

Effect of *Rakthamokshana* (blood letting therapy) and Sri Lankan traditional medicine on *Siraja Granthi* (varicose veins) - A case study

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Abstract:

Siraja Granthi, a disease described in Ayurveda, can be correlated with varicose veins. Varicose veins occur due to accumulation of blood caused by damaged or weakened valves. *Rakthamokshana* (bloodletting therapy) using leeches, paste of fresh leaves of *Dahaspethiya* (*Tagetes erecta*) and *Maduruthala Koththamalli Wandu Thambuma* (*Ocimum sanctum* and *Coriandrum sativum*) are used by Sri Lankan traditional physicians to treat *Siraja Granthi* (varicose veins) with positive results. A 35year old female patient with a 14year history of varicose veins with dilated tortuous veins, heaviness and pain in the left leg was selected. Patient was treated for 21 days. Bloodletting therapy was conducted using leeches on days 1, 8 and 15. Oral administration of *Madurutala Kottamalli Wandu Thembuma* (MKWT), along with external application of *Daspethiya lepa* was carried out from Day 1 to 21. But *Daspethiya lepa* was not applied on Days 1, 8 and 15; days where bloodletting therapy was conducted. Therapeutic effects were evaluated through symptomatic relief. By Day 15, elevation of veins was completely relieved and heaviness, pain in leg and pain in leg while walking were partially relieved. By Day 21, symptoms such as heaviness, pain in the leg and pain in leg while walking were completely relieved. According to Ayurveda *Siraja Granthi* is caused by vitiation of *Vata* and *Pitta Dosha*. *Rakthamokshana* is the best treatment method to eliminate vitiated *Pitta Dosha*. Leeches' saliva contains hirudin and calin which help to inhibit blood coagulation and acetylcholine, which helps to dilate blood vessels. Ingredients of MKWT pacify vitiated *Vata* and *Pitta Dosha*. Antioxidant and wound healing properties of ingredients of MKWT are scientifically proven. Antioxidant, wound healing, analgesic, antibacterial properties of *Tagetes erecta* are also scientifically proven. Due to these properties, this treatment regimen is effective in treatment of *Siraja Granthi* (varicose veins).

Key words: *Daspethitya*, *Madurutala Kottamalli*, *Siraja Granthi*, *Tagetes erecta*, Varicose veins, *Wandu Thambuma*

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Introduction:

Siraja Granthi, a disease mentioned in Ayurveda, occur by vitiation of *Vata Dosha* and *Raktha Dhatu*.^[1] It can be correlated with varicose veins. *Chikitsa Sutra* of *Siraja Granthi* was not found in authentic texts. In *Susrutha Samhitha Vataja* and *Pittaja Granthi Chikitsa Sutra* are described. *Vataja Granthi Chikitsa Sutra* can be applied in treatment of *Siraja Granthi* when *Doshic* involvement is considered. *Pittaja Granthi Chikitsa Sutra* can be applied in treatment of *Siraja Granthi* when involvement of *Raktha Dhatu* is considered. *Raktamokshana* (bloodletting therapy) is one of the therapeutic measures described in treatment of *Pittaja Granthi*.^[2] Therefore, it was decided to conduct bloodletting therapy using leeches. Paste of *Dahaspethiya* (*Tagetes erecta*) and *Maduruthala Koththamalli Wandu Thambuma* (*Ocimum sanctum* and *Coriandrum sativum*) are used

in treatment of *Siraja Granthi* by Sri Lankan traditional physicians (Fig-1). Aim of the study is to scientifically evaluate the effects of these treatments.

Case Report:

A 35year old female patient with a 14year history of varicose veins (*Siraja Granthi*) was selected from Ayurveda teaching hospital, Borella, Sri Lanka. She had dilated tortuous veins, heaviness and pain in the left leg. Selected patient was examined thoroughly and Brodie trendelenburg test, Perther's test and three Tourniquets test were carried out.^[3] Severities of the symptoms were recorded using the specially prepared grading scale given below (Table-1). The selected patient was treated for a period of 21 days as per treatment protocol mentioned in table -2.

Table 1: Grading scale of symptoms:

Symptoms	Grading Scale
Pain in leg (<i>Sarujam</i>)	Normal = 0 = No Pain in leg
	Mild = 1 = Occasional pain in leg
	Moderate = 2 = Intermittent pain in leg
	Severe = 3 = Frequent pain in leg
	Very severe = 4 = Continuous pain in leg
Pain in leg while walking (<i>Sarujam</i>)	Normal = 0 = No Pain in walking
	Mild = 1 = Mild pain while walking
	Moderate = 2 = Moderate pain while walking
	Severe = 3 = Severe pain while walking
	Very severe = 4 = Cannot walk due to pain
Palpability of the varicose veins (<i>Chalam</i>)	Normal = 0 = Not movable
	Mild = 1 = Movable by heavy force
	Moderate = 2 = Movable by little force
	Severe = 3 = Movable without force
	Very severe = 4 = Slagging of the varicose veins

Elevation of the veins (<i>Unnatham</i>)	Normal = 0 = No elevation
	Mild = 1 = Elevation from the skin less than 1mm
	Moderate = 2 = Elevation from the skin more than 1mm to 3mm
	Severe = 3 = Elevation from the skin more than 3mm to 5mm
	Very severe = 4 = Elevation from the skin more than 5mm
Heaviness in the legs (<i>Gaurava</i>)	Normal = 0 = No heaviness
	Mild = 1 = Mild heaviness when at rest
	Moderate = 2 = Moderate heaviness when at rest
	Severe = 3 = Severe heaviness when at rest
	Very severe = 4 = Cannot sleep due to heaviness

Table-2: Treatment Schedule:

Treatment	Day	Treatment schedule
Bloodletting therapy (<i>Rakthamokshana</i>)	Day 1	Blood letting therapy (<i>Rakthamokshana</i>) was carried out using leeches in the morning; 8.00a.m to 9.00a.m.
	Day 8	
	Day 15	
<i>Maduruthala Koththamalli Wandu Thembuma</i> (MKWT)	Day 1 -21	60ml of <i>Maduruthala Koththamalli Wandu Thembuma</i> was administered orally twice a day after meals
Dahaspethiya lepa	Day 1 - 21 (except on Day 1, 8 and 15)	200gm of <i>Dahaspethiya lepa</i> (<i>Tagetes erecta</i>) was applied externally. It was left to dry (about 30 minutes) and then washed off with lukewarm water

*Tagetes erecta**Ocimum sanctum**Coriandrum sativum* seeds**Fig-1: Ingredients used in paste**

Procedure of bloodletting therapy (Rakthamokshana)**Purification of leeches:**

The leeches were purified before applying by putting them into medicated water, prepared by adding 2gm of powder of dried rhizome of *Curcuma domestica* (Family: Zingiberaceae) to 100ml of water.

Preparation of patient:

Patient was advised to take light diet and to void bowels and bladder. The area to be treated was thoroughly cleaned with warm water, without applying soap or cleansers.

Application of Leeches:

Leeches were applied on the affected area, avoiding major veins and arteries. Leeches were covered with wet pieces of cotton wool, keeping them cool and moist to facilitate sucking blood. Leeches were allowed to suck blood till they fell off. Powder of *Glycerrhizaglabra* was applied over leech bites and wounds were bandaged. Then patient was made to rest. Sucked blood was removed from the leeches by sprinkling turmeric powder over their mouths, thereby making it vomit. Then, leeches were put in a vessel with pure water.

Method of preparation of *Dahaspethiya lepa*:

200g of fresh leaves of *Tagetes erecta* were ground with 50ml of water.

Method of preparation of *Maduruthala Koththamalli Wandu Thambuma* (MKWT):

The 60g each of fresh roots of *Ocimum sanctum* (*Madurutala*) and dried seeds of *Coriandrum sativum* (*Koththamalli*) were taken and crushed. Boluses were prepared with this mixture using a piece of cotton cloth and steamed on low fire. Steaming stopped when exuding aroma. Then the mixture was put into a bowl and 320ml of hot water was added, kept for 15 minutes, squeezed and strained using a cotton cloth. The final volume of extracted juice was 120 ml. This is called *Maduruthala Koththamalli Wandu Thambuma* (MKWT).

Results:

None of the symptoms reduced with these treatments by Day1 and 8. But, palpability of the varicose vein (*Charam*) and elevation (*Unna ham*) were completely relieved and heaviness and pain in leg, pain inleg while walking were partially relieved on Day 15. Rest of the symptoms such as pain and heaviness in the leg and, pain in walking were completely relieved on Day 21 as tabulated in table-3. Brodie-Trendelenburg test and Perther's test were negative before and after treatments. Three Tourniquets test was positive before treatment and negative after completion of treatments.

Table-3: Severity of clinical symptoms before and after treatment

Sign and Symptoms	Before treatment	After treatment							
		Day 01		Day 08		Day 15		Day 21	
	Grade	Grade	Percentage of relief	Grade	Percentage of relief	Grade	Percentage of relief	Grade	Percentage of relief
Pain in leg (<i>Sarujam</i>)	2	2	0%	2	0%	1	50%	0	100%
Pain in walking (<i>Sarujam</i>)	2	2	0%	2	0%	1	50%	0	100%
Palpability of the vein (<i>Charam</i>)	1	1	0%	1	0%	0	100%	0	100%
Elevation from the skin (<i>Unna ham</i>)	1	1	0%	1	0%	0	100%	0	100%
Heaviness in the legs (<i>Gaurava</i>)	2	2	0%	2	0%	1	50%	0	100%

Discussion:

Effect of *Maduruthala Koththamalli Wandu Thambuma (MKWT)* in *Shiraja Granthi*:

According to Ayurveda, *Vata Dosha* and *Raktha Dhathu* are vitiated in *Shiraja Granthi*. *Raktha Dhathu* is associated with *Pitta Dosha*. Ingredients of *Maduruthala Koththamalli Wandu Thambuma* possess *Madhura Rasa*, *Snigdha Guna*, *Ushna*

Veerya and *Madura Vipaka* which help to pacify vitiated *Vata Dosha*. It pacifies vitiated *Pitta Dosha* as these ingredients possess *Madhura*, *Tiktha*, *Kashaya Rasa*, *Ruksha Guna* and *Madhura Vipaka*. Because of these properties, MKWT is beneficial in treatment of *Siraja Granthi*.

Thrombolytic activity, antioxidant and wound healing properties of *Coriandrum sativum* are scientifically proven.^[4-6] Moderate clot lysis activity, antioxidant and wound healing properties of *Ocimum sanctum* are scientifically proven.^[7-8] Due to these properties MKWT is beneficial in treatment of varicose veins through lysing clots in blood vessels, improving blood flow, and preventing damage to tissues.

Effect of *Dahaspethiya lepa* in *Siraja Granthi*:

Ayurveda pharmacodynamic properties such as *Rasa*, *Guna*, *Veerya*, and *Vipaka* of *Dahaspethiya* (*Tagetes erecta*) were not found in classical texts. Anti-oxidant, wound healing and analgesic properties of *Tagetes erecta* are scientifically proven.^[9-10] Due to these properties, it helps to reduce pain and to regenerate damaged tissues.

Effect of *Rakthamokshana* in *Siraja Granthi*:

Ayurveda describes *Rakthamokshana* (bloodletting therapy) as one of the therapeutic measures in treatment of *Pittaja Granthi*. *Rakthamokshana* helps to eliminate vitiated *Dosha*, especially *Pitta Dosha*.

Siraja Granthi occurs by vitiation of *Raktha Dhatu* which is mainly associated with *Pitta Dosha*. Therefore *Rakthamokshana* was beneficial in treatment of *Siraja Granthi*.

Table 4 shows the major constituents of leech saliva.^[11-12] Leech saliva contains anticoagulant hirudin, which stops blood clotting and dissolves thrombi, clearing partial and complete blockages in distal arteries. It also contains anticoagulating and antiplatelet agents and dilates the vessels, thereby allowing blood to flow freely through the vessels. By ingesting excess blood, leeches reduce tissue swelling and promote healing. These microcirculatory actions enable fresh oxygenated blood to reach hosts' affected areas, leading to restoration of the normal circulation.

Leech application in varicose veins (*Siraja Granthi*) has integrated the positive effect due to a thrombolytic and anti-inflammatory effect of leeches' saliva. There are some substances which improve vascular permeability and due to action of these substances swelling and pain is decreased or disappeared.

Table 4: Contents of saliva of leeches:

Constituents	Function
Hirudin	Inhibits blood coagulation by binding to thrombin
Calin	Inhibits blood coagulation by blocking the binding of von Will ebrand factor to collagen; Inhibits collagen-mediated platelet aggregation
Destabilase	Monomerizing activity; Dissolves fibrin
Hirustasin	Inhibits kallikrein, trypsin, chymotrypsin, and neutrophilic cathepsin G
Bdellins	Anti-inflammatory; Inhibits trypsin, plasmin, acrosin

Hyaluronidase	Increases interstitial viscosity and Antibiotic action
Leech-derived Tryptase inhibitor (LDTI)	Inhibits proteolytic enzymes of host mast cells
Eglins	Anti-inflammatory; Inhibit the activity of alpha-chymotrypsin, chymase, substilisin, elastase, cathepsin G
Factor Xa inhibitor	Inhibit the activity of coagulation factor Xa by forming equimolar complexes
Carboxypeptidase A Inhibitors	Increases the inflow of blood at the bite site of inhibitors
Acetylcholine	Vasodilator
Histamine like substances	Vasodilator

Conclusion:

Rakthamokshana (bloodletting therapy) using leeches along with internal administration of *Maduruthala Koththamalli*

Wandu Thambuma and external application of *Daspethiya lepa* is effective in treatment of *Siraja Granthi* (varicose veins) without oedema and ulcers.

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