

# Management of nonhealing venous ulcer in systemic sclerosis with leech therapy—A case report

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### ABSTRACT

Systemic sclerosis (SSc) is a rare disease characterized by autoimmune pathogenesis, alterations to the vascular system, and fibrosis of the skin and internal organs. Nonhealing venous ulcers are quite common in SSc patients. A 32 years old female was brought with a foul-smelling ulcer with purulent discharge which was not healed despite using the allopathic treatment for 2 months. Even with treatment, it got worsened so the fear of amputation of leg enforced her to take Ayurvedic consultation. After 1 month of treatment with leech therapy along with Ayurvedic medicines and 3 months of follow-up, the wound got healed. It is concluded that leech therapy with Ayurvedic medicines is highly effective for the management of nonhealing venous ulcers.

**Keywords:** Leech therapy, nonhealing venous ulcer, systemic sclerosis

### Introduction

Systemic sclerosis (SSc) is a rare and progressive multisystem autoimmune disorder that is characterized pathologically by vascular abnormalities, sclerosis of skin, and internal organs with autoantibodies.<sup>[1]</sup> Skin ulcers occur in 35–60% of SSc patients. The etiology of these ulcers is not well known, but these may reflect chronic vasculopathy. The treatment of chronic ulcers of the lower extremities presents a therapeutic challenge in modern medicine. In the text of Ayurveda, *Rakta Dusti* (Impurity of blood) is considered as one of the prime causes of skin diseases<sup>[2]</sup> and patients may get relief after letting out the vitiated *Rakta*. In the present case, the patient was managed with leech therapy along with Ayurvedic medications in a very economical way.

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### Case History

A 34 years old female approached OPD with a foul-smelling, nonhealing, necrotizing ulcer over the dorsal aspect of the left lower leg above the heel for 1 month. She was a known case of diffuse cutaneous systemic sclerosis for 11 years. Her leg ulcer was not healing despite using conservative treatment (linezolid, 600 mg) for the last 1 month by a dermatologist. But the wound showed no signs of improvement despite the condition worsened. Due to insignificant relief and worsening conditions of ulcer and fear of amputation of the leg, the patient came for alternative therapy in the All India Institute of Ayurveda. On local examination, the wound was of 14\*6 cm in size, full-thickness skin loss with destruction of muscle and bone exposed, edges well-defined, undermined, and not attached to the base, completely covered with loosely adherent yellow slough with thick purulent discharge, surrounding skin was hyperpigmented and indurated with the rise in local temperature. Considering the history, clinical examination, and investigations, the treatment [Table 1] was given and needful interventions [Table 2] were done.

According to Bates-Jensen wound assessment [Table 3], after complete treatment and follow-up improvement in size

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was 100% and undermining, necrotic tissue, exudate type, exudate amount, skin color surrounding the wound, peripheral tissue edema, peripheral tissue induration, granulation tissue, epithelization was 80% (result can be seen in Figure 1).

## Discussion

There are many diseases that offer a challenge to the medical world, practitioners and also the scientific community to understand their pathophysiology and proper management. Autoimmune disorders are among such challenging diseases. Immunity plays a very determinant role in deciding the prognosis of disease as well as the outcome of management. It may be the interest of research to explore the beneficial effect of hypersensitivity response in modulating the latent immune

response in the patient of autoimmune disorders. In this article, a case is discussed which is a known case of systemic sclerosis. In this case use of *Jalouka* (leech) is based on the concept of provoking the immune response to stimulate the stem cells of skin for regeneration supplemented with Ayurvedic medicines. Leech therapy is a painless, minimal invasive technique of controlled bloodletting (*Raktamokshana*).<sup>[3]</sup> In recent studies, more than 20 bioactive molecules having anti-inflammatory, analgesic, antimicrobial, and anticoagulant properties were reported from medicinal leeches.<sup>[4]</sup> Based on clinical presentation the patient was diagnosed as a case of *Kshudra Kushtha*<sup>[5]</sup> and the treatment was planned accordingly. As per the *dosha-dushya* involvement and the physical condition of the patient (cachexic), it was decided to use *Brimhana chikitsa* (nutritional palliative treatment for restoring the natural

**Table 1: Treatment given to the patient**

Date	Drugs, dosage and anupana
20-7-19 (for 10 days)	(A) N3 churna (NGA) each 2 gm twice a day, with luke warm water (B) <i>Gandhak rasayan</i> 2 tablet twice a day with normal water (C) Combination of <i>Rasamanikya</i> 60 mg, <i>Pravalpishti</i> 125 mg and <i>Trivangbhasma</i> 125 mg twice a day with honey
30-7-19 (for 7 days)	<i>Panchtikkatghritaguggulu</i> 2 table spoon and <i>Trikatu churna</i> 2 gm twice a day empty stomach with luke warm water N4 churna (NDHI) 2 gm each twice a day in decoction form <i>Khadirarishat</i> 2 table spoon, twice a day with equal amount of water
6-8-19 (for 15 days)	(A) Combination of <i>Panchtikkatghrita guggulu</i> 2 table spoon, <i>Trikatu churna</i> 2 gm and <i>Shudhgandhak</i> 125 mg twice a day, empty stomach with luke warm water (B) <i>Yastimadhu churna</i> and <i>Kutaki churna</i> each 2 gm, twice a day with luke warm water
22-8-19 (for 15 days)	(A) <i>Krimimudag rasa</i> 125 mg and <i>Vidang churna</i> 3 gm twice a day with normal water (B) <i>Amla swaras</i> and <i>Giloya swaras</i> each 10 ml twice a day with normal water (C) <i>Erand taila</i> 5ml bed time
Follow up treatment given) 9-9-19 (15 days)	(A) <i>Khadirarishata</i> 3 table spoontwice a day with equal amount of water (B) <i>Vidangadilauha</i> 2 table twice a day with normal water (C) <i>Kumarkalyanrasa</i> 1 tablettwice a day for 20 days with normal water (D) <i>Panchnimbadi churna</i> 3gm and <i>Shudhgandhaka</i> 125mg twice a day with normal water
18-10-19	Combination of <i>Amla churna</i> 3gm <i>Shirisha chaala</i> churna 10 gm <i>Trikatu churna</i> 3 gm and <i>Go ghrita</i> 1 table spoon 20 ml kwathtwice a day decoction form
8-11-19	<i>Sudarshan churna</i> and <i>Kalmegh churna</i> each 3 gm twice a day with luke warm water (B) Combination of <i>Phalasarp</i> 2 table spoon, <i>Trikatu churna</i> 2gm and <i>Dhatrilauha</i> 125 mg, twice a day with normal water (C) <i>Shirish chaalkwath</i> 20 ml twice a day in decoction form (D) <i>Chyvanprsha avleha</i> 2 table spoon twice a day with milk

\*N=Nimba churna, G=Giloychurna, A=Amla churna, D=Daruhaldichurna, H=Haridra churna, T=Triphala churna

**Table 2: Timeline of events (condition of the patient and her wound with time)**

Date	Findings	Intervention	Outcome
20-7-19 to 24-7-19	Patient visited, diagnosed as Kshudra Kushtha and admitted	Ayurveda external treatment started [Table 1] Oral antibiotic linezolid 600 mg continued	No improvement in wound
24-7-19 to 30-7-19	Pyrexia 102°F and Total Leucocyte Count 13600/cumm	(a) Previous ayurvedic medicines stopped and new medicines started [Table 1] (b) Leech therapy started (1 <sup>st</sup> sitting on 24/07/19) followed by dressing with <i>Haridra churna</i>	Amount of discharge decreased
30-7-19 to 6-8-19	Total Leucocyte Count 19460/cumm wound swab culture sent and found patient was resistant to Linezolid antibiotic	Previous medication was revised [as Table 1] 2 <sup>nd</sup> sitting of leech therapy (on 30/07/19) Linezolid antibiotic stopped	Discharge almost nil, no slough
6-8-19 to 13-8-19	Pyrexia 103°F	<i>Yastimadhu churna</i> + <i>Kutaki churna</i> added to control raised TLC 3 <sup>rd</sup> sitting of leech therapy (on 06/08/19)	No discharge from wound No episode of pyrexia onward
13-8-19 to 19-8-19	Wound looks healthy	4 <sup>th</sup> sitting of Leech therapy (on 13/08/19) Previous medication repeated [Table 1]	TLC dropped down to 1237/cumm
19-08-19	Satisfactory wound healing	5 <sup>th</sup> sitting of leech therapy (on 20/08/19) Previous medication repeated [Table 1]	Ulcer with healthy granulation tissue
22-8-19	Wound margins healthy and oofled with healthy granulation tissue	(a) New medicines prescribed [Table 1]	Patient discharged with healthy healing wound. Wound size and depth decreased Skin color Surrounding wound became red

**Table 3: Findings of Bates-Jensen wound assessment tool for this wound**

Item	22/7/19	8/8/19	22/8/19	9/9/19	8/11/19	22/11/19	Percentage decline
1. Size 1=Length x width 80 sq cm 2=Length x width 4--80 sq cm 3=Length x width 16.1--80 sq cm 4=Length x width 36.1--80 sq cm 5=Length x width >80 sq cm	5	4	3	3	2	0	100%
2. Depth 1=Non-blanchable erythema on intact skin 2=Partial-thickness skin loss involving epidermis and/or dermis 3=Full-thickness skin loss involving damage or necrosis of subcutaneous tissue; may extend down to but not through underlying fascia; and/or mixed partial and full-thickness and/or tissue layers obscured by granulation tissue 4=Obscured by necrosis 5=Full-thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone or supporting structures	5	4	3	3	2	2	60%
3. Edges 1=Indistinct, diffuse, none clearly visible 2=Distinct, outline clearly visible, attached, even with wound base 3=Well-defined, not attached to wound base 4=Well-defined, not attached to base, rolled under, thickened 5=Well-defined, fibrotic, scarred or hyperkeratotic	4	3	2	2	2	2	60%
4. Under- mining 1=None present 2=Undermining <2 cm in any area 3=Undermining 2-4 cm involving <50% wound margins 4=Undermining 2-4 cm involving >50% wound margins 5=Undermining >4 cm or tunneling in any area	3	2	1	1	1	1	80%
5. Necrotic tissue type 1=None visible 2=White/grey nonviable tissue and/or non-adherent yellow slough 3=Loosely adherent yellow slough 4=Adherent, soft, black eschar 5=Firmly adherent, hard, black eschar	3	2	2	1	1	1	80%
6. Necrotic tissue amount 1=None visible 2 = <25% of wound bed covered 3=25% to 50% of wound covered 4 = >50% and <75% of wound covered 5=75% to 100% of wound covered	5	4	3	1	1	1	80%
7. Exudate type 1=None 2=Bloody 3=Serosanguineous: thin, watery, pale red/pink 4=Serous: thin, watery, clear 5=Purulent: thin or thick, opaque, tan/yellow, with or without odor	5	3	3	1	1	1	80%
8. Exudate amount 1=None, dry wound 2=Scant, wound moist but no observable exudate 3=Small 4=Moderate 5=Large	5	3	2	2	1	1	80%
9. Skin-colored wound surrounding 1=Pink or normal for ethnic group 2=Bright red &/or blanches to touch 3=White or grey pallor or hypopigmented 4=Dark red or purple &/or non-blanchable 5=Black or hyperpigmented	5	3	2	2	1	1	80%

*Contd...*

Table 3: Contd...

Item		22/7/19	8/8/19	22/8/19	9/9/19	8/11/19	22/11/19	Percentage decline
10. Peripheral tissue edema	1=No swelling or edema 2=Non-pitting edema extends 4 cm around wound 3=Non-pitting edema extends <4 cm around wound 4=Pitting edema extends <4 cm around wound 5=Crepitus and/or pitting edema extends >4 cm around wound	5	2	1	1	1	1	80%
11. Peripheral tissue induration	1=None present 2=Induration, < 2 cm around wound 3=Induration 2-4 cm extending <50% around wound 4=Induration 2-4 cm extending >50% around wound 5=Induration >4 cm in any area around wound	4	3	1	1	1	1	80%
12. Granulation tissue	1=Skin intact or partial thickness wound 2=Bright, beefy red; 75-100% of wound filled and/or tissue overgrowth 3=Bright, beefy red; < 75% and >25% of wound filled 4=Pink and/or dull, dusky red and/or fills <25% of wound 5=No granulation tissue present	5	3	3	2	2	1	80%
13. Epithelialization	1=100% wound covered, surface intact 2=75% to 0.5 cm into wound bed 3=50% to <50% wound covered 4=25% to <50% wound covered 5 = < 25% wound covered	5	4	4	4	2	1	80%
TOTAL SCORE=60		59	40	30	24	18	15	75%



**Figure 1:** Images of wound showing its condition during treatment and follow up. (a) Wound on the first day before treatment. (b) Wound during the first sitting of leech therapy. (c) The second sitting of leech therapy. (d) Third sitting at the time of *Haridra* dressing. (e) The wound on the day of discharge from hospital (1 month from the first day). (f) Wound during follow-up after 1 and a half months. (g) Wound during follow-up after 3 and a half months. (h) Significant hair growth over the surrounding skin

strength), *Raktaprasadaka* (blood purifier) and *vrana sodhaka chikitsa* (ulcerated wound treatment). Details of the medicines given for the management of the patient at different stages are well described in Tables 1 and 2. Few observations are worth to be discussed such as the use of *Trivangabhasma* (herbomineral preparation) in exudative/oozing ulcerative wounds has a very significant role in reducing the discharge. It was observed that the secretions from the wound were all together stopping after the use of *Trivangabhasma* for 1 week. Similarly, the use of *Madhyasti*<sup>[6]</sup> and *Kutaki churna* for the management of raised total leukocyte count showed highly significant improvement. Medicated *gbrita* was used for easy assimilation of medicines and also for restoration of natural strength to add substantial relief in symptoms. The use of medicated *gbrita* was a part of immunotherapy and its role in immunity was assessed on improvement in *Oja* and *Dehabala*. (based on *Oja* and *Dehabala* assessment proforma) Acharya *Sushruta* (Father of surgery and great ancient Indian physician) said that there is the presence of *Krimi* (microbes/pathogens) in all types of *Kushtha* and, therefore, *Kriminashaka chikitsa* (deworming treatment) was given after the suppression of discharge from the wound. Thus, at the first step, the treatment was aimed to restore the general health of the patient (nutritive and immunotherapy) and reduce the secretion from the ulcerated wound. The next step starts with the cessation of exudates from the wound with the aim to wipe out the secondary/superimposed infection and the third step concentrate on the healing of wound with proper granulation tissues with the help of *Rasayana* therapy. Use of *Amala churna*<sup>[7]</sup> and *Shirisha chaal* (*Albizia lebecke* bark powder) is for reducing oxidative stress to facilitate skin regeneration. *Shirisha* is said to be the best antitoxin medicine in Ayurveda and researches also establish that it has potent anti-allergic, anti-inflammatory, immunomodulator, and anti-oxidant properties. *Kalamegha* and *Sudarshan churna*<sup>[8]</sup> were used to potentiate liver functions which were assumed to be impaired due to chronic use of medicines (contemporary as well as alternative). Both medicines have proven action on liver functions and are well-documented in research studies.<sup>[9]</sup> Improvements in terms of symptoms as well as laboratory parameters were good enough to draw the attention of the scientific community and also for Ayurvedic practitioners to reciprocate the findings. Use of *Jalouka* (leech) is very beneficial in primary care of ulcerative wounds as it is easily available and it can be easily applied over the wound so it uproots the disease in the primary stage. Care should be taken that the patient should not have any bleeding disorder and leeches must be medicinal.

## Conclusion

The presented combination of leech therapy and Ayurvedic medications is found to be a good alternative therapy in the management of nonhealing venous ulcers. Long-term prospective studies are required to substantiate the data.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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## Conflicts of interest

There are no conflicts of interest.

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