

A REVIEW ON LEECH THERAPY IN VARICOSE ULCERS

Dr Sanghamitra Samantaray¹, Dr Radhakrishna Bishwal², Dr Athulya A³, Dr Dhanya T⁴, Dr Avneet Kaur⁵

¹Associate Professor, Dept of Shalya Tantra, SBSD Ayu. College, Farrukhabad

²Professor & H.O.D, PG Dept of Shalakya Tantra, Uttarakhand Ayur. university

³Assistant Professor, Dept of Shalya Tantra, Dr. Anar Singh Ayu College, Farrukhabad

⁴Assistant Professor, Dept of Basic Principle, Dr. Anar Singh Ayu College, Farrukhabad

⁵Associate Professor, Dept of Kayachikitsa, SBSJS Ayu. college, Farrukhabad

ABSTRACT:

Varicose ulcers (venous insufficiency ulcers) are wounds that occur due to improper functioning of venous valves¹. 70% to 90% of leg ulcers are venous in origin². Venous ulcers develop mostly along the medial distal leg, and can be painful. If not treated properly, the ulcer may get infected leading to cellulites or gangrene and eventually lead to amputation of the limb. Ayurveda also mention about chronic ulcers. In Sushrut Samhita, we get the most scientific description of wound and its management. He has given utmost importance to bloodletting and considered (Leech) jalukavacharan as the most unique and effective method of bloodletting even in infected wounds and abscesses. If the conservative management like compression stocking, foot elevation, antibiotics and regular dressing of wound fails, then surgical treatment like skin grafting, sclerotherapy, laser ablation and other surgical correction were practiced. However, recurrence of venous ulcers is common, ranging from 54 to 78% by the fifth year after healing.

KEYWORDS: Jaloukavacharana, dustavrana, siraja granthi, leech, chronic wound

INTRODUCTION

The varicose veins are like a pressure relief valve because of the back pressure from below veins. Varicose ulcers occur due to increased venous hydrostatic pressure. Generally ulcers manifests on the medial side of leg ie; long saphenous varicosity and also occasionally on the lateral aspect ie; short saphenous varicosity. Ulcer generally were shallow and superficial, edge is sloping, Never penetrates the deep fascia, floor is covered by pale granulation. Usually painless, unless effected by secondary infections or penetrates deep causing peridotites tibia. The surrounding area of the ulcer is hyper pigmented (owing to stasis of blood), indurated and tender. When compared to men women are more often affected. Varicose ulcers always found secondary to may years of venous disease. Discomfort, pigmentation, eczema and tenderness of skin exist for years prior to ulceration.

In Ayurveda Varicose vein can be correlated to sira granthi³. Over a period it may leads to dushtavrana (chronic ulcer). According to Susruta Acharya, dusthavrana lakshanas: Atisamvruta – too Narrow mouthed, Ativivrita- too Wide mouthed, Ati Kathina- too Hard, Ati Mridu- too Soft, Utsanna- Elevated, Avasanna- Depressed, Vedonavan- Severe pain, Ushna- Hot, Daha- Burning sensation at the site, Paka – Suppuration, Raga- Redness, Puyasravya - Discharging pus, Dusta Shonitasravi- discharging vitiated blood, Manojnadarshana- With ugly sight, Kandu- Itching, Shopha- Swelling, Pidaka - With boils, Mrudu- Soft, Bhairava- Frightful, Putimamsasirasnayu- Full of pus, muscles, vessels, ligament⁴.

In all raktajavikara raktamokshana is a para-surgical procedure to expel out the vitiated blood. As per Ayurveda, raktamokshana is indicated in all diseases which are caused due to rakthadusti. So it is considered as a shodhana procedure in raktajavikara. Sushruta samhita explains all the procedures of raktamokshana in detail. It is an age old method practiced by the Mesopotamians, the Egyptians, the greek, the Mayans and the Aztecs.

Jalaukavacharana (leech therapy) is considered to be the best due to its high efficacy and its safety. Use of jalouka for raktamokshana is not only explained by the samhitas but references of the same are available in the koushika sutra of atharvaveda. Leech Therapy is considered most unique and effective method of raktamoksha. It is indicated in females, children, old and patients having poor threshold to pain. It drains impure blood useful in Pitta dushita Rakta diseases, various skin disorders and all types of inflammatory conditions⁵.

Leeches are carnivorous or blood sucking annelid worms. In India, about 45 species of leech belongs to 22 genera. The Indian leeches, *Hirudinaria granulosa* has got medicinal properties. It prefers shallow water and remains concealed under weeds, logs and stones. It is sanguivorous (blood-sucking), sucking the blood of fishes and frogs and also of cattle or human beings when they enter the pond.

Leeches are blood sucking worms with two characteristic suckers at both end of the bodies. To feed a leech, first attaches it to the host using the suckers. One of these suckers surrounds the leech's mouth, which contain three sets of jaws, consisting of about 80 calcareous teeth that bite, making a Y-shaped incision. Little openings between the teeth secrete saliva. The saliva releases chemicals that dilate blood vessels, decrease the blood viscosity and deaden the pain of the bite⁶.

Aetiology of varicose ulcers was increased intravenous pressure, secondary to deep vein thrombosis, chronic constipation and long standing occupation etc. These leads to long standing increase in intravenous pressure which damages the venous walls, results in stretching, loss of elasticity, hyper lipo-dermato-sclerosis and finally ulceration.

Signs and symptoms of venous leg ulcers are open, often painful, sores in the skin that take more than a month to heal. They usually develop on the inside of the leg, just above the ankle. Other features noticed are, swollen ankles (oedema), ankle flare, hardened skin around the ulcer, aching in your legs, varicose eczema, swollen and enlarged veins on your legs (varicose veins).

A venous leg ulcer can be susceptible to microbial infections. Symptoms of an infected leg ulcer were worsening pain, a green or unpleasant discharge coming from the ulcer, redness and swelling around the ulcer, fever. The treatment of varicose ulcers are elevation of foot, elastic compression, skin grafts and surgery. Acharya Sushruta has exclusively mentioned the treatment regime for 'Siragata Vata' which includes Snehana and swedana along with Raktamokshana. Sushruta has advocated 60 procedures (Shashthi upakramas) for vrana chikitsa based on the avastha of vrana. He has given the utmost importance to Bloodletting therapy and considered Leech as the most unique, effective method of bloodletting even in infected wounds and in abscess management. Sushruta has advocated that bloodletting by Leech can be practiced in all inflammatory, suppurative and painful conditions to relieve pain and inhibit suppuration including that of non healing ulcerative lesions. If varicose ulcer is not treated properly, infection leads to increased pain, swelling, redness and pus, loss of mobility and severe complications like osteomyelitis, septicaemia or malignancy etc.

Statistics the recurrence of venous ulcers is common, ranging from 54 to 78% after healing. Hence, in spite of all advances in health sciences, varicose ulcer management is still a difficult task for the surgeons. In Ayurvedic prospective, we can co relate varicose ulcers with 'Siragat Vatajanya vrana'. Sushruta acharya has described wound management in a most scientific way and given the utmost importance to Bloodletting therapy and considered Leech as the most unique and effective method of bloodletting even in infected wounds and abscesses. This condition is approached assessed and treated as a dusta vrana. The chikitsa of dusta vrana is mainly rakthamokshana along with apatarpana, snehana, swedana, vamana, virechana etc.

Assessment for bloodletting:

1. Aturabala, Rogabala and Ashaya (site of diseases) should be thoroughly assessed.
2. The bloodletting should be done once after 15 days with Snehana and Swedana.
3. kala should be well assessed. (Climatic conditions) It should be done in Sharada Kala. But in case of emergency Raktamokshana can be done at any time.
4. Matra (Quantity of expellation): According to Charaka, it depends upon the roga-rogibala, but it should be performed till the Rakta become "Shuddha" (purified).

According to Sushruta and Vagbhata it should be 1 Prastha = 64 tolas = 768g (1 tola = 12 g). UttamaMatra 1 Prastha = 768 g.

Madhyama Matra ½ Prashta = 384 g.

AdhamaMatra ¼ Prastha = 192 g.

JALOUKAAUCHARAN VIDHI:

POORVA KARMAS

Preparation of the Jalouka: The ideal Nirvisha Jalouka is selected, Jalouka is kept in the turmeric water for a few minutes. It is then transferred to fresh water & is observed for active movements

Preparation of the Patient: patient part is cleaned with normal water and wipe with cotton.

PRADHANA KARMA

The Jalouka is placed at the site of the wound and allowed to suck blood. If the leech is not sucking blood, a small drop of honey is put there or a small wound is made with a surgical blade. A wet piece of cotton is placed over the Jalouka to maintain the moist. Jalouka will leave after sucking the impure blood at that time the patient feels pain or itching, Jalouka is detached by sprinkling saindhava/turmeric powder at the mouth.

PASCHATH KARMA

Jalouka is made to vomit by pouring turmeric powder. Then washed in fresh water & stored in a clean vessel containing fresh water. The patient wound is cleaned and dressed.

COMPLICATIONS

In spite of all the precautions taken, there is a risk of certain adverse effects and subsequent complications such as pain during treatment, local itching, hypotension, vasovagal attacks, anaemia, infections, allergies, sepsis, transmissions of infectious diseases, scarring and slight fever.

DISCUSSION

Recurrence of venous ulcers is quite common according to statistical studies, ranging from 54 to 78%. It occurs mostly after 5th decades of life. Hence, in spite of all advances in medical science, varicose ulcer management is still a difficult task for the surgeons. In Ayurvedic prospective, varicose ulcers can be co-related with Siragat Vatajanya vrana. Acharya Susruta has described wound management in a most scientific way. He has given the utmost importance to bloodletting therapy, in which Leech therapy is considered as the most unique and effective method of bloodletting even in infected wounds and abscesses.

Varicose ulcer pathogenesis starts with dysfunction of venous valves, which causes venous hypertension and results in stretching of the veins. The blood proteins are leaked into the extra vascular space due weak veins. The extra cellular matrix molecule and growth factor were isolated and prevented from reaching wound site, thus delays the wound healing process. Similarly, leaking of fibrinogen and deficiency in fibrinolysin leads to fibrin build up around endothelium which prevents oxygen and nutrients from reaching cells. Thus the plugging of the vessels causes ischemia around the wound resulting in delaying in wound healing. Further, venous insufficiency leads to accumulation of leucocytes in micro vessels and releases inflammatory factors which cause formation of chronic ulcers. Ayurvedic treatments for siragata Vatajanya vrana according to Acharya Susruta were local oil massage and fomentation, raktamoksha with Leech. Susruta has advocated Shashthi upakramas for wound management which can be practiced as per stage of wound and necessity. Susruta has also specified that the wounds over the lower limb delays in healing. Leech therapy is considered as most unique and effective method of bloodletting. It is indicated in Females, Children, Old and Patients having poor threshold to pain. Impure blood was sucked by the leech, which used in Pitta and Rakta diseases like various skin disorders and all types of inflammatory conditions. In Susruta samhita Chikitsasthana, chapter 12 and 16, Susruta has advocated that bloodletting by jalouka can be done in all inflammatory, suppurative and painful conditions of increased pitta and Rakta condition to relieve pain and inhibit suppuration.

Leech application has peripheral vasodilator effects due to vasodilator a constituent in the leech saliva, which improves blood circulation and corrects ischemia around the wound, thus promotes wound healing. Leech application has Anti-inflammatory action on nerves due to presence of substance like Bdelins & Eglins in the saliva which prevents leukocyte accumulation in the surrounding vessels, thus inhibits release of inflammatory factors which causes chronic wound to heal. Receiving acetylsalicylic acid derivatives (aspirin) helps behind the probable mechanism of action of leech therapy. Leech application corrects venous hypertension, reduces vascular congestion due to presence of Carboxypeptidase A inhibitors, Histamine like substances & Acetylcholine, thus it venous valve dysfunction and extra vascular fluid perfusion⁶. This prevents leakage of proteins and isolation of extra cellular matrix molecule and growth factors, thus helps to heal the wound.

After Leech application expulsion of impure blood takes place, due to which local vitiated doshas (toxins & unwanted metabolites) are removed. Similarly, it facilitates more fresh blood supply & promotes

wound healing by formation of newer tissues. Due to improved blood circulation, skin discoloration is corrected and venous valvular dysfunction is also pacified. Thus, it breaks the pathogenesis of "varicosity" at cellular level and helps in wound healing.

However, from biochemical analysis, the saliva of leech contains about hundred pharmacologically active biological substances like Hirudin, hyaluronidase, vasodilators, anesthetics, antibacterial, fibrinases, collagenase etc. These substances are injected into human body while sucking blood and are responsible for the analgesic, anti inflammatory and anaesthetic effects of leech therapy. As proved by various research studies, the effect of leech therapy depends on the amount of blood that leeches ingested and the anticoagulant enzymes of the saliva that allow blood to flow from the bite after the leech is detached⁷. Leech saliva contain Hirudin, which is responsible for inhibiting blood coagulation and is employed as an anticoagulant in surgical operations and has been recommended for the prevention of phlebitis and postoperative pulmonary inflammation. Calin helps in the inhibition of blood coagulation and also responsible for slow cleansing of wound by maintaining secondary bleeding for approximately another 12 hours. Histamine-like substances have vasodilating effect and thereby cause the blood to stream to the bite site. In the mean time, the spreading factor, hayaluronidase acts to clear the path for the active and healing substances to penetrate. These substances allow continued bleeding for up to 24 hrs after the leech has been detached. Besides, a regional analgesic and antiphagositic effect by these substances enforced by hayaluronidase as well as counter irritation might be possible.

Medicinal leech (*Hirudo medicinalis*) saliva contains hirudin, which inhibits blood coagulation by binding to thrombin. Calin Inhibits blood coagulation by blocking the binding of von will brand factor to collagen, inhibits collagen mediated platelets aggregation. Interstitial viscosity is increased by Hirustatin Inhibits Kallikrein, trypsin, chymotrypsin, neutropholic cathepsin G Hyaluronidase. Proteolytic enzymes of host mast cells will be inhibited by Antibiotic Tryptase inhibitor. Factor Xa inhibitor Inhibits the activity of coagulation factor Xa by forming equimolar complexes. Complement inhibitors may possibly replace natural complement inhibitors if they are deficient Carboxypeptidase. A inhibitors increase the inflow of blood to the bite site. Histamine like subatances are vasodilator, which increase the inflow of blood at the bite site. Acetylcholine acts as vasodilators and anesthetic substances. Medicinal leech therapy in producing venous decongestion, reversal of oedema, hyper pigmentation and healing of varicose ulcers.

Nowadays leech therapy is used in thromboembolic diseases (coronary artery thrombosis and Ischemic heart diseases), thrombophlebitis, hypertension, varicose ulcer, skin and musculoskeletal diseases, plastic surgery, replantation and other reconstructive surgeries . Contemporary leech therapy was pioneered by the surgeons, M Derganc and F Zdravic, who developed leeches in tissue flap surgery in which a flap of skin is freed or rotated from an adjacent body part to cover a defect part. Their rationality of the leeches was based on a unique property of creation of a puncture wound that bleeds for hours.

Leech application expulsion of impure blood and facilitates fresh blood supply and promotes wound healing. Thus, it breaks the pathogenesis of varicosity at cellular level and helps in wound healing. Sira and Snayu are the updhātu of Rakta, jaluka acts as 'Raktaprasadnya'. Hence, healthy newer tissues were formed along with strengthening of the blood vessels, thus corrects venous valvular dysfunction.

CONCLUSION:

Varicose veins are dilated veins do to improper function of valve's. This leads to stasis, thickening of blood and finally ulceration. As stasis is the main reason, shodhana of raktha is the best treatment. “Grathitha jala janmabhihi” ie; jaluka is the best method to eliminate deep seated thick blood. So jalukavacharana is the right choice of sirajagranti janya vrana. Leech therapy proves to be effective, time saving, affordable and acceptable treatment in varicose ulcer. We can roughly conclude that Ayurveda can give a ray of hope in the treatment of varicose veins and varicose ulcer.

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