid and unusual interaction with collagen makes it a prime candidate for one of the agents that are the causative factors of the prolonged bleeding phenomenon seen after leech bites.

(C) Lippincott-Raven Publishers.

Leech

Leech

From Wikipedia, the free encyclopedia

For other uses, see Leech (disambiguation).

Leeches are segmented worms that belong to the phylum Annelida and comprise the subclass **Hirudinea**.^[1] Like the oligochaetes, such as earthworms, leeches share a clitellum and are hermaphrodites. Nevertheless, they differ from the oligochaetes in significant ways. For example, leeches do not have bristles and the external segmentation of their bodies does not correspond with the internal segmentation of their organs. Their bodies are much more solid as the spaces in their coelom are dense with connective tissues. They also have two suckers, one at each end.

The majority of leeches live in freshwater environments, while some species can be found in terrestrial^[2] and marine environments, as well. Most leeches are hematophagous, as they are predominantly blood suckers that feed on blood from vertebrate and invertebrate animals.^[3] Almost 700 species of leeches are currently recognized, of which some 100 are marine, 90 terrestrial and the remainder freshwater taxa.^[4]

Leeches, such as the *Hirudo medicinalis*, have been historically used in medicine to remove blood from patients.^[5] The practice of leeching can be traced to ancient India and Greece, and continued well into the 18th and 19th centuries in both Europe and North America. In modern times, the practice of leeching is much rarer and has been replaced by other contemporary uses of leeches, such as the reattachment of body parts and reconstructive and plastic surgeries^[6] and, in Germany, treating osteoarthritis.^{[7][8]}

Taxonomy and systematics

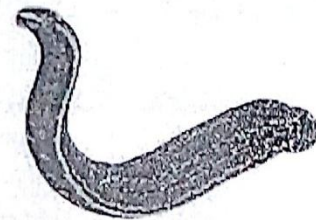
Leeches are presumed to have evolved from certain Oligochaeta, most of which feed on detritus. However, some species in the Lumbriculidae are predatory and have similar adaptations as found in leeches. As a consequence, the systematics and taxonomy of leeches is in need of review. While leeches form a clade, the remaining oligochaetes are not their sister taxon, but in a diverse paraphyletic group containing some lineages that are closely related to leeches, and others that are far more distant.

There is some dispute as to whether Hirudinea should be a class itself, or a subclass of the Clitellata. The resolution mainly depends on the eventual fate of the oligochaetes, which as noted above, do not form a natural group as traditionally circumscribed. Another possibility would be to include the leeches in the taxon Oligochaeta, which would then be ranked as a class and contain most of the clitellates. The Branchiobdellida are leechlike clitellates that were formerly included in the Hirudinea, but are just really close relatives.

Leech

Temporal range: Silurian–Recent

PreC **C** **O** **S** **D** **C** **P** **T** **J** **K** **Pg** **N**



Hirudo medicinalis



Scientific classification

Kingdom: Animalia
Phylum: Annelida
Class: Clitellata
Subclass: **Hirudinea**
Lamarck, 1818

Infraclasses

Acanthobdellidea
Euhirudinea
(but see below)

The more primitive Acanthobdellidea are often included with the leeches, but some authors treat them as a separate clitellate group. True leeches of the infraclass Euhirudinea have both anterior and posterior suckers. They are divided into two groups: Arhynchobdellida and Rhynchobdellida

- Rhynchobdellida are "jawless" leeches, armed with a muscular, straw-like proboscis puncturing organ in a retractable sheath. The Rhynchobdellae consist of two families:
 - Glossiphoniidae are flattened leeches with poorly defined anterior suckers.
 - Piscicolida have cylindrical bodies and usually well-marked, bell-shaped, anterior suckers. The Glossiphoniidae live in freshwater habitats; the Piscicolidae are found in seawater habitats.
- Arhynchobdellida lack a proboscis and may or may not have jaws armed with teeth. Arhynchobdellids are divided into two orders:
 - Gnathobdela: This order of "jawed" leeches, armed with teeth, includes the quintessential leech: the European medical (bloodsucking) leech, *Hirudo medicinalis*. It has a tripartite jaw filled with hundreds of tiny, sharp teeth. The incision mark left on the skin by the European medical leech is an inverted **Y** inside a circle. Its North American counterpart is *Macrobdela decora*, a much less efficient medical leech.^[9] Within this order, the family Hirudidae is characterized by aquatic leeches and the family Haemadipsidae by terrestrial leeches. In the latter are *Haemadipsa sylvestris*, the Indian leech and *Haemadipsa zeylanica* (*yamabiru*), the Japanese mountain or land leech.
 - Pharyngobdella: These so-called worm-leeches consist of freshwater or amphibious leeches that have lost the ability to penetrate a host's tissue and suck blood. They are carnivorous and equipped with a relatively large, toothless mouth to ingest worms or insect larvae, which are swallowed whole.

The Pharyngobdella have six to eight pairs of eyes, as compared with five pairs in Gnathobdelliform leeches, and include three related families. The Erpobdellidae are some species from freshwater habitats.



Haemadipsa zeylanica, a terrestrial leech found in the mountains of Japan

Anatomy and physiology

Like other annelids, the leech is a segmented animal. But unlike other annelids, there is no correspondence between the external segmentation of a leech's body surface and the segmentation of its internal organs.^[1] The body surface of the animal can be divided into 102 annuli, whereas its internal structures are divided into 32 segments.^[10] Of the 32 segments within the body, the first four anterior segments are designated head segments, which include an anterior brain and sucker. These are followed by 21 midbody segments, which include 21 neuronal ganglia, two reproductive organs, and 9 pairs of testes. Finally, the last seven segments are fused to form the animal's tail sucker, as well as its posterior brain.

Reproduction and development

Leeches are hermaphrodites, meaning each has both female and male reproductive organs (ovaries and testes, respectively). Leeches reproduce by reciprocal fertilization, and sperm transfer occurs during copulation. Like earthworms, leeches use a clitellum to hold their eggs and secrete the cocoon.

During reproduction, leeches use hypodermic injection of their sperm. They use a spermatophore, which is a structure containing the sperm. Once next to each other, leeches will line up with one's anterior side opposite the other's posterior. Each leech then shoots the spermatophore into the clitellar region of the other leech, where its sperm will make its way to the female reproductive parts.

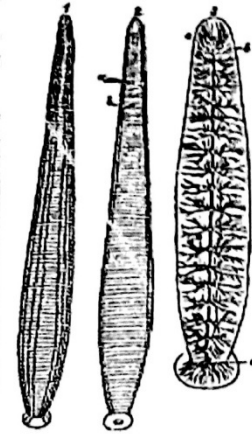
The embryonic development of the larva occurs as a series of stages. During stage 1, the first cleavage occurs, which gives rise to an AB and a CD blastomere, and is in the interphase of this cell division when a yolk-free cytoplasm called teloplasm is formed.^[11] The teloplasm is known to be a determinant for the specification of the D cell fate.^[12] In stage 3, during the second cleavage, an unequal division occurs in the CD blastomere. As a consequence, it creates a large D cell on the left and a smaller C cell to the right. This unequal division process is dependent on actomyosin,^[13] and by the end of stage 3 the AB cell divides. On stage 4 of development, the micromeres and teloblast stem cells are formed and subsequently, the D quadrant divides to form the DM and the DNOPQ teloblast precursor cells. By the end stage 6, the zygote contains a set of 25 micromeres, 3 macromeres (A, B and C) and 10 teloblasts derived from the D quadrant.^[14]

The teloblasts are pairs of five different types (M, N, O, P, and Q) of embryonic stem cells that form segmented columns of cells (germinal band) in the surface of the embryo.^[15] The M-derived cells make mesoderm and some small set of neurons, N results in neural tissues and some ventral ectoderm, Q contributes to the dorsal ectoderm and O and P in the leech are equipotent cells (same developmental potential) that produce lateral ectoderm; however the difference between the two of them is that P creates bigger batches of dorsolateral epidermis than O.^[12] The slugworm *Tubifex*, unlike the leech, specifies the O and P lineages early in development and therefore, these two cells are not equipotent.^[16] Each segment of the body of the leech is generated from one M, O, P cell types and two N and two Q cells types.^[12]

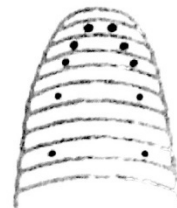
The ectoderm and mesoderm of the body trunk are exclusively derived from the teloblast cells in a region called the posterior progress zone.^{[17][18]} The head of the leech that comes from an unsegmented region, is formed by the first set of micromeres derived from A, B, C and D cells, keeping the bilateral symmetry between the AD and BC cells.^[18]

Digestion

In most blood-sucking leeches the digestive system starts with the jaws, three blades set at an angle to each other. In feeding they slice their way through the skin of the host, leaving a Y-shaped incision. Behind the blades is the mouth, located ventrally at the anterior end of the body. It leads successively into the pharynx, then the esophagus, the crop, the gizzard, and the intestine, which ends at the posterior sucker. The crop is a distension of the alimentary canal that functions as an expandable storage compartment. In the crop, some blood-sucking species of leech can store up to five times the body mass of blood. The leech produces an anticoagulant that prevents the stored blood from clotting, plus other agents that inhibit microbial decay of the blood. These measures are so effective that a mature medicinal leech does not need to feed more than twice a year.



The leech and its nervous system



The number and position of eyes are essential for distinguishing the leech species.

The bodies of predatory leeches are similar, though instead of jaws many have a protrusible proboscis, which for most of the time they keep retracted into the mouth. Such leeches often are ambush predators that lie in wait till they can strike prey with the proboscises in a spear-like fashion.^[19] Some kinds that live on small invertebrates or detritus have neither proboscis nor jaws, but simply engulf their food with the mouth.

Bacteria in the gut were long thought to carry on digestion for the leech, instead of endogenous enzymes that are very low or absent in the intestine. As discovered relatively recently, all leech species studied do produce endogenous intestinal exopeptidases,^[3] which can unlink free terminal-end amino acids, one monomer at a time from a gradually unwinding and degrading protein polymer. However, unzipping of the protein can start from either the amino (tail) or carboxyl (head) terminal-end of the protein molecule. The leech exopeptidases (arylamidases), starting from the tail or amino end and possibly aided by proteases from endosymbiotic bacteria in the intestine, slowly but progressively remove many hundreds of individual terminal amino acids for resynthesis into proteins that constitute the leech. Since leeches lack endopeptidases, the mechanism of protein digestion cannot follow the same sequence as it would in all other animals in which exopeptidases act sequentially on peptides produced by the action of endopeptidases.^[3] Exopeptidases are especially prominent in the common North American worm-leech *Erpobdella punctata*. This evolutionary choice of exopeptic digestion in Hirudinea distinguishes these carnivorous clitellates from Oligochaeta.

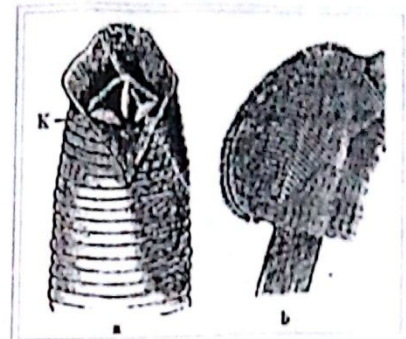
Deficiency of digestive enzymes (except exopeptidases), but, more importantly, deficiency of vitamins, B complex for example, in leeches is compensated for by enzymes and vitamins produced by endosymbiotic microflora. In *Hirudo medicinalis*, these supplementary factors are produced by an obligatory symbiotic relationship with two bacterial species, *Aeromonas veronii* and a still-uncharacterized *Rikenella* species. Nonbloodsucking leeches, such as *Erpobdella punctata*, are host to three bacterial symbionts, *Pseudomonas*, *Aeromonas*, and *Klebsiella* spp. (a slime producer). The bacteria are passed from parent to offspring in the cocoon as it is formed.

Behavior

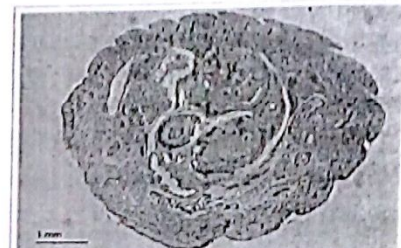
Leeches are able to display a variety of behaviors that allow them to explore their environments and feed on their hosts. Exploratory behavior includes head movements and body waving.^[3]

Feeding

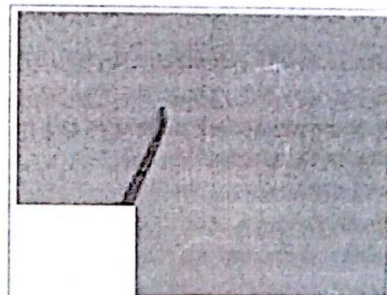
Most leech species do not feed on human blood, but instead prey on small invertebrates, which they eat whole. To feed on their hosts, leeches use their anterior suckers to connect to hosts for feeding. Once attached, leeches use a combination of mucus and suction to stay attached and secrete an anticoagulant enzyme, hirudin, into the hosts' blood streams. Though certain species of leeches feed on



Mouthparts and sucker



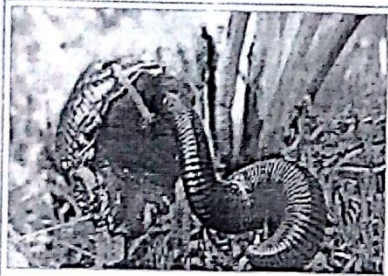
Leech cross-section



Leech climbing a door by Lake Leake, Tasmania

blood, not all species can bite; 90% of them feed solely on decomposing bodies and open wounds of amphibians, reptiles, waterfowl, fish, and mammals. A leech attaches itself when it bites, and it will stay attached until it becomes full, at which point it falls off to digest. Due to the hirudin secreted, bites may bleed more than a normal wound after the leech is removed.^[20]

Leech saliva are commonly believed to contain anesthetic compounds to numb the bite area, but this has never



Leech attacking a slug

been proven.^{[21][22]} Although morphine-like substances have been found in leeches, they have been found in the neural tissues, not the salivary tissues. They are used by the leeches in modulating their own immunocytes and not for anesthetizing bite areas on their hosts.^{[22][23]} Depending on the species and size, leech bites can be barely noticeable or they can be fairly painful.^{[22][24][25]}

Leeches normally carry parasites in their digestive tracts, which cannot survive in humans and do not pose a threat. However, bacteria, viruses, and parasites from previous blood sources can survive within a leech for months, but only a few cases of leeches

transmitting pathogens to humans have been reported.^[26] A study found both HIV and hepatitis B in African leeches from Cameroon.^[27]

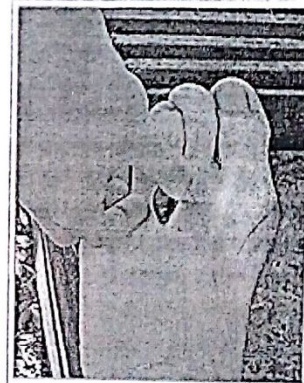
Prevention removal and treatment

One recommended method of removal is using a fingernail or other flat, blunt object to break the seal of the oral sucker at the anterior end of the leech, repeating with the posterior end, then flicking the leech away. As the fingernail is pushed along the person's skin against the leech, the suction of the sucker's seal is broken, at which point the leech will detach its jaws.^{[30][31]}

Common, but medically inadvisable, techniques to remove a leech are to apply a flame, a lit cigarette, salt, soap, or a chemical such as alcohol, vinegar, lemon juice, insect repellent, heat rub, or certain carbonated drinks. These will cause the leech to quickly detach; however, it will also regurgitate its stomach contents into the wound. The vomit may carry disease, and thus increase the risk of infection.^{[30][31][32]}

An externally attached leech will detach and fall off on its own when it is satiated on blood, which may be anywhere from 20 minutes to two hours or more. After feeding, the leech will detach and depart.^[32] Internal attachments, such as inside the nasal passage or vaginal attachments, are more likely to require medical intervention.^{[33][34]}

After removal or detachment, the wound should be cleaned with soap and water, and bandaged. Bleeding may continue for some time, due to the leech's hirudin. Bleeding time will vary, with location, from a few hours to three days. This is a function of the hirudin and other compounds that reduce the surface tension of the blood. Anticlotting medications also affect the bleeding time. Applying pressure can reduce bleeding, although blood loss from a single bite is not dangerous. The wound normally itches as it heals, but should not be scratched, as this may complicate healing and introduce other infections. An antihistamine can reduce itching, and applying a cold pack can reduce pain or swelling.



A land leech can be removed by hand, since they do not burrow into the skin or leave the head in the wound.^[28] A sore develops and lasts for about a week.^[29] Grande Ronde River, Oregon (U.S.)

Some people suffer severe allergic or anaphylactic reactions from leech bites and require urgent medical care. Symptoms include red blotches or an itchy rash over the body, swelling around the lips or eyes, feeling faint or dizzy, and difficulty breathing.^[32]

A study conducted by ARPA in 1963 determined that hydroxycitronellal was an effective repellent against both aquatic and terrestrial leeches.^[35]

Medicinal use of leeches

Further information: Hirudotherapy

The European medical leech *Hirudo medicinalis* and some congeners, as well as some other species, have been used for clinical bloodletting for thousands of years. The use of leeches in medicine dates as far back as 2,500 years ago, when they were used for bloodletting in ancient India. Leech therapy is explained in ancient Ayurvedic texts. Many ancient civilizations practiced bloodletting, including Indian and Greek civilizations. In ancient Greek history, bloodletting was practiced according to the humoral theory, which proposed that, when the four humors, blood, phlegm, black and yellow bile in the human body were in balance, good health was guaranteed. An imbalance in the proportions of these humors was believed to be the cause of ill health. Records of this theory were found in the Greek philosopher Hippocrates' collection in the fifth century BC. Bloodletting using leeches was one method used by physicians to balance the humors and to rid the body of the plethora.

The use of leeches in modern medicine made a small-scale comeback in the 1980s after years of decline, with the advent of microsurgeries, such as plastic and reconstructive surgeries. In operations such as these, problematic venous congestion can arise due to inefficient venous drainage. Sometimes, because of the technical difficulties in forming an anastomosis of a vein, no attempt is made to reattach a venous supply to a flap at all. This condition is known as venous insufficiency. If this congestion is not cleared up quickly, the blood will clot, arteries that bring the tissues their necessary nourishment will become plugged, and the tissues will die. To prevent this, leeches are applied to a congested flap, and a certain amount of excess blood is consumed before the leech falls away. The wound will also continue to bleed for a while due to the anticoagulant hirudin in the leech's saliva. The combined effect is to reduce the swelling in the tissues and to promote healing by allowing fresh, oxygenated blood to reach the area.^[36]

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3. Roy Savvyer (1981). Kenneth, Muller; Nicholls, John; Stent, Gunther, eds. *Neurobiology of the Leech*. New York: Cold Spring Harbor Laboratory. pp. 7–26. ISBN 0-87969-146-8.
4. Boris Sket, Peter Trontelj (2008). "Global diversity of leeches (Hirudinea) in freshwater". In E. V. Balian, C. Lévêque, H. Segers & K. Martens. *Freshwater Animal Diversity Assessment*. *Hydrobiologia* 595 (1) pp. 129–137. doi:10.1007/s10750-007-9010-8 (https://dx.doi.org/10.1007/2Fs10750-007-9010-8).
5. Brian Payton (1981). Kenneth Muller, John Nicholls, & Gunther Stent, ed. *Neurobiology of the Leech*. New

Previous projects worked out and work in progress.

The outcome are updated regularly on websites - www.leechsurgery.info

**By
DR. Sunita S Hirlekar**





Disease - Keloid



Disease - Cyst Over Scalp



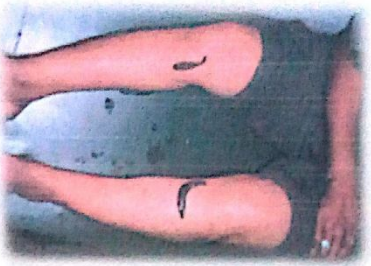
Disease - Ganglion



Disease - Diabetic Feet



Disease - Arthritis



Disease - After Fracture



Disease - Accidental Wound



Disease - Rheumatoid Arthritis



Disease - Rheumatoid Arthritis



Disease - Lock Joints



Disease - Diabetic Foot



Disease - Rheumatoid Arthritis



Disease - Diabetes - complication
(Patient Shri Nitin Gadkari, MI A.)

Disease - Avascular Necrosis
(Patient - Arthoneedic Surmeon.)

Disease-Thyroid GlandEnlarged-

Disease - Locked Knee Joint
(Arogyadham Chitrakoot Camp)
(Patient with Hon Nannai)



Surgery Demo

Surgery Demo - Pg.No. 1 | 2 | 3 | 4 | 5 | 6 |

Disease - Gangrene (Before)



Disease - Gangrene (After)



Disease - Sinus (Before)



Disease - Sinus (After)



Disease - Gangrene



Disease -Diabetic Ulcer



Disease - Cerebellum ImBalance & Dumb (Before)



Disease - Cerebellum Im Balance & Dumb (After)





Ashish Kalia
Under Secretary (P)

राष्ट्रपति सचिवालय
राष्ट्रपति भवन
नई दिल्ली - 110004

*President's Secretariat
Rashtrapati Bhavan
New Delhi - 110004*

No.18/06/P(I)/2007

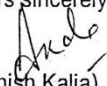
29 June, 2007

Dear Dr. Sunita Hirlekar,


Kindly refer to your letter which was delivered to the President of India during his visit to Maharashtra on 15 June, 2007.

The same has been sent to the Ministry of Health & Family Welfare, Govt. of India, New Delhi.

Yours sincerely,


(Ashish Kalia)

Dr.Sunita Hirlekar,
Jairam Ayurved Research Center
Plot No.6/4, Malaviya Nagar,
Kamla,
Nagpur-440025


Dr. Shreedhar Sakhare
M.D. (Ayurved) B. (Scho.)
Reg. No. 1-20030-3-2

6

भारत सरकार सेवाय

ON INDIA GOVERNMENT SERVICE

No. 18/06/P(1)/2007

राष्ट्रपति सचिवालय,
President's Secretariat,
राष्ट्रपति भवन,
Rashtrapati Bhavan,
नई दिल्ली - 110004.
NEW DELHI - 110004.

Dr. Sunita Hixlekar,
Sairam Ayurved
Research Center,
Plot No. 6/4,
Malaviya Nagar,
Kamla
Nagpur.

Sr. No. 6

Visitor's Pass

for Member of Delegation

(Valid for Tour of Hon'ble President, Govt. of India
on 15th June 2007 at Nagpur)

Name of the Head of the Delegation : Dr. Sumita Shrinivas Hirlekar

Total No. of Persons in Delegation : 1 (One)

Place : Air Force Station,
Shivangaon, Nagpur

: 6.55 pm to 7.40 pm



For District Magistrate,
Nagpur

15/6/07

For obtaining copy of photograph kindly write to :-

Press Secretary/Deputy Press Secretary
to the President
Rashtrapati Bhavan, New Delhi.

Fax Nos. 011-23794498/011-23010252

E-mail - photorb@gmail.com

M
Dr. Shrivadhwa-Satish
M.D. (AYU), A.D. (Scho.),
Reg. No. I-26326, A-1.

NAGPUR POLICE

ENTRY PASS

ID : 4204

PRESIDENT OF INDIA

४३५९

Name :- **DR. SUNITA SHRINIWAS
HIRLEKAR**

Address :- , PL. NO. 6/4 MALAVIYA NAGAR
KHAMLA , NAGPUR 25 ,



Date :- 15/06/2007 (Valid for this date
only)

Time in :- 5:32:47 PM



No.Z.16011/7.99-P&E
Government of India
Ministry of Health & Family Welfare
Department of ISM & H

IRCS Building,
New Delhi, Dated the 28th August, 2001

To

Dr. Suneeta S. Hirklokar
Shri G. M. S. Ay. College
Yavatmud

Sub Screening Test for Selection of Ayurveda Experts for Deputation abroad

Sir,

The Department of ISM & Homoeopathy has planned to prepare a panel of experts in Ayurveda for deputation posting and to attend seminars/conferences abroad on the basis of their bio-data received by us. It is decided to consider your name for selection in the panel of experts. You are requested to attend the interview screening test for the said selection scheduled to be held on 18th September, 2001 at 2.30 P.M. in the Committee Room, Indian Red Cross Society Building, Red Cross Road, New Delhi-110001. The to and fro Delhi New Delhi Journey fare will be paid and restricted to maximum of Railway AC-II tier fare of Mail Express trains (except Rajdhani and Shatabadi Express) and it will be paid at the spot on producing photocopy of the tickets. No D.A. or local journey fare will be paid and you are requested to make your own arrangement for stay in Delhi.

2 Further, I request you to send your latest bio-data in the enclosed proforma through FAX (No.011-3731846 or 011-3327660). Please bring a copy of the bio-data while coming for the screening test on 7.9.2001

Dr Suneeta attended the
interview in the Dept. of
ISM & H on 18/9/2001.

Yours faithfully,

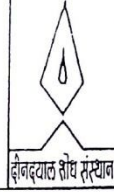
(K.L. TANEJA)
DIRECTOR (P&E)

18/9/2001
Dr. Suneeta S. Hirklokar
Shri G. M. S. Ay. College
Yavatmud
Dep. of ISM & H
New Delhi
Reg. No. 103523-A-1

दीनदयाल शोध संस्थान

आयुर्वेदधाम

जे. आर. डी. टाटा
आयुर्वेद एवं योग विज्ञान
शोध प्रतिष्ठान



JRD TATA FOUNDATION
FOR RESEARCH IN
AYURVEDA & YOGA SCIENCES

No. TFRA/Exp./3/99-2000/ 822

Date: 13-11-99

प्रमाण पत्र

प्रमाणित किया जाता है कि सुश्री ऋषा विकास देव (सुनीता हिलेकर) अधिव्याख्याता शल्यतंत्र आयुर्वेद महाविद्यालय पुरंदर के द्वारा जलौका एवं सिरावेध चिकित्सा शिविर का आयोजन आजीवन स्वास्थ्य लाभ एवं विभिन्न प्रकार के रोगों से पीड़ित रोगियों के स्वास्थ्य लाभ हेतु 10 नवम्बर से 13 नवम्बर 1999 तक किया गया तथा संगोष्ठी का कार्यक्रम भी किया गया। हम आपके कार्य की प्रशंसा एवं उज्ज्वल भविष्य की कामना करते हैं।

ओ०पी० सिंह
संयोजक

बी०के० श्रीवास्तव
प्रशासनिक अधिकारी

इस विषयों के
विशेषज्ञों के
अभिप्रेत -
नानादेश्वर
13-11-99

मा. गो. वैद्य

मार्गदर्शक संपादक, दै. तरुण भारत, नागपूर
मार्गदर्शक, महाराष्ट्र राज्य विधान परिषद

८०, विद्या विहार, रिंग रोड,
राणा प्रतापनगर, नागपूर-४४००२२
भ्रमणधनी क्र. ९८८१७१७८०९
ई-मेल : babujivaidya@gmail.com
Blog : mgvaidya.blogspot.com

दिनांक :

प्रशस्तिपत्र

डॉ. सुनीता श्रीनिवास हिलेकर, जो विवाह के पश्चात् श्रीमती ऋचा विकास देव बनी है, आयुर्वेद के शल्यचिकित्सा शास्त्र की विशेष ज्ञाता है। बी. ए. एम. एस. से लेकर एम. डी. तक सारी परीक्षाएं, उन्होंने अच्छे गुणों से उत्तीर्ण की हैं। डॉ. सुनीता स्वयं पीएच. डी. तो है ही किन्तु पीएच. डी. के परीक्षार्थियों के लिये मान्यताप्राप्त मार्गदर्शक (गाईड) भी है। अध्यापन का भी उन्हें पर्याप्त अनुभव है। हाल में प्रोफेसर श्रेणी के पद पर वह कार्यरत है, तथा के. आर. पाण्डव आयुर्वेद महाविद्यालय की प्राचार्या भी है। डॉ. सुनीता के सम्बन्ध में और एक विशेष बात यह है कि, आयुर्वेदशास्त्र के परंपरागत विद्वान परिवार में उनका जन्म हुआ है। उनके पिता तथा पितामह अमरावती शहर के प्रसिद्ध, लोकमान्य आयुर्वेद के चिकित्सक थे। मैं डॉ. सुनीता को किसी भी उच्च पद के लिये योग्य मानता हूँ। और मुझे विश्वास है कि वह उस पद को समुचित न्याय देगी।

हस्ताक्षर

-मा. गो. वैद्य

नागपूर

दि. 04-03-2015



www. **LEECHSURGERY**.com



Dr. Sunita Hirlekar (Reacha Deo)
B.A.M.S, M.D, Ph.D. (Surgery), B.P.A Drama
Professor Shalyatantra
(Fellow International Academy of Indian Medicine,
Nagpur)

Resi : DR. S.S. Hirlekar (Reacha Deo),
C/o. Vikas W. Deo, Plt.no. 6/4 P. Malviya Nagar,
Khamla, Nagpur, M.S.
Mobile : 9850887453 / 9850735818

Professional Activities and Past Participation

• Successfully appeared the Screening Test on 18-9-2001 for Ayurveda expert, to Deputation at abroad through Ministry of Health of Family Welfare Delhi, India...
But the correspondence from the above department / appointment for the concern programmed still pending to the current date.

• Meeting with Hon. President of India Dr. A.P.J. Abdul Kalam on 15.6.07 about website on www.leechsurgery.com and discuss the importance of leech.

We have all appointment letters with postage details about meeting. On this basis, many times we try to contact on their given email address / official postal address for the photocopy of the meeting with the Hon. President but the President Officials never revert any mail or postage...

Eagerly waiting for Active Enroll as a Hon. Head and Ayurveda Expert for Leech Therapy / Surgery and Siravedha therapy, in Central Council For Research in Ayurveda and Siddha New Delhi.

Also wants to enroll as a Hon. Central Council For Research in Ayurveda and Siddha (CCIIM) member...

And have idea to establish a Nagpur Ayurveda regional office sponsor by Dep't. Of Research of Ayush, New Delhi. And Nagpur Social welfare ..

Project – Leech a Novel Surgery under the direction of ---

Dr. S.S. Hirlekar Deo

Nitin Gadkari

Member of Parliament, Nagpur
Former National President
Bharatiya Janata Party

D.O. No. 11/10/2013
Date : 17 October, 2013

Sub : Regarding the extension of cooperation to the applicant for getting her appointed
on Deputation as Ayurved Expert and the others.
Ref : A memorandum submitted by Dr S S Hirlekar Deo, C/o Vikas W Deo,
Plot No. 6/4 P Malviya Nagar, Khairla, Nagpur.

Sir,

Applicant Dr S S Hirlekar Deo is the resident of Nagpur and is closely associated with me. She had been working in the field of Ayurveda and has been known as expert from the field. She wants to expand the circumference of her work and also benefit the people with Ayurveda. Besides this, she wants to render the services in different sectors.

She had applied with the Department of AYUSH, under Ministry of Health and Family Welfare for getting deputation at abroad through the Ministry. She appeared for the screening test back in 2001 and still has not been given any reply by the concerned officers of the department.


She is willing to play active role as Hon. Head and Ayurveda Expert for Leech Therapy / Surgery and Siraveda Therapy in Central Council for Research in Ayurveda and Siddha, New Delhi. Here also she has not been given any response by the concerned officers of the ministry.

The applicant is willing to establish Nagpur Ayurveda Regional Office with the sponsorship of the Department of Research of AYUSH, New Delhi and render social and health service in the area. Here also no cognizance of the applicant has been taken till the date and she has been waiting eagerly for positive response.

I think the urge of the applicant is a genuine one and she need be given positive response so that the people too can be benefited with her services. So, I want you to consider the urge of the applicant and take action. Please keep me updated with the developments in the matter.

Thanking You !

Yours,


(Nitin Gadkari)

The Secretary,
Department of AYUSH,
Ministry of Health and Family Welfare,
New Delhi.



Address for Correspondence : NAGPUR : Gadkari Wada, Upadhye Road, Mahal, Nagpur 440 032 Maharashtra Tel: (0712) 2727145
DELHI : 13, Teenmurti Lane, New Delhi 110001 Res: (011)-2301 1027 4127
MUMBAI : 1201 A, 12th Floor, Sukhada Co-Op Housing Society, Worli, Mumbai 400030 Tel: (022) 24970287 1892
E-mail : email@ndingadkari.org Website : www.ndingadkari.org

About us: DR. Sunita S Hirlekar

Curriculum Vitae: Dr. Shriramji Jyotishi

Biodata: Dr. Shraddha S Sakhare

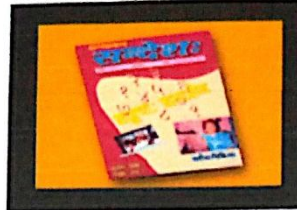


LEECH SURGERY

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Jalauca **News Updates**

दिन विशेष कई घातक बीमारियों से दिलाई है निजात
नागपुरी जोंक की दुनिया घर में सांग

[illegible]

कलकत्ता और बंगाल की सीमा स्थित मुगल शासक शाह जहाँ की स्मृति के रूप में बनाया गया है। यह स्मृति 1650 में बनाई गई थी। यह स्मृति 1650 में बनाई गई थी।

[illegible]

Jalauca is called Leech, blood sucker a slimy ectoparasite, Hirudo medicinal Jala means water. Jalauka resides in water. Jalauka is mentioned in indigenous medicine from its very beginning 'Dhanvantari' is the deity of Ayurved. He carries 'Jalauka' in one of his hand as a symbol of surgical instrumentation or surgery 'Sushrut' is the godfather of Ayurvedic surgery. Sushrut-Sanhitā is the treatise 'Jalaukavacharaniya' is one of its chapters everything's about 'Jalauka' is scientifically described in it.

Read More.

Read More.

Dr.Sunita Hirlekar (Reacha Deo)
B.A.M.S.,M.D.,Ph.D.(Surgery), B.PA Dra ma
Professor Shalyatantra
Mobile : 9850887453 / 9850735818
Email : reacha2010@gmail.com

Copyright ©2008 Dr. Reach Deo, Nagpur All rights reserved.<<Admin>>

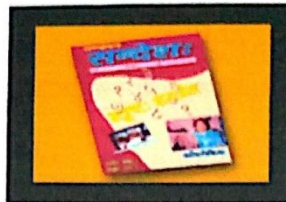
Hon'ble Dr. Mohan Bhagwat:*

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About Us

[CLICK HERE FOR BIODATA](#)

Name of expert : **Dr. Suneeta Shrinivas Hirlekar**

Present Position : PRINCIPAL w.e.f from 08.05.2013

Expert (Shalya-Tantra)

M.U.H.S. Nashik (Teacher's Approval)

Qualification : BAMS, MD Shalya-Tantra, Ph.D., B.PA Drama

Experience In years

1. From 18/7/93 to 31/7/03-Ayurved college, Pusad.
2. 1992-93 P.G. Hon. Lecturer V.A.M.V. Amravati.
3. From 18/7/1993 to 29/4/02- Lecturer Shalya-Tantra.
4. From 30.4.2002 to 12.7.2010, Reader Shalya-tantra
5. From 12.7.2010 to up to date working as Prof. Shalya-Tantra.

Research Publications

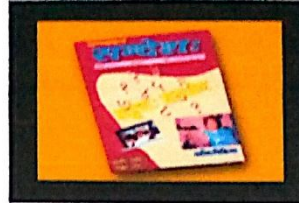
1. Image Nimacon 99 - Solapur.
2. Souvenir - Jalgaon.
3. Ayurvediya - Pune - 1999
4. Sam. sndesh-Banglore-Jul. 2000.
5. M.U.H.S. Nashik - Jan. 2000.
6. Marathi Medical News, Panvel, Mumbai-2000.
7. Ayurved Manchi Hill Pancha Visheshank March-2006
8. Souvenir-National Scintific seminar on the role of the Ayurveda in Sports Medicine March-2006

Past Participation

1. National Workshop on Panchkarma, Nagpur - Speaker
2. 19th Maharashtra State Conference of NIMA - Akola - Speaker.
3. 20th National and 21st Maharashtra State Conference of NIMA - Solapur.
4. Deendayal Shodha Sanstan - Arogyadham, Chitrakoot.
5. Interpathi Research Convention - M.U.H.S., Nashik.
6. Bruhanmaharashtra Prachya-vldya Parishad-4th Conference, Nagpur.
7. National Scintific Seminar on the role of Ayurveda in Sports Medicine- Siravedha
8. Guide- National Scintific Seminar on the role of Ayurveda in Sports Medicine(March-2006) Presented by two student B.A.M.S.
9. Seminar - 'Siravedha a key to stress management' at Nerul, Nov. 2008
10. Seminar - 'Siravedha and leech' at K R Pandav Ay. College, Dec. 2010
11. Presented National Seminar - Preventive Cardiology through Sira-Vedha- 11/10/2011
12. Presented National Seminar, Oct 2012 (Diabetic Foot)
13. October. 2012 Sandhivatta and Vattarakta - Ayurvedic Shalya Tantra- View.
14. January 2013 - Ayurved Vyaspeeth Nagpur.
15. **Guest Speaker** : 3rd International conference yoga-Ayurveda-Mothercow and Rural Reconstruction - Pre-Conference Seminar August 2013. Subject _ Gavya Chikitsa for Ayurvedic Management of Cancer Diabiltisity & Arthritis
16. **Speaker & Chairperson** : National Seminar on Role of Ayurveda in Management of Geriatric disorders. Subject - Madhumeha
17. M.E.T. M.U.H.S. Nashik Workshop - Cct. 2013 at Nagpur

18. **National Seminar** - on Evidence based Leech application as presentation -at R.A.PODAR Medical College Worli, Mumbai - Oct. 2013
19. **Invitee** - by HITWADA Nagpur
20. **Invitee** - by Vijnana Bharti - An Inspirational talk with Hon. Dr.A.P.J. Abdul Kalam at Nagpur, 2014
21. **Co-Chairperson** International Seminar - Recent advances in Herbal Medicines Nagpur, Oct.2014
22. **Participation** in meeting with Hon. Dr. Vanita Murlikumar, President C.C.I.M, New Delhi, Oct.2014
23. **Participation** in 6th World Ayurved Congress at Pragati Maldan, New Delhi from 6 to 9th November 2014.
24. Attend Discussion Meeting - CCIM's Academia Researchers Conclave. 6th November 2014.
25. CCIM TIN NO.- AYU ST 0522 and invitation AYUSH AAJ - by Ayush M.S. Aantarbharati on 15.02.2015 at Mumbai
26. **Participation** - Dellgate - Swargiya Dadasaheb Kalmegh Smrutli Dental College, Nagpur - Lecture by V.C., M.U.H.S.- 31-7-2015
27. **Participation** - Golden Jubilee Celebration- Sh.Ay.M.V.Nagpur.- 9:10:11 -Oct.2015
28. **Guest Speaker** - 2 nd National seminar - Unnat Bharat Abhiyan ; 13 -10 - 2015 ; G .Ay.College, Nagpur
- Fluency in Language** : Sanskrit, Marathi, Hindi, English.
- Research Papers**
1. Leech Application Therapy - A practical Investigation.
 2. Jalauka Chikitsa - Ek Adhyayan.
 3. An experimental study of Rakta Mokshan venous blood-letting with respect to panchakarma and key +0 long healthy life.
 4. 'Reiki' - Ayurvedic Drushtikon.
 5. Jalauka - An experimental study - Nashik Unviersity.
 6. Sira-vedha- Sanskrit and Hindi Paper.
 7. Prameha Prayogic Adhyayan.
 8. Reiki
 9. 'Leech a novel surgery', 13th National Homoeopathy conference, Amravati Dated 22 & 23 Jan 2005.
- Other Activities**
1. Selection for Screening Test for selection of Ayurveda expert for deputation abroad through Ministry of Health of Family Welfare Delhi, India.
 2. Selection for paper presentation NSA 3rd Annual conference Thiruvanthapuram, India.
 3. B.M.P.V. Parishad - Nagpur, Jan 2002 - Research Paper - Summery Subject - Leech.
 4. Nima - Vidarbha Conference Jan - 2002 Paper published in Souvenir on subject for Ph.D. Degree.
 5. Meeting with Hon.President of India Dr. A.P.J. Abdul Kalam on 15.6.07 about website on Leechsurgery.com and discuss the importance of leech.
 6. Meeting with Hon'ble V.C. M.U.H.S., Nashik and discuss about website on 10.04.2014 at GAC, Nagpur
 7. [Ancher for Sanskrit Geet Ramayan\(https://www.youtube.com/embed/s9Dg9Dwrvvw\)](https://www.youtube.com/embed/s9Dg9Dwrvvw)
 8. [Sanskrit Geet Ramayan 16 min edited programme Swami Samarth Math, Malviya Nagar, Nagpur\(https://www.youtube.com/embed/3pJ04cNyJo\)](https://www.youtube.com/embed/3pJ04cNyJo)
 9. [Sanskrit Geet Ramayan Swami Samarth Math, Malviya Nagar, Nagpur\(https://www.youtube.com/embed/I19qw0kqpFc\)](https://www.youtube.com/embed/I19qw0kqpFc)
- About Literature**
1. Published - 'Sant Jairamaskrita Manache Shlok - Sanskrit Bhavanuvada'
 2. Published - 'Lahari Lahari Aani Lahari' - Biography of Shri Sant Jairamdas - Kamatha on 10th December, 2003
 3. Sutra Sachalan -Dr.Girish Oak-falication programme, at lahari Aasharama kamtha in Murtee Prana Prathistha programme -10.2.08.
 4. Sutra Sachalan -Falication programme, at lahari Aasharama kamtha Dec.08.
 5. Sutra Sanchalan - Falication - Dr. S.P.Hirlekar by V.V.Sanskrit P.V.P.S.A Amravati. 21.12.2012
 6. Sutra Sanchalan - Falication - Actor- Dr. Vilas Vjavane, Milind Dastane, Monika Thakkar - at Lahari Aasharam, Kamtha on 06/02/2014
- International Seminar**
1. International Seminar on hair and skin care by international academy of ayurved on sunday 7 march 2010 pune poster presentation on topic Leech Hair care.
 2. Guest - Palliative workshop (Tata Memorial Hospital, Mumbai) at J.A.M.C, Nagpur


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Contact

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Leech is one of the sharp but, para-surgical, [Live a slimy ectoparasite] instrument Leech alone can do three types of surgery of 8. Leech can be used as anushastra in surgical disorders of vital organs. Surgical orders, Surgical branches, surgical conditions are Fissure, Piles, Cyst, Ulcer, Abscess, Inflammation, A vascular, Necrosis, Nerve & Muscular disorders, Arthritis, Gangrene, Keloids, Diabetic foot, etc.

Advantages are

- | | |
|------------------------------|----------------------|
| 1. Tiny Incision | 2. Y-Shaped Incision |
| 3. Natural Anaesthesia | 4. Closed method |
| 5. Saving (Time-steps-money) | 6. Cosmethic |
| 7. Sterilised wound | 8. Fast healing |

Importance of Leech therapy is obvious if one goes through the Ayurvedic literature and are related to blood. Otherwise life-threatening situations may results. Hence in the therapeutic approach blood-letting procedures, Leech applications is useful in deep seated disorders and it is also harmless procedure, which can be used, even in very weak and sensitive subjects. Hence, Leech therapy was tried out in different stages of disorders. In this experimental study ; within a short-time span relief of symptoms and positive results were found. The claim put forth in Ayurveda were validated.

"Indian Leech a devine boon to Surgery"
Please welcome with your most precious opinions



National Seminar on Evidence Based Leech Application



Organised by

**DEPT. OF SHALYATANTRA, & HIRUDOTHERAPY CENTRE,
R. A. Podar Medical (Ayu) College,
Dr. Annie Besant Road, Worli, Mumbai – 18**

—◆— **Date & Venue** —◆—

**On Sunday, 20th October, 2013
Golden Jubilee Hall, R.A.Podar Medical College,
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—◆— **Contact** —◆—

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22) Leech : A Novel Surgery ✓

Dr.Sunita Hirlekar (Reacha Deo)

B.A.M.S.,M.D.,Ph.D.(Surgery), B.PA Dra ma, Principal - Professor Shalyatantra

Shri K.R. Pandav Ayurved College & Hospital, Nagpur-441204

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Leech is one of the sharp but, para-surgical, [Live a slimy ectoparasite] instrument Leech alone can do three types of surgery of 8. Leech can be used as anushastra in surgical disorders of vital organs. Surgical orders, Surgical branches, surgical conditions are Fissure, Piles, Cyst, Ulcer, Abcess, Inflammation, A vascular, Necrosis, Nurve & Muscular disorders, Arthritis, Gangrene, Keloide, Diabiti foot, etc.

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Importance of Leech therapy is obvious if one goes through the **Ayurvedic** literature and are related to blood. Otherwise life-threatening situations may results. Hence in the therapeutic approach blood-letting procedures, **Leech** applications is useful in deep seated disorders and it is also harmless procedure, which can be used, even in very weak and sensitive subjects. Hence, **Leech** therapy was tried out in different stages of disorders. In this experimental study ; within a short-time span relief of symptoms and positive results were found. The claim put forth in **Ayurveda** were validated. "Indian Leech a devine boon to Surgery", Please welcome with your most precious opinions

Role Of Jalaukavacharan In Thrombosed Heamorrhoid In Pregnancy

****Dr. Surekha Dewaikar. *Dr. Gandhali Acharekar**

****HOD *2nd Yr P.G Scholar**

Streerog Prasuti Dept., M.A.P.H. Mumbai.

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In pregnancy haemorrhoids are found very commonly. Due to increased abdominal pressure and constipation haemorrhoidal plexus get dilated and inflamed resulting in formation of haemorrhoids. In charak Samhita Acharya charak has narrated raktamokshan as a treatment of Arsh. In modern medicine preferable treatment for haemorrhoids is anti-inflammatory drugs and surgical intervention which has limitations in pregnancy and its own complications. So by keeping this in mind we decided Jalaukavacharan as a treatment of haemorrhoids in pregnancy.

Method: A 32yr Primi patient, 30.2wks came with complaints of severe pain and swelling at anal region. After local examination it was diagnosed as thrombosed inflamed external haemorrhoids. She was then treated with 2sittings of Jalaukavacharan with 7 days of interval, Hot sitz bath B.D., Drakha 20gm HS daily. Clinical evaluation was done and data was documented.

Result: With Jalaukavacharan the clinical symptoms were significantly reduced and there was marked reduction in pain, thrombosis and inflammation.

Conclusion: From the above we can say that Jalaukavacharan is very effective and safe therapy in inflamed, thrombosed haemorrhoids in pregnancy. And it delays the requirement of surgical intervention.

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MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES NASHIK

ABSTRACT BOOK

CONVENTION ON INTERPATHY RESEARCH



2000

॥ स्वास्थ्यरक्षणाय विज्ञानानुसंधानाय च समर्पितम् ॥

Jalauka – An Experimental Study ⁰⁴

Sunita Herlekar

Importance of leech therapy is obvious if one goes through the Ayurvedic literature and from its successful re-introduction by modern medicine.

Sushruta had advised bloodletting by leeches in surgical disorders. As per the Ayurvedic literature doshas are related to blood and hence to interrupt the pathophysiology of the disorders as well as to find out the dosha responsible for the disorder, it is necessary to get rid of vitiated blood. Otherwise life-threatening situations may result. Hence in the therapeutic approach blood-letting is the first line of therapy. In all bloodletting procedures, leech application is useful in deep-seated disorders and it is also a harmless procedure, which can be used, even in very weak and sensitive subjects. Hence leech therapy was tried out in different stages of disorder. In this experimental study within a short time span relief of symptoms and positive results were found. The claims put forth in Ayurveda were validated.

The details of this paper will be discussed at the time of presentation.

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FREQUENTY ASK QUESTIONS

Answers :

Jalauka (Leech) and Medical Science.

1. What is Jalauka ?

Jalauka is called Leech, blood sucker a slimy ectoparasite, Hirude medicinalis Jala means waters and menans abode Jalauka resides in water. Jalauka is mentioned in indigenous medicine from its very beginning 'Dhanvantari' is the deity of Ayurved. He carries 'Jalauka' in one of his hands as a symbol of surgical instrumentation or surgery 'Sushrut' is the godfather of Ayurvedic surgery. Sushrut-Sanhita is the treatise 'Jalaukavacharaniya' is one of its chapters everything's about 'Jalauka' is scientifically described in it.

There are two kinds of Jalauka-toxic and non-toxic, non toxic Jalauka is used for medical purpose how non-toxic Leeches are identified how these are caught and nourished. What is the specific anatomy of the leech. So or and so forth is described in the tretise.

The length of a Leech is between 1.5 am to 4.5 am it has two mouths and two hearts. It has 300 teeth. Some of them do not suck up the blood. Its saliva contains various chemicals. A Leech is an organic Laboratory in itself in western countries Leech cultivation is flourishing day-by-day at present it has been absorbed that Leech can be a wonderful remedy in the disease like gangrene and so it is considered a boon to western medicine now a day.

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2. What are benefits of leeches?

1. Leech sucks out the blood.
2. This is termed Rakta-mokshan in Ayurved which is one the important treatment in Ayurvedic surgery.
3. Leech is the most harmless and effective instruments for Rakta-mokshan.
4. When Pitta Dosha, blood in deep in the body become impure, Leech application is most effective.
5. In severe pain also it is effective as well.
6. Effective in Local-swelling or inflammation.
7. Effective in infection.
8. Effective in septic wound-ulcer.
9. One of the subordinate surgical instruments/Anu-Shastra.
10. Effective in disease of circulatory and nervous system.
11. Effective In non-surgical cases like those in children aged, weak and pregnant persons.

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3. What is Jalauka ?

Leech sucks out the blood but there are other methods also for the same for example cow horn, these are prescribed by Sushrut himself Leech, at a time, can suck out the blood quantitatively five times of its weight. But in compassion to other procedures this quantity is not considerable Leech application no doubt, is the least remedy where blood ejection is necessary but it is used in other circumstances also only because it is a live instrument not only does it suck out the blood but is ejaculates saliva in the wound at the same time this saliva contains certain chemicals functioning in various ways some of them are as follows.

- a. Hirudin arrests blood clotting.
- b. Expanding chemical destroys micro-bacteria.



Questions

Jalauka (Leech) and Medical Science.

1. What is Jalauka?
2. What are benefits of leeches?
3. How leech functionates?
4. Specifically in which acute-condition leech should be applied?
5. In Which chronic ailments leech application is prescribed?
6. How is leech application preventive?
7. How does a leech alone act successfully in all of these various diseases?
8. HIV and or Sterilization and Jalauka?
9. Follow up?

[Jalauka \(An Audio\)](#)

[Leech & Medical Sci.](#)

Jalauka (Leech) - A Para-Surgical Sharp Instrument.

1. What is 'Anushastra'?
2. How Jalauka is operated as a sub-ordinate instrument?
3. Quite some of the cases where Leech-application was performed?
4. Do you take resort to procedures others than Leech?
5. Can we operate Leech in surgical emergency?
6. What about other factors of this Leech treatment? Bay - economy, availability, approach, site provision assistances tools - so an and so forth?

- c. One of the chemical acts as a anesthesia.
- d. Hemet tin dissolves dots in the blood.

In short, Leech is a live pharmacy as it is acts through these chemicals.

The usefulness of Leech application in various is approved in modern medical sciences also. But this modern thought is described and prescribed in detail long-long ago in the treatise by sushrut and certainly, we Indians should be proud of it.

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4. Specifically in which acute-condition leech should applied?

1. Leech application in acute condition avoids fatality.
2. Severe type of pain like that appendicular or calic pain can be cooled down.
Septic ulcer, burns or blisters, inflammation, Gangrene, wound, Fissure, prolapsed in
3. blaimed pile, fatal ailments of delicate organs infection, obstruction in movement of different limbs- in all these conditions Leech application is a useful remedy.

In short, in acute conditions of surgical ailments Leech application can avoid emergency side - effects can also be avoided. In this condition, Leech acts as an anti-inflammatory remedy.

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5. In which chronic ailments leech application is prescribed?

1. All sorts of skin diseases
2. Blood imparity - diseases
3. Arthritis
4. Rheumatoid Arthritis
5. Piles
6. Fissure
7. Non-healing ulcer
8. Gangrene
9. Elephantitis
10. Diabetic off shoots
11. Headache
12. Joint Stagnancy
13. Vericosed vain
14. Ecz ena
15. Cyst
16. Growth
17. Gout.
18. Keloid

Are some of the long time ailments where Leech application is prescribed.

In short, nearly all surgical cases can be cured with Leech application. In such cases Leech sucks out blood and acts as a surgical instrument. Various bacteria's taking resort in blood create several diseases. Leech sucks out this impure blood and thereby roots out the causes of diseases and removes blood - circulatory hindrances this process is termed in Ayurved as removing.

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6. How is leech application preventive?

1. Prevention is better than cure.
2. is the premier aim of Ayurved.
3. Seasonal purification of the body prevents seasonal ailments the capacity of warding off the disease can also be promoted by it.
4. Leech application is beneficial for Local purification in post-autumnal season infectional or Lateral production in that specific Location is arrested by it and this is observed specially in skin diseases prominently.
5. Leech introduction for lids side effects in the disease like diabetes bone fracture, paralysis, rheumatism, wound and odema due to trauma.

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7. How does leech alone act successfully in all of these various diseases?

1. Acharya sushrut, as it were to answer this question says as follows.
2. Disease - creating invisible elements increasingly shelter in visible blood by expelling it, these invisible bodies also get expelled and the blood begins to circulate again naturally this is termed as in Ayurved i.e. removing obstacles.

3. All these seemingly different ailments undergo the same stage which is called i.e. inflammation this is preliminary and inevitable stage in all of these disease and Leech application is its prominent and successful remedy. Encompassing capacity of a Leech is thus proved sushrut says.

This means blood should be sucked out in the preliminary stage of inflammation, as it silences pain and arrests further development.

8. HIV and or Sterilization and Jalauka?

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1. The expanding ingredient in the saliva of a Leech destroys, micro-bacteria.
 2. Arrests infection.
 3. Leech application is prescribed in venereal diseases also.
- The above mentioned points are corrects still it is better.

1. to have a HIV test performed.
2. to use an applied Leech not again.

There is a vast scope for the investigation of Leech application In AIDS. Work on this topic.

It is a Misunderstanding that Ayurved neither, knows surgery nor, sterilization it is not so has described about sterilization quite enough.

In Leech application also sterilization necessary the Leech to be applied, the specific spot where it is applied, application procedure, once applied Leech all these topics are taken into consideration and described scientifically in through sterilization view point.

In short HIV test is necessary in Leech application.

9. Follow up?

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1. Ayurved is a complete science in itself still it should be up to date to face with modern time.
2. All necessary pathological test should be carried out before applying leech.
3. pre-application symptoms, post-application symptoms and those when leech is sucking the blood should be observed and recorded.
4. Complete record of the Leech once applied also should be maintained till it is disinfected for reapplication.

In short, follow up is important in Leech-application also.

A Physician is responsible for the healthiness of the society, as he is a respected figure of it.

In short HIV test is necessary in Leech application.

Jalauka (Leech) - A Para-Surgical Sharp Instrument

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1. What is 'Anushastra'?

1. 'Anushastra' is a specific concept in Ayurvedic surgery
2. 'Anushastra Karma' means Para surgical process
3. Shastra means sharp instrument twenty such instruments are mentioned in Ayurved eight types of surgical process are performed by in not a though it acts like wise is
4. 'Anushastra' though subordinate has its own importance where surgery is necessary but dangerous and difficult acts there successfully and what is more without side effects.
5. And therefore should be used in case of infants and those who are afraid of surgical operation says

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2. How Jalauka is operated as a sub-ordinate instrument?

1. eight type of surgical operation are mentioned in Sushrut Sanhita out of then there types namely (incision) (puncture) and (Drainage) could be performed alone by
2. The Jalouca cut has its own peculiarities.
 - a. It is sterile.
 - b. it heals up quickly due to its 'y' shape
 - c. it is clustered with a dermis -coat within 24 hours which arrests infection.
 - d. It heals up quickly and there is no possibility of complications what so ever.
 - e. No sign of the cut remains after wards no doubt this treatment is cosmetic in Ayurvedic terminology.
3. No need of post-operation T.T. Antibiotics pain-killers anti inflammatory etc. after Leech application.
4. No need of Anesthesia.

5. one of the plus points of a good surgeon is assumed. Minimum incision Leech incision is remarkably tiny.
 6. Leech-application is no doubt a closed method
 7. Surgery can be operated through a tiny cut also
 8. External media- the skin is suffice for this operation
 9. If we adopt this procedure diseases like gangrene, could be cured without amputating selecting parts of the body.
 10. Several stages or steps in surgery could be avoided
 11. With these appliances, specially Leech, the passage of time could be shortened in surgical operation.
- In short nearly in all surgical cases Leech application is a flawless and better remedy no doubt.

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3. Quite some of the cases where Leech-application was performed?

1. I have performed Leech-application in all disease mentioned in Ayurvedic Surgery.
2. Where was not favorable but was necessary side-effects after various branches of surgery just as Arthro, Ophthalmic, Plastic, E.N.T., Dental, Neuro, plastic, breasts Ano Rectal - Leech - Leech application was performed in all of these conditions and spots.
3. Gangrene, all types of wound (Swelling) (Tumor), post-products of diabetes, (malignant growth) Ano-rectal disease, (Abscess) thyroid, (ophthalmic disease), (diseases of ear) (fracture) (Sciatica, paralysis Rheumatism etc.) Dumbness, (Dizziness) etc. are some of the disease, where Leech-application was performed.
4. Some of the cases
 1. Wet-gangrene- A patient from Gondia. Age-60 hospitalised, undergone the modern treatment in plastic surgery unit at Nagpur. Toe of one foot was amputated. He was heart patient, condition was critical advice to amputate the foot at this juncture the patient was admitted to my clinic-Leech application was introduced to him critical symptoms disappeared within three days and healing of the wound also started within two months, patients was cured completely without amputation.
 2. Another case of an eye-lid half portion of the eye-lid was stricken off is an accident. (eye-lid excised wound) plastic surgery was advised instead of it. I have introduced Leech-application, immediately over night patient responded within seven days lost portion of the eye-lid rejuvenated.
 3. A child five years old was dumb by birth after Leech application the child started pronouncing the words within fifteen days.
 4. Accidental deafness was cured.
 5. Leech-application on thyroid gland externally was also successfully surgery then was not needed.
 6. Sebaceous cysts pertaining to head, neck and back were rooted out with capsule.
 7. A case of knee-joint Replacement of kneecap was advised. Instead of it, he was undergone Leech treatment knee joint started to function again.

In short I am introducing Leech-treatment for last ten years in several disorders of various branches of Result are encouraging.

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4. Do you take resort to procedures others than Leech?

1. Yes, At times in certain disease.
2. In the disease like cyst, (tumor), (gangrene) (growth) Keloid - also was introduced.
3. Seemed to be helpful as a post treatment in fistula.
4. Was executed along with Leech in skin-diseases.
5. While treating some of the prolonged ailments like diabetes it was observed that along with Leech another forms of are of a great use but in diseases like, piles, fisher, etc. Leeches alone had finished the job.

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5. Can we operate Leech in surgical emergency?

1. Yes, it can be
2. If there is a wound in any vital organ, say head and excessive bleeding starts, which is fatal leech application is a quick remedy. It is proved.
3. Piles is also a disease of vital organ-Anus. In its fatal condition, Leech is a proved remedy.

4. In Acute appendicitis is a critical disorder. In its attack Leech is a sure and quick remedy substitute for emergency surgery can be postponed cancelled at times.
 5. Gangrene can be totally cured Amputation of the part can be disbarred.
 6. Some time heart function becomes troublesome due to severe pain at this junction Leech application is a sure and quick solace.
 7. Disorders like poisons, wound infection, burns etc. could be corrected by Leech for example dog bite.
- In short in surgical emergencies, Leech is a Devine boon and life savings being a live instruments as it were.

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6. What about other factors of this Leech treatment? Bay - economy, availability, approach, site provision assistances tools - so an and so forth?

1. This treatment is really a boon to the poor classes of the society.
2. It is much inexpensive.
3. It is a short time treatment.
4. Patients routine activities are not disturbed while he is under treatment.
5. It is easy - going and non-restrictive, what so ever.
6. In case only single - day hospitalization of the patient in sufficient.
7. This treatment can be conducted easily in O.P.D.
8. Pre-surgery arrangements like Anesthesia etc. are not necessary.
9. Post-surgery medication like costly antibiotics etc. not necessary.
10. Patient does not feel even that he had gone under a major operation.
11. In gangrene like cases patient has not to suffer the loss of certain limb as it is not amputated.
12. Leech when applied operates cutting no doubt but this cutting is executed easily no time and painless.

The village Aries in our country are not well - equipped with necessary needs like food clothing and shelter, what to say about medical aid. In these Aries Leech is no doubt a boon through the incentive of saint Laharibaba a Leech - Camp was organized at Kamtha - a village territory in Gondia district that was my first experiences of camp-working. Recently afterwards in a forest area of northern India at Arogya Dham, Chitrakoot a grand camp was organized guided by revered Nanaji Deshmukha under the auspicious of Deendyal Research Institute. It was an honor to me to participate in it. It was a grand success. Response to Leech treatment was hearty and healthy two inquisitive medicos from England were present there not only pleased, but both of them were much impressed also by the novel Leech treatment.

And now, at this juncture I wish to make a humble suggestion Leech treatment is enormously useful and profitable to society. We have been it so a regular, research and ardent investigation must be promoted in the subject of the reasons may be as follows.

1. Leech is one of the victorious weapons of indigenous medicine, which is keenly related to life.
2. We the students of Ayurved should not only be proud of the fact that Leech treatment is originally the product of Ayurved. We should not stop there.
3. At present in the light of modern sciences, with the co-operation of other patsies, we should investigate this Leech-phenomenon in all possible angles and be progressive in its usefulness that will be the light benediction to the god father of surgery i.e. He has cautioned as already.

i.e. "one should not restrict his studies to his our systems only in orders to understand its vast scope be should his acquaintance with other system also" and this in tune of the saying of a Vedic sage. i.e. "Let noble thoughts come to us all over the globe"

Leech-treatment oriented in Ayurved is as it were a cave of Ali-Baba. A keen and composite research work is the only key to open it. We the students of Ayurved are duty-bound to furnish it.

"Let Doctor Leech be at your door. Your name will be healthy and happier"

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Research

"Studies Regarding Efficacy Of Jalauka (LEECH) As a Surgical Tool in Shalyakarma Of Bhagandar (FISTULA IN ANO)."

PURPOSE - Studies regarding efficacy of Jalauka (LEECH) as a surgical tool in Shalyakarma of Bhagandar (FISTULA IN ANO). JALAUKA - a slimy ectoparasite from phylum annelida lives in water sushrut samhita is an authentic text for surgery, one of the important scientific topic about jalauka therapy is namely Jalaukavacharniya

METHODS - Leech in one of the main anushastra. Bhagandar in one of the surgical disorder of vital organ. Being a vital organ & surgical disorder leech can play main safe role in the line of treatment of fistula in ano . first stage of fistula in ano is deep seated Vrana-Shotha

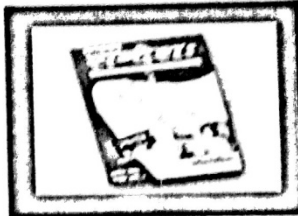
RESULT - Blind external fistula in ano is complicated than blind internal fistula in ano . in this condition , leech is the best anushastra for I & D without complication. Ksharsutra chikitsa is proved scientifically for fistula in ano . if leech help can be taken in pre operative management then we will get best result . leech is the best remedy because Bhagandar is surgical disorder of guda marma.

CONCLUSION - Leech is the best of one anushastra. Main aim & object of ayurved is to prevent disease by birth & for that panchkarma related according to season is the best solution . Bloodletting is one of the main panchkarma for surgical disorder. Ex. Fistula in ano clinically Jalauka is proved best surgical tool in Bhagandar especially in pre operative condition of fistula in ano without complication.



Topic

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Research

Leech – a miracle ?

Leech, hirudo – medicinalis, a small but important creature from water for today's medicinal world. No doubt we Indian student of Ayurved feel proud of Leech, because Leech is Indian and Ayurvedic. God – father of surgery, Sushrut and Sushrut – Samhita is an authentic and first stone basic text for surgery. Everything about Leech is mentioned scientifically & basically mentioned there. Leech is mentioned as one of the & best – one sharp – para – surgical instrument and it is proved today.

Life threatening conditions, complications, All surgical disorders, surgical disorders of vital organs mainly, Leech can be proved as the best divine boon for surgical process.

If, we study in detail; Kshudra-Roga; it can be related with skin disorder or dermatology branch mainly.

At every stage of surgery, that is, pre-operative, post-operative stage, leech can be useful very well with safe and best results without complications. Cosmetic surgery is one of the important branch of surgery today. Leech can be the best cosmetic.

Anesthesia is the important need of today's surgery. Leech – saliva contains anaesthetic chemical or Leech is the live anaesthetist. Shuddha vrana by surgeon or sterile-incision is the basic step of every surgery. Leech-incision by Doctor is tiny and ? shaped and cosmetic also.

Blood letting is one of the main line of treatment of every surgical – disorder mainly in plastic – surgery. Leech is Blood- sucker and roots out the cause of surgical – disorder.

Vrana- shotha or inflammation is the basic surgical disorder & leech is the best anti-inflammatory, live, safe- antibiotics also. At every stage of surgical- disorder, that, is IS?> {H*§' mH\$mb or acute, chronic, Leech can be proved as a best remedy no doubt. ' Health is better than cure, is the basic aim & object of Ayurved, Though it is blood – sucker by nature, can do this job very well in all surgical disorder as a preventive measure in all surgical disorders by birth.

Is Leech – a miracle ? No, No, doubt. Leech- Hirudo – medicinalis is a divine – universal truth for medicinal world from deity of medicine – God Dhanwantari!

Alone, Leech can be a best divine boon to all Kshudra-Roga.



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- [Hernia – Operation](#)
- [Leech and Kshudra-Roga](#)
- [Leech – a miracle ?](#)
- [Non- healing to Healing](#)
- [Inflammation and Leech](#)
- [Leech and Siravedha](#)
- [Leech : Hair Care](#)
- [Useful in Useless](#)
- [Bleeding Flowers](#)
- [Diabetic Foot](#)
- [Varicose Veins](#)
- [Gout and Leech](#)
- [Leech a Novel Surgery](#)
- [Welcome back! "Indian Dr. Leech"](#)
- [Leech and Arthritis](#)
- [Leech and Gout](#)

CURRICULUM VITAE



SHRIRAMJI GIRIJASHANKAR JYOTISHI

M A (Pub Admn)

M Sc (org Chem)

Road,

Ph D (Pharma Sc)

440027.

Visiting Prof.,

Mahatma Gandhi Ayurved College, Hospital and
Research Center, Salod, Wardha, Maharashtra.

Residence: 50-51, Gurukrupa society,
Naik Nagar,
Manewada Ring

Nagpur.

Contacts: shriramji_j@rediffmail.com.

09850333408 - (M)

0712-2741772 - (R)

Born on 11th Dec. 1954, joined Shri Ayurved Mahavidyalaya, Hanuman Nagar, Nagpur-23, on 14th Dec 1978 as lecturer and retired as Asstt. Prof. on 31st Dec 2014. Later joined M G Ayur. College, Wardha, as visiting prof.

Research Activities:

A. Exploration of the Ayurvedic principles and providing laboratory experiment based evidences to the same, along with the study of the chemistry of *Ekal Avushadhi Dravya* and some formulations with SOP, was the main objective, and it was met by designing and performing experiments for M.D. (Ayu.) projects as coguide. 70 such projects have been completed so far. Some of them are as follows:

- ❖ Animal model designed for the study of *Shadharas Siddhanta*.
- ❖ *In vivo* experiment to study effect of *Agneya dravya* on body development.
- ❖ *In vitro* experiment to study effect of *Agneya dravya* on *Paka Kriya* (enzymatic study).
- ❖ Laboratory experiment on the effect of varying *Panchmahabhautic* environment on the growth of plant.
- ❖ Scientific approach to study *panchmahabhautic* concept with related laboratory experiment.

- ❖ Effect of standardized *Dhooopan* on some of the biological and biochemical factors of human body (enzymatic study).
- ❖ Studies correlating *Tridosh* and biochemical values (repeated experiments with different design to check the reproducibility).
- ❖ Chemical studies correlating *Dhatusarata* and *Dhatumal*.
- ❖ Development of colorimetric method to study *Twak Snigdghata*.
- ❖ Experiments to study the performance of *Udana Vayu*.
- ❖ Effect of *Bruhana Snehana* on serum lipid level.
- ❖ *In vitro* study of *Laghu* and *Guru goma* of milk of different animals (enzymatic study).
- ❖ *In vitro* study of *Laghu* and *Guru goma* of old and new *Ahara dravya*.
- ❖ *In vitro* study of *Guruta* due to radish.
- ❖ Experiments regarding scientific concept behind addition of *Tulsi* to cooked food and water.
- ❖ *In vitro* studies regarding *Vipak*.
- ❖ Various marketed samples of *Vanaushdhis* have been analytically compared with authentic samples (variations have been observed even with locality i.e. *Desh*).
- ❖ Study of large number of *Ras Aushadhis* for SOP along with the Chemistry of the products and their standardization with respect to Ayurvedic parameter, and further their comparison with marketed products.
- ❖ Chemical studies related to *Shodhan Sanskar* of toxic drug, testing toxic principal in self-prepared and marketed samples with respect to forensic science.
- ❖ Relative extraction rate of toxic principal by simulated gastric juice in presence and absence of (so called) antidote
- Etc.

B. Myself, the first and the single person, when appointed in the college, was handed over the responsibility of establishing a laboratory, which was later converted into a Central Research Laboratory and during this responsibility, I designed/fabricated/assembled following instruments/apparatus most economically:

1. Chilled water circulation tank.
 2. Bunsen electric.
 3. Thermostate.
 4. Hot plate (Thermostated)
 5. Magnetic stirrer with hot plate.
 6. Oil bath (electrical).
 7. Sand bath (electrical).
 8. Steam generator with pressure control.
 9. Stirring motor with stand.
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BIO-DATA

PERSONAL INFORMATION

NAME: DR. SHRADDHA SUSHANT SAKHARE

DESIGNATION: READER-P.G. GUIDE IN SHALYA-TANTRA DEPARTMENT
HON. SHREE. ANNASAHEB DANGE AYURVED MEDICAL COLLEGE
AND RESEARCH INSTIUTE , ASHTA DIST- SANGLI TIN - AYUSHT0576

REGISTRATION NO: I 26526A-1 DATE: 1 JULAY 1994

DATE OF BIRTH: 25.09.1970

PRESENT ADDRESS: ASHTA STAFF QUARTER

PERMENANT ADDRESS: 47. KUKDEY LAY OUT , NAGPUR .PIN 440027

CONTACT NO.: 9326827421

GENDER: FEMALE

MARRITEL STATUS: MARRIED

KNOWN LANGUAGE: MARATHI, HINDI, ENGLISH, SANSKRIT

NATIONALITY: INDIAN

EDUCATIONAL QUALIFICATION :

Sr.No.	Course/Exam	Name of Institute/Board	Year of passing	Grade/%
1.	S.S.C.	Maharashtra State Board	1986	Ist 71.71
2.	H.S.C.	Maharashtra State Board	1988	Ist 70.83
3.	Ist B.A.M.S.	G.A.C.N. Nagpur University	1990	Ist 64.00
4.	IIInd B.A.M.S.	Nagpur University	1991	Ist 62.00
5.	Final B.A.M.S.	Nagpur University	1993	Ist 60.00
6.	P.G.	G.A.C.N. Nagpur University	1997	

EXPERIENCE:

1. House Officer: Shalya -tantra G.A.C.N.1994 For six months
2. House Officer: Prasuti-tantra & Strirog G.A.C.N.1995 For six months
3. Medical Officer: Smruti Trust Hospital , Nagpur . Worked as assistant Surgeon
from 1995-1997, on call for 6 years
4. Medical Officer: J.A.M.C. Nagpur from 26.6.2003 to 2.2.2010
5. Lecturer: J.A.M.C. Nagpur, approved teacher from 3.2.2005- 8.7.2010
Total period 5years 5months 5days
6. Reader: Shree. K.R.Pandav Ayurved college, Nagpur, approved teacher from
9.7.2010-18.4.2012 Total period 1year 9months 10 days
7. Reader: Hon. Shree Annasaheb Dange Ayurved college and Reasearch institute, Ashta
Approved Teacher for U.G. & P.G. from 19.4.2012 upto till date,
total period 4years 1month uptill, **inciuding all total exprience 10years 9months**
- 8.Examier: **M.U.H.S. Approved examiner for U.G.&P.G. SHALYATANTRA from Yr 2012 uptodate**
- 9.Clinical surgical exprience: **Siravedh & jalouka especially in surgical diseases.**

EXTRA CURRICULAM

- * Music- Sangeet Madhyama purna exam passed, from Akhil Bhartiya Gandharva
Mahavidyalaya,Bombay
- * Sport-Carrom competition Chandrapur, winner 1992
- *Sport- Carrom Competition J.A.M.C. Nagpur winner-2006
- *Carrom competition J.A.M.C. Nagpur winner- 2008
- * Carrom competition J.A.M.C. Nagpur winner-2009
- * Carrom competition J.A.M.C. Nagpur winner-2010

PAPER PRESENTATION & PUBLICATION:

**National scientific seminar On sport medicine March 2006 Dept of Ayush*

**Soshruiti- 2007 International conference, Udupi, Dept of Ayush*

**National Seminar Shree Ayurved College, Nagpur, Dept of Ayush*

**Inter national Seminar oct 2014 Shree Ayurved college, Nagpur, Dept of Ayush*

**National Seminar Dec 2014 A.D.A.M.C. college, Dept of Ayush*

**National Seminar oct2015 Shree Ayurved college, Nagpur , Dept of Ayush*

**JASSN International journal A.D.A.M.C. 2016*

Traimasik Jivanutsaha published by shreesurya ,Andheri west, Mumbai

**2010*

**Jan feb march 2011*

**Oct Nov Dec 2011*

**News paper Loksatta 2011*

DELIGATE PARTICIPANT:

**National Seminar on Evidence Based Leech application 20th oct 2013 Poddar Medical college
Worli, Mumbai*

**National workshop on Surgical Anatomy in Ayurved, Salod, wardha, 5th April 2008*

*Regional Reasearch Institute - Ayurveda, Nagpur. CME on Parasurgical technique (Ksharsutra)
20th-22nd oct 2008*

**Maharashtra Council of Indian Medicine CME 21st march 2010*

**CME ON ORAL CANCER 4TH FEB 2011*

**Head & Neck oncology workshop on 16th jan 2011*

**Maharashtra council of Indian MedicineCME 24th June 2012*

**PDL Maharshi Arvind foundation 2nd feb 2014*

**6th World Ayurved congress & Arogya Expo 7th-9th Nov 2014, New Delhi*

**State level Seminar on current education policy of India 10th Aug 2012*

**National scientific seminar on The role of Ayurved in sport medicine 25th-26th 2006*

**National Seminar on Role of Ayurveda in Prevention and management of life style disorder
7th to 9th oct 2012*

**National Seminar on Vandhyatva 11th Dec 2014*

**National seminar and workshop on Rasoushadhi 9th&10th oct 2015*

**workshop and International conference on shalya tantra 14th-16th Dec 2007*

**International Seminar on Recent Advances in Herbal Medicine 11th&12th oct 2014*

**Workshop on HF Care Hospital; Nagpur*

TRAINING PROGRAMME:

**Training orientation and Research center for National Seavice scheme 15th-24th Jan 2008*

**Medical Education unit, Indira Gandhi Govt. Medical College, Nagpur 27th- 29th Aug 2008*

**Teachers Reorientation Training Programme 2nd-7th Jan 2009 G.A.C.Osmanabad*

**Reorientation Training Programme of Ksharsutra Therapy 4th-9th Jan 2010 B.H.U.*

**Teachers Reorientation Programme of Ksharsutra 22nd-27th Feb 2010 mumbai*

**Basic Workshop in Research Methodology 18th-20th 2012 A.D.A.M.C.Ashta*

***LIFE MEMBER OF NASYA**

Place: Ashta, M.S.

Yours Faithfully

Date:

DR. SHRADDHA S. SAKHARE

