

JALAUKAVACHARANA IN ARSHA W.S.R. PROLAPSED THROMBOSED HEMORRHOIDS - A LITERARY REVIEW

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ABSTRACT

The estimated global prevalence of hemorrhoids is between 2.9% and 27.9%, of which over 4% are symptomatic. Hemorrhoids are swollen or inflamed anal cushions lining the anal canal. Chronic constipation is the most prevalent cause in middle and old age.^[1] Thrombosis in those already inflamed and swollen cushions causes significant aggravation of symptoms of already suffering individuals. Thus continuous search for novel methods of alleviating the discomfort is carried out projecting *Jalaukavacharana* as one of those because of its ease and lesser complication rate.^[2] As this procedure is being described by our ancient as well as counterpart modern scientific scholars, need to explore and validate this methods in today's perspective and measures is preordained. This review is an attempt to that validation by collaborating every available relevant data available to us in every possible reputed sources available across various

platforms whether offline or online on *Jalaukavacharana*, *Arsha* and Thrombosed Prolapsed Hemorrhoids. in a constructive and proactive manner.

KEYWORDS: Jalaukavacharana, Leech Therapy, Arsha, Prolapses Thrombosed Hemorrhoids

INTRODUCTION

When reading the chapter on the treatment of the disease "*arsha*"; *Acharya Charaka* and *Acharya Sushruta*, two ancient medical authorities, have both identified four types of treatments for *arsha*. *Bhesaja*, *kshara*, *agni* and *shastra* are the names of these four treatment

plans.^[3] *Acharya Charaka* has shown more importance on *bhaishajya* treatment (medical treatment). *Bhesaja* denotes usage of medical knowledge as well as the *materia medica* as treatment plans. Whereas *Acharya Sushruta* stresses more about *kshara*, *agni* and *shastra karma*.

Haemorrhoids are considered and dealt rationally under the *arsha* definition, and we are focusing on Prolapsed thrombosed haemorrhoids. Thrombosis is almost always a complaint of large prolapsing second- or third-degree haemorrhoids and is believed to be due to their becoming nipped by the sphincter muscles in prolapsed situation resulting to congestion and thrombosis. As a consequence, hemorrhoidal mass become hard and tender and usually irreducible. In majority of cases, spontaneous resolution is the natural course. After few days oedema and swelling diminishes and thrombosed piles recedes to anal canal. There is also a very rare possibility that after an attack the thrombosis undergoes fibrosis and projects as a large fibroid mass at anal orifice.^[4]

Modern counterpart for the treatment of Thrombosed haemorrhoids is *Emergency Haemorrhoidectomy after injecting Hyaluronidase into the Perianal region followed by Interval Haemorrhoidectomy*. But all these methods have their complications as well as limitations. Post-operative Stenosis or suppurative pylephlebitis, whatever may be the course, there is always some possibility of complications whether minor or major.

Jalaukavacharana is highly claimed therapy because of its safety and high efficacy in the disorders involving the vitiation of blood. It is safely indicated even for the king, rich, old, fearful, weak, women and the people of tender nature.^[2] In Ayurvedic Literature **Jalauka** is for *Avgaadha Rakta nirharan*.^[5] Thrombosis which is the main concern here is *Avgaadha Raktha* thus the basis of review.

MATERIALS AND METHODS

All relevant ayurveda texts, modern literature, journals and scientific research papers were studied to extract this data regarding this topic.

DISEASE REVIEW

a) ayurveda literature

Arsha is characterized by the presence of *mamsankura* at the *guda bhaga*. It is the area of concern since the time immemorial. Because of its severity, it is considered as one among the *Ashta Mahagada*.^[6]

Due to its *swabhava*, *arsa* is difficult to treat completely. It may torture the patient as an enemy hence the nomenclature *arsha* is given.

Historical Aspect

1. **Vedas – In Atharva Veda** this disease has been described as *Durnam*.^[7] Reference of disease is also available in **Rigveda**, which gives reference of treatment for diseases which originates in *guda*.^[8] **Krishna Yajurveda** and **Shukla Yajurveda** have also mentioned *arsha* with its treatment.^[9]
2. **Garuda purana** has described *arsha* with other diseases.^[10]
3. **Charaka samhita** (1000 B.C.) - In *Chikitsa sthana* 14th chapter **Acharya Charaka** has mentioned details and probably the earliest record of *arsha* regarding its etiology, pathogenesis, clinical features, different types of treatment and other complications. **Acharya Charaka** has mentioned the role of *Jalauka* in *arsha*. But regarding surgical treatment **Acharya Charaka** has referral to *Dhanvantaries*.^[11]
4. **sushruta samhita** (800–1000 B.C.) - It includes a detailed and the systematic record of *arsha* regarding its etiology, pathogenesis, clinical features, different types of treatment and other complications. The contribution of four-fold treatment of *arsha* is very authentic. **Sushruta** has described its management for curing the disease which includes the surgical and para surgical methods along with the herbal treatment.^[12,13] The amount of information about *arsha* contained in this *samhita* is so adequate that it has not been surpassed yet despite enormous technological and scientific advancement in the field of modern medical sciences.
5. **Ashtanga hridaya** (7th A.D.) – **Acharya Vagbhata** has given a very meaningful description as “when muscles like fleshy projections kill the life like an enemy and create obstruction in the anal passage, they are called *arsha*.”^[14]
6. **madhav nidana** (800 AD) – **Madhu kosha** defines *arsha* as a disease, which tortures the life like an enemy and kills. Etiology, symptomatology, prognosis of *arsha* is well described in *Madhav Nidana*.^[15]
7. **chakradutta** (1100 AD) -**Chakrapani** has described about application of *Ksharsootra* in *Arsha- Bhagandara Chikitsa*.^[16]

8. *sharangdhara samhita* (1300 AD) – *Sharangdhara* has described 2 types (*Sahaja, Ut-tarjanma and Sushka, Adra*) and 6 types of *arshas*.^[17]
9. *bhaishajya ratnavali* (1800 AD) – Variety of treatments is described in chapter 9 of this text for the treatment of *arsha* under *Arsha Chikitsa Prakrana*.^[18]
10. *bhava prakash* (1600 AD) – In *Arsha Adhikara* chapter – definition, sign, symptoms, types, treatment, *pathya-apathya* and prognosis of *arsha* are described.^[19]
11. *yog ratnakar* (1700 AD) - Description of many aspects of *arsha* is described in chapter 5.^[20]

McDonnell in his book named "*Vedic Index of Names and Subjects*" has quoted the word *Arsha*.^[21]

Classification of *Arsha*

1. on the basis of the origin.^[22,23]

1. **sahaja arsha** – It is considered to be congenital anomaly due to disorders of paternal and maternal chromosomes. It is very difficult to diagnose because of its different size and shape.
2. **janmottara kalaja**– It occurs due to the malpractices in daily life like faulty food habits and regimen.

2. on the basis of the bleeding nature^[24]

Acharya Charaka has stated these two types.

1. **aardra** – It is also called as *Ravi*. They are bleeding piles due to vitiation of *Rakta* and *Pitta* mainly.
 2. **shushka arsha** – They are non-bleeding piles due to vitiation of *Vata* and *Kapha*.
3. on the basis of the predominance of *dosha*.^[12,11,25,14,15,17,19]

It is mainly sub division of the *Janmottara kalaja* type of *Arsha*

S. No.	<i>Arshas</i>	<i>Su.Su.</i>	<i>Ch.Su.</i>	<i>A.S.</i>	<i>A.H.</i>	<i>Ma.Ni.</i>	<i>Sha.S.</i>	<i>Bh.Pra.</i>
1.	<i>Vataja</i>	+	+	+	+	+	+	+
2.	<i>Pittaja</i>	+	+	+	+	+	+	+
3.	<i>Kaphaja</i>	+	+	+	+	+	+	+
4.	<i>Dwandaja</i>	+	+	+	+	+	+	-
5.	<i>Sannipataja</i>	+	+	+	+	+	+	+
6.	<i>Raktaja</i>	+	-	+	+	+	+	+

7.	<i>Sahaja</i>	+	+	+	+	+	+	+
8.	<i>Sushka</i>	-	+	+	+	-	+	-
9.	<i>Ardhra</i>	-	+	+	+	-	+	-

Six types of *Arshas* are mentioned similar to *Charaka* are in *Harita Samhita*^[29] and *Vangasen Samhita*^[30] as well.

4. on the basis of site^[23]

1. *bahya*
2. *abhyantara*

Sushruta has used the word *drishya* probably to denote *arsha* occurring in *bhaya vali* and *adrishya* arising from *madhya* and *antarvali*.

5. on the basis of prognosis

1. **sadhya** variety (Curable)^[25]-If the *arsha* is located in the *samvarani* and is of single *doshika* involvement and not very chronic, then it will be *sadhya*.
2. **kastha sadhya** (Difficult to cure)^[26]-If the *Arsha* is caused by the simultaneous vitiation of any two *doshas* and *arsha* is located in the second *vali* (*visarjini*), the chronicity of the disease is more than one year, it can be considered as *Kastha sadhya*.
3. **yapya variety** (Palliative)^[26]-If the *arsha* is caused by the vitiation of three *doshas* but symptoms of *doshas* are minimal, it can be considered as *yapya* variety.
4. **asadhya variety** (Incurable)^[26]-*Sahaja arsha* is incurable, if caused by the vitiation of three *doshas* and the *arsha* is placed in the internal *vali* (*pravahini*). In addition to this, also if the patient develops Oedema in hands, legs, face, umbilical region, anal region and testicles. If the patient suffers from pain in the cardiac region, it is considered as incurable^[27].

Sushruta has mentioned *arshas* associated with *trishna*, *aruchi*, *shula*, excessive bleeding, *shotha*, *atisar* will kill the patient^[28].

6. on the basis of management^[31]

On the basis of the treatment, *arsha* can be classified into four varieties as follows:

1. *bheshaja sadhya Arsha*
2. *kshara sadhya Arsha*
3. *agnikarma sadhya Arsha*
4. *shastra sadhya Arsha*

b) modern Literature

Proctologic conditions and their treatment have a long history. Hemorrhoids were mentioned in ancient Egyptian, Greek, Hebrew and Indian writings. In Babylon in 2250 BC, it was in The code of Hammurabi.^[32] They stressed the importance of local polypharmacy in the treatment of hemorrhoids, such as the use of alum as an astringent in the treatment of hemorrhoids (1700 BC). Forcible dilatation was also practiced by the ancient Greeks. This disease was also known to Hippocrates (400 BC).^[33] These hemorrhoids were referred to as condylomata by Celsus of Rome (25 BC to A.D. 14) in *De Medicina*.^[34] In 1879 Andrews of Chicago.^[35] has defined *sclerotherapy* with phenol injection in hemorrhoids. Solution used in sclerotherapy are 5% solution of quinine and urea hydrochloride in water [1917], 7% Alcohol Base [1922], 5% sodium morrhuate in benzyl. Alcohol was tried by Bobsen [1949].

Albright's solution, or 5% phenol in arachis oil with 2 gm camphor in an ounce, is a natural agent. Black Wood Mitchell [1903] of Clinton was most likely the first to use this approach in the United States. It was popularized by Kelsey (1883), Martin (1904) and Albright Blanchard (1928). Millian (1939, 1943), Cheng *et al* (1981), Goligher *et al* (1984), Khoury *et al* (1985) and others compared injection therapy to other types of treatment. Anal dilatation has been identified as a treatment for hemorrhoids by Recamier (1829), Massonneuve (1864) and Lord (1968, 1969).

Sphincterotomy was first described by Dupuytren (1833) and Bodenheimer (1868). Whithead (1882) called for complete pile bearing field excision and primary suture. The V-shaped low ligation and excision procedure was described by Miles (1919). Milligan and Morgan (1937) identified a low-ligation, excision procedure with mucosal cover preservation. “*Grab & Smash Hemorrhoidectomy or 5 Minute Job*” was the moniker given to this technique.

Park suggested submucosal hemorrhoidectomy in 1956. Excision of individual piles with suture over a clamp was popularized by Mitchell (1903), Earle (1911) and Baron (1949).

Blaisdell (San Francisco) rediscovered band ligation as a mucosal fixation process in 1954. Internal hemorrhoid was ligated with silk in the upper, insensitive aspect of the anorectum. Barron (1963) made instrument and did procedure corrections. Barron made a sturdy instrument for strangling the base of the vascular cushion with tight rubber bands. McGiveny, Van

Hoorn (1972), Thomson (1980) and Schofield (1980) all made significant changes to the instrument and the technique (1984).

Ferguson preferred for closed hemorrhoidectomy (Ferguson & Heaton 1959, Ferguson *et al* 1971, Ganchrow *et al* 1971). Cryosurgery was described by Fraser and Gill (1967), but it was abandoned due to the negative effects of pain and discharge. Infrared coagulation was invented by Nath *et al* (1977) and Neiger (1979). In the year 1990, G. Allegra used a stapler for hemorrhoidal surgery for the first time at the University of Florence in Italy.^[36]

etymological derivation

The word 'Hemorrhoids' is derived from Greek word *Haima*(bleed) + *Rhoos* (flowering), means bleeding. The Pile is derived from the Latin word '**Pila**' means Ball.

Definition

Hemorrhoids occur through vascular hyperplasia in the anal submucosa, possibly through dysfunction of the shunts.^[37]

Hemorrhoids are the secular dilation of the terminal part of the hemorrhoidal venous plexus lying in the submucosa of the upper anal canal just above the mucocutaneous junction.^[38]

Internal hemorrhoids, which are the varicosities of superior (internal) hemorrhoidal plexus of veins, can be divided into 2 types.^[36]

1. **vascular** – In this condition extensive dilatation of superior hemorrhoidal venous plexus occurs. It is common in younger persons particularly males.
2. **mucosal** – It occurs due to sliding downwards of thickened mucous membrane. It is Common in old patients. Here the thick mucosa conceals the underlying veins.

Haemorrhoids are symptomatic enlargements of the internal haemorrhoidal venous plexus.^[39]

Hemorrhoids are dilated veins within the anal canal in subepithelial region formed by the radicals of the superior, middle and inferior rectal veins.^[40]

At last, Hemorrhoids can be termed as 'Hemorrhoids' are dilated, tortuous or varicose veins occurring in relation to the anus and originating in the subepithelial plexus formed by radicals of the superior, middle and inferior rectal veins.

Classification

To classify the disease in general, various methods are used. The primary goal of this attitude is to gain precise knowledge of the disease process in terms of pathological and anatomical knowledge, but another significant rule of the classification appears to be in terms of management. As a result of this ideology, a new pattern of disease classification has emerged, which is also true of the disease hemorrhoids. As a result, the disorder hemorrhoids is generally classified as follows:

a. according to site of origin of hemorrhoids^[36]

1. internal
2. external
3. interno-external

1. *internal hemorrhoids*- Internal hemorrhoid results from the varicosity of the internal hemorrhoidal plexus. These are vascular anal connective tissue cushions arising from the lower part of rectum at anorectal ring and upper half of anal canal above the dentate line. Internal hemorrhoids are formed proximal to the dentate line and beneath the rectal mucosa. Normally internal hemorrhoids are not visible on external inspection. Internal hemorrhoids are always diagnosed with the help of proctoscope. Internal hemorrhoids have marked bluish discoloration, multiple thrombosis, ulcerations and gangrene in varying degrees & combinations. Graham Stewart (1963) divided internal hemorrhoids in vascular and mucosal. According to the current literature the hemorrhoids covered by mucous membrane are known as internal hemorrhoids.

2. *external hemorrhoids*- These results from the varicose condition of the external hemorrhoidal plexus. The external hemorrhoidal plexus is placed below the dentate line and around the perianal region. They are covered with skin through which the blue. They are acute, thrombosed, external skin tags. Chronic external hemorrhoids present little or no deformity at the anal outlet, whereas on straining engorgement of hemorrhoidal veins may occur. According to the current literature the hemorrhoids covered by skin are known as external hemorrhoids.

thrombosed external hemorrhoids- Acutely thrombosed external hemorrhoids is the swelling which involves the anal tissues. The varicose condition of the external hemorrhoidal plexus is very much prone to get infected and once infected, results into the rupture of the varix followed by the extravasation of the blood, so an acutely painful swelling develops.

3. **interno-external hemorrhoids:** When the internal hemorrhoidal plexus and the external hemorrhoidal plexus of the corresponding segment of the anal canal participate in the process of varicosity, it results into interno-external hemorrhoids. Thus, when position of hemorrhoid is in internal and external portion they are known as interno- external Hemorrhoids.

2. according to pathological anatomy

1. Primary

2. Secondary

1. **Primary Hemorrhoids**-These are three in number seen at 3, 7 & 11 o'clock positions. This arrangement attributes to the termination of superior rectal artery which divides into right and left main branches. The left branch continues as a single vessel and terminates at 3 o'clock, whereas the right branch divides into two branches, one terminates at 11' o'clock [anterior branch] and the other terminates at 7 o'clock [posterior branch].

2. **Secondary Hemorrhoids**-Presence of additional hemorrhoids in between the primary hemorrhoids are known as the secondary hemorrhoids.

C. according to the symptoms (by Gabriel)^[36]

1. First Degree

2. Second Degree

3. Third Degree

4. Fourth Degree

1. **first degree hemorrhoids**- In first degree hemorrhoid, pile mass bleeds but do not prolapse outside the anal canal. The chief complaint of the patient is the typical bleeding pattern while defecating i.e., “splash of the pan”.

2. **second degree hemorrhoids**- Second degree hemorrhoids are those which prolapse outside the anal canal during the defecation but need not to be manually repositioned inside i.e., spontaneous reposition.

3. **third degree hemorrhoids**–They remain prolapsed outside the anal canal during the defecation and needs digital reposition.

4. **fourth Degree Hemorrhoids** –They remain permanently prolapsed outside the anal canal.

D. depending upon the fibrosis and thickening of mucosa (by miles,1939)^[36]

1. primary

2. intermediate

3. secondary

Miles (1939) divided hemorrhoid into following 3 types

1. **primary hemorrhoids** -The three classical positions of the hemorrhoids are 3, 7 and 11 O'clock. They are called as left lateral, right anterior and right posterior respectively. They are due to the main branches of superior rectal arteries i.e., left and right branches. Left branch containing as a single vessel, while the right branch splits into anterior and posterior hemorrhoids.
2. **intermediate hemorrhoids**-These are at intermediate position of primary and secondary hemorrhoids.
3. **Secondary Hemorrhoids**- Additional hemorrhoids may be present between these main hemorrhoids like at the position of 2, 5, 9 and 12'o clock position.

E. on the basis of bleeding nature^[36]

1. open
2. blind

It can be classified as open and blind. When hemorrhoids bleed then it is noted as open. In non-bleeding situation it is called as blind.

JALAUKAVACHARANA

a) ayurveda literature

Ayurveda covers a wide range of treatments, including surgical and para-surgical procedures. *Raktamokshana*, or blood-letting, has been used as a para-surgical measure since the beginning of medical history. *Raktamokshana* is a scientific term for a non-surgical technique that uses various methods to remove vitiated blood from specific areas of the body. *Sushruta*, the father of surgery, has described procedures for blood-letting such as *Shringa*, *Jalauka*, *Alabu*, *Ghatyantra*, *Prachhanna* and others. *Jalaukavacharana* (blood-letting by leech) is the easiest, quickest and least complicated of these.

Acharya Sushruta has devoted an entire chapter for the description of *Jalauka* and a chapter on *Jalaukavacharaniya adhyaya* for the purpose of blood-letting. *Jalaukavacharana* is highly claimed therapy because of its safety and high efficacy in the disorders involving the vitiation of blood.

jalauka

The word *Jalauka* is a compound word with two components *Jala* + *Ayu* i.e., the animals having water as the life.

The term *Jalauka* can be split into *Jala Oka* i.e., water dwelling animals.

Definition

Shabdakalpadruma has considered *jalauka* in feminine gender and defined it as an aquatic creature employed to expel out the vitiated blood.

Bhagavad gomandal defines *jalauka* as an animal living either in water or in mud with distended abdomen.

Types of *Jalauka*

Jalauka is of 12 types, out of which six are *savisha* and remaining six are *nirvisha jalauka*^[41].

1. *savisha* (venomous)
2. *nirvisha* (non-venomous)

Each group containing six in number

Acharya Vagbhata further divides the *jalauka* into sex categories. Female *jalauka* are delicate, have thin skin, a small head and a large lower body, while male *jalauka* have opposite characteristics i.e., semilunar in appearance and have a large front section.

toxic effects of *savish jalauka*:

If *Savisha Jalauka* is applied then the person suffers from following clinical symptoms^[42]

- Burning sensation
- Itching
- Swelling
- Drowsiness
- Fever
- Delirium
- Unconsciousness
- Vomiting

indication of *jalaukavacharana*

Sushruta has suggested raktamokshana by *jalauka* especially of children, old aged, weak, females and delicate persons like the king and rich.^[43]

Sushruta enumerated *arshas* as one of the diseases, contraindicated for Blood Letting.^[44]

But in the management of *arshas*, he advised blood-letting under certain conditions like protruded *arshas*.^[45] This controversy was probably intentional because of its limited applicability in the management and unsuitability as a general measure in *arshas*.

Vagbhata^[46] has mentioned diseases where *jalaukavacharana* is indicated viz *gulma*, *arsha*, *vidradhi*, *kushta*, *vatarakta*, *galaroga*, *netraroga*, *visha dansha* and *visarpa*.

Contraindication of *jalaukavacharana*

Contraindication of *raktamokshana* can be considered as contraindication of *jalaukavacharana*.^[47]

b) modern literature^[50]

Kingdom – Animalia **Subclass** - Hirudinea
Phylum – Annelida **Order** - Gnathobdellida
Class – Clitellata **Genus** – *Hirudinaria*
Species - *granulosa*

The Subclass Hirudinea is divided into two groups

- Rhynchobdellida
 - Archynchobdellida
- rhynchobdellida:** "Jawless" leeches, armed with a muscular straw like proboscis puncturing organ in a retractable sheath. The Rhynchobdellida consists of two orders:
- The **Glossiphoniida** (flattened leeches with a poorly defined interior sucker)
 - The **Piscicolida** (have cylindrical bodies and usually well-marked, bell shaped, anterior sucker)

The Glossiphoniida live in fresh water habitats, the Piscicolida are found in sea water habitats.

archynchobdellida: Leeches which lack a proboscis and which may or may not have jaws armed with teeth. Archynchobdellida are divided in two orders- Gnathobdellida and Pharyngobdella.

- **gnathobdellida** - In this order, jaw filled with hundreds of tiny sharp teeth. The incision mark left on the skin is an inverted Y inside a circle.
- **pharyngobdella**- These are present in fresh water 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, tooth less mouth to ingest worms or insect larvae.

bioactive substances in saliva of leech.^[48,49]

1. **apyrase**- Cleaves phosphate from ADP/ ATP
2. **bdellins**- Anti-inflammatory. Inhibits trypsin, plasmin
3. **bufrudin**- Inhibitor of thrombin
4. **calin**- Inhibitor of blood coagulation
5. **carboxypeptidase A inhibitors**- Increases the inflow of blood at the bite site
6. **ceramide glycnase**-Cleaves carbohydrates from glycosphingolipids
7. **decorsin**- Glycoprotein in IIb-IIIb antagonist
8. **destabilase**- Monomerizing activity, dissolves fibrin, Thrombolytic effects
9. **eglines**- Inhibitor of elastase, chymotrypsin.
10. **gelins**- Inhibitor of elastase, chymotrypsin.
11. **ghilanten**- Inhibitor of blood factor Xa
12. **hematin**-Fibrinolysin
13. **hirudin**- Inhibits blood coagulation by binding to thrombin
14. **hirustasin**- Inhibits kallikrein, trypsin, chymotrypsin, neutrophilic,
15. **hyaluronidase**- Increases interstitial viscosity, antibiotic property.
16. **histamine like substances**- Vasodilator. Increases the inflow of blood at the bite site.
17. **pseudo hirudin**
18. **kinases**
19. **collagenase**
20. **triglyceridase**
21. **cholesterol esterase**
22. **lipase and esterase**
23. **leech prostanoids**
24. **local anesthetic agents**
25. **lipolytic enzymes**
26. **dopamine**
27. **serotonin**

Therapeutic properties of leech therapy.^[50,51]

General Reflexogenic	Blood-letting
Internal decongestion	Anticoagulant
Protective antithrombotic	Thrombolytic
Removal of microcirculation disorders	Anti-ischemic
Hypotensive	Immunopotential
Bacteriostatic	Anti-inflammatory
Local anti-edematous	Anti-atherosclerotic
Removal of abnormal infarctions	Analgesic

indications of leech therapy.^[50,51,52]

Chronic bronchitis, pneumonia, bronchial asthma; gastrointestinal tract diseases (hepatitis, cholecystitis, pancreatitis, stomach ulcer); ENT diseases and other teeth diseases; urological diseases, male sterility; skin diseases (neurodermatitis, psoriasis, eczema, herpes); gynecological diseases (gynecological diseases) Infantile cerebral paralysis (ICP) and other diseases.

Bdellotomy is the practice of cutting the *jalauka* open slightly while it is sucking blood to let the blood in it out, so, thinking that it is not full yet, the *jalauka* continues to bite instead of detaching itself. This practice was recorded in 1868.

complications of leech therapy^[53]

- There may be little evidence of disease transmission through leech bites. Leeches are not related to the species that spread rabies or other human diseases, so disease-carrying organisms cannot reproduce within them; additionally, they must eat so infrequently that pathogens will die before being transmitted. There is no chance of infection if the wound is washed. Scratching leech wounds with the fingernails, and thereby contracting other pathogens, appears to be the most harmful procedure. In their guts, leeches hold the bacteria *Aeromonas hydrophilia*, which can be transferred to the patient and cause pneumonia, septicemia or gastroenteritis during treatment. Infections caused by bacteria and other micro-organisms that the leech may carry and pass on. It is recommended that all patients who undergo leech therapy should receive broad spectrum antibiotics to prevent leech related infections.
- Excess blood loss is to be avoided thus it is necessary to monitor the amount of blood removed. Since drop in red blood cell counts can occur in rare cases of prolonged bleeding.

- Allergic reactions such as pruritus (itching), wheal formation and blisters.
- Foreign body reaction against leech jaw that can remain in tissue when leech is forcibly removed.
- Necrosis with chronic progressive ulcer due to presence of toxin or antigens in leech saliva.

limitations and solutions in leech therapy^[54]

Leech gave a miraculous effect in all fields but some limitations or side effects are also there which are summarized below.

The *Jalauka* are very useful in micro-surgical practice i.e., plastic and graft surgery. But there is significant risk of infections

- The leech's natural anticoagulant, hirudin keeps blood flowing for 20 to 40 minutes.
- *Hirudo medicinalis* has endosymbiotic bacteria, so almost 20% of infectious complications are seen after leech therapy. Appropriate antibiotic prophylaxis should be administered to the patient who need leech therapy. Antibacterial agent can be determined by the resistance of the bacterial flora of regional *Hirudo medicinalis*. Aeromonas infections are reported after medicinal leech therapy. Pseudo lymphomas are rare but not worthy side effect of leech therapy.
- As leech cannot be sterilized, historical account warns of the transmission of syphilis, AIDS, hepatitis after the re-application of leeches used on infected patients. So, leeches, after using once, should be disposed of. The leech therapy may not be used in such cases.
- Hemorrhagic disorders (hemophilia)
- Many leeches are held under suspicion to act as vectors for pathogenic organism i.e., *Hirudinaria manilenses* of the Philippines plays the role of carrier of the pathogenic organism of ringer pest disease. The lands of leeches JAVA are believed to transmit the flagellate herpentomonas causing gangrenous ulcers.

CONCLUSION

In the words of Prof. Charles Lent, leading biologist of United States, leeches are useful in removing the blood from areas where tissue has been transplanted because when blood accumulates, tissue can die before it heals. Applying leeches to the area once or twice a day for a week gives capillaries time to grow across sutures and restore blood circulation. Thus, words of Sushruta are becoming a reality even after 2000 years of change of events that the

physician having the art of leech application will be a successful one, crossing the boundaries of time and space.

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