

Pain management and wound bed preparation of a chronic non healing wound over heel by Leech Therapy-A Case Study"

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ABSTRACT:

A Chronic wound is that which does not heal in an orderly set of stages and in a predictable amount of time. Chronic wound patients often report persistent pain as the dominant feature in their lives. In Ayurveda, it can be correlated to Dushtavrana which has foul smell, putrefied pus along with blood and cavity, present since long time and has bad odor.

According to T.I.M.E. principle of wound management, Leech therapy stands as biotherapy for wound debridement. Vis a vis leech therapy has anti-coagulant, anti-phlogistic, antibacterial and anesthetic properties which relieve local inflammation, enhances microcirculation there by providing nutrition to the affected tissue. Thus it facilitates formation of healthy granulation tissue and wound bed preparation. Keeping in mind, these fundamentals of Leech therapy and chronic non healing wound, a case study is presented in which a female of 65 years of age with chronic no healing wound on right heel, presented to our

OPD. Prima facie it resembled a malignant ulcer due to severe pain and soft tissue deformity on the heel. But on HPE, it was found to be benign. According to T.I.M.E principle, this patient was subjected to debridement under LA, daily dry dressing and leech therapy for 15 days. On day 5 only, patient got 70% pain relief which was analyzed by VAS scale and wound bed preparation assessed by various subjective criteria. When the wound bed was prepared, skin grafting was done on right heel.

15 days of post-operative stay in IPD and repeated 3 days follow up for 2 weeks, it was found that the graft was accepted. Hence it can be stated that Leech therapy plays a commendable role in pain management and wound bed preparation in chronic non healing wound.

Keyword: Chronic non healing wound, Pain, T.I.M.E., Leech therapy, Wound bed, Skin grafting.

INTRODUCTION: According to modern medical science wound is break in the integrity of the skin or tissues,

often which may be associated with disruption of the structure and function. Chronic wounds are those which do not follow the normal healing process and show no signs of healing in 4 weeks and remain in prolonged inflammatory stage¹. Chronic non healing wound which can be correlated to Dushta Vrana in Ayurveda texts is a debilitating illness especially in adult population irrespective of cause. In modern science whichever treatment is available is costly and affordability of these treatment options is questionable in developing countries like India. It is estimated that 1 to 2% of the population will experience a chronic wound during their life time in developed countries².

Acharya Sushruta who is known as father of Surgery, in Sadhyovraniya Adhyaya (Chikitsasthana) has elaborately explained details of types of Vrana³. Vrana which has foul smell, has putrefied pus along with blood, with cavity, present since long time and has bad odor is Dushta Vrana⁴. Acharya Sushruta also mentioned Shodhana by Raktamokshana (Bloodletting) in acute inflammatory conditions, indurated, cyanosed, painful swellings and many inflammatory conditions like Vranashopha, Vidhradhi, Granthi, Arbuda etc. and advised Jalaukavacharana (Leechtherapy) in Dushta vrana⁵(chronic non healing wound). Jalaukavacharana has a comprehensive therapeutic influence in reducing inflammation, pain, Srava(exudates) and vitiated Doshas. Jalaukavacharana stimulates granulation tissue in the wound bed which has good healing properties or vranashodhana properties⁶.

As Jalaukavacharana (leech therapy) stimulates granulation tissue formation by increasing pure blood flow, it can be used as a primary approach for management of Dushta Vrana (chronic non healing wounds). Leech therapy has fewer complications, painless procedure, cost effective, less time consuming, easy to apply so it is more convenient method for treating non healing wounds.

Wound bed preparation is the management of a wound in order to accelerate endogenous healing or to facilitate the effectiveness of other therapeutic measures. The overall goal of wound bed preparation is to create an optimal wound healing by producing a well-vascularized, stable wound bed with little or no exudates⁷.

CASE STUDY REPORT:

A 65 years Hindu female patient visited Shalyatantra OPD (Pakwasa Samanwaya Rugnalaya, Nagpur) on 23rd July 2018 with complaints of wound over right heel with unpleasant smell, Pain, burning and pricking in character and swelling around wound since 2 months. History revealed formation of small boil on right heel over planter aspect which burst within 2 days. She took treatment for the same in a private hospital (details not available), followed by dressing for 15 days in GMC, Nagpur. But wound got infected and was not healing in spite of treatment for around 2 months. With above complaints she came to our OPD in search of proper management of her condition. Prima facie it resembled a malignant ulcer due to severe pain and soft tissue deformity on the heel. But on HPE it was found to be benign. Patient doesn't have history of medical illness

like HTN, DM, KOCHS, and doesn't have any addiction, but has urinary incontinence since 4 years (? cause).

General Examination-P -74/min,BP-130/90 mmHg, RS- AEBE ,CVS- S1-S2 Normal ,CNS- Conscious and well oriented, P/A- Soft, NT

Local Examination: Inspection Site – planter aspect of Rt. Heel



Patient presentation on day 1

Size- Length- 3 inch,Width - 2.5 inch, Depth-12mm,Shape - Irregular , Edge - Rough, Irregular with fibrosed tissue, Floor - Unhealthy granulation tissue and slough ,Color- Black brown to light pinkish

Discharge- Slight serous discharge,Smell- Tolerable, unpleasant, surrounding area- Inflamed.

Vrana- Dushta

Palpation: - Tenderness Edge and Margin ++,Base - ++

Local Temperature – Raised

Lymph nodes – Not palpable

Investigations:

X-ray rt. calcaneum-(lat)-Sclerosis in Talus bone?

HPE: Infected granulation tissue

BSL – F-90 mg%, PP- 140 mg%

HPE (after debridement) - Hyperplastic squamous epithelium with nonspecific inflammation.

Differential diagnosis- Tropical ulcer, Malignant ulcer, Diabetic ulcer, Venous ulcer, Tubercular ulcer

Diagnosis- Chronic non healing ulcer

Materials and methods-

Materials- There are many species of leeches in medicinal use. In Asia *H. Manillensis* is used for treatment and in Europe *H. Medicinalis* is used for treatment. Along with this other species like *H. Verbana*, *H. Orientalis* are also used for treatment purpose.

- 1) Jalauka (Leech and Leech lab).
- 2) Haridra powder, Mustard powder.
- 3) Sterilized Gauze pieces, dressing pad, cotton, gloves.
- 4) Disposable syringe, kidney tray, distilled water, needle.
- 5) Container of sterile water, for placing leeches after they have been fed.

(This container was labeled with patient's name)⁸

Methods-

Leech therapy stands as biological therapy for wound debridement and was planned as a first line of treatment for 5 days to decrease pain and inflammation around wound along with vranadhawana with trifala kwatha, and dressings daily. After that patient was posted for surgical wound debridement under local

anesthesia, in which ulcer was debrided including edges and unhealthy granulation at floor and fibrosed edges around along with antibiotic coverage and ayurvedic medications like trifala guggulu 500mg twice daily for 5 days. Afterwards 2 jalaukas (leeches) daily were applied for 10 days over and periphery of wound for wound bed preparation.



Surgical debridement followed by Leech therapy-

a) Purva karma-2 Jalaukas of moderate size will be first prepared for Raktamokshana by keeping it in HaridraJala. Ulcerated site cleaned by Triphala kwatha dhavan. After that wound was cleaned by dry gauze.

b) Pradhana karma- After wearing the latex gloves prepared active two leeches

were kept over the wound and its periphery. When leech started to suck blood by itself, then wet cotton pad were placed over it. The time gap between Vranadhawana and raktamokshana was 2 to 3 hrs with wound washed with tapwater prior to leech therapy.

C) Paschatkarma- Haridra Churna was sprinkled over the leech's anterior sucker (mouth) for inducing vomiting. After expelling all the blood from its gut, the leech became active again and was stored in fresh water container. Haridra Churna was applied over the bite lesions and pressure dressing done.

Multifold actions of Leech Therapy⁹-

- In wound healthy cell gets sick when it is deprived of needed oxygen and nutrition, and is unable to remove toxins accumulated during metabolism.
- Jalaukavacharana increases blood flow by its anti-coagulant properties which enhance the local circulation and also provide the nutrient.
- Leech application improves blood circulation and reduces congestion due to presence of vitiated doshas. Leech application has peripheral vasodilator effect due to presence of vasodilator constituent in the saliva which improves blood circulation.
- Leech application has Anti-inflammatory action on nerves due to presence of substance like Bdelins and Eglins in the saliva.
- The enzymes in its saliva has got anti-inflammatory and anaesthetic properties which helps in

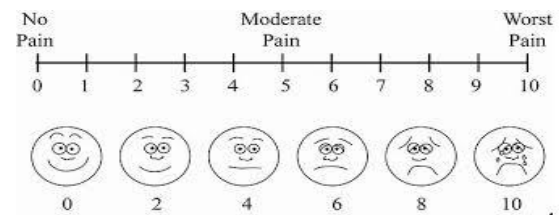
reducing pain, redness, raised local temperature, tenderness and helps in relieving tissue congestion. The therapeutic effect is not from the blood taken in the meal, but from the continued and steady bleeding from the wound left after the leech has detached, and the anesthetizing, anti-inflammatory, and vasodilation properties of the secreted leech saliva

This procedure was done for 5 days before wound debridement and after 6 days of wound debridement, daily for 10 days and granulation was observed and assessed by following criteria.

Assessment criteria:

1) **Vedana / Pain** - calculated by visual analogue scale¹⁰.

Gradation of assessment criteria



2) **Akruti / Size and shape** – Calculated by Kundin's formula¹¹ -

$$A_{km} = L \times W \times 0.785 \text{ mm}^2$$

To avoid error in calculation, surface area was calculated on day 1 observation and on 15th day of observation.

On day 1- Surface area of wound was- 6280 mm².

On day 15 - Surface area of wound was- 2355 mm².

3) **Depth** - Measured by depth gauge in mm

Parameters for assessment	Gradation Criteria of observations ¹²			
	0	1	2	3
Kandu/Itching	No itching	Itching sometimes a day	Itching whole day but not disturbing sleep	Sever itching disturbing sleep
Vranatala/Wound bed	Smooth, irregular & with healthy granulation tissue	Smooth, irregular, slight discharge & less granulation tissue	Rough, regular wet with more discharge & having slough	Rough, irregular with profuse discharge & much slough
Gandha/Odor	No smell	Bad smell	Tolerable unpleasant smell	Foul smell which is intolerable

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Strava/Discharge	The gauze is slightly moist	Bloody/sanguineous discharge	Sero-sanguineous discharge	Sero purulent
Varna/Granulation tissue	Pinkish red	Slight pinkish red	Slight Yellowish	Yellow to blackish

Observation table:-

Parameters for assessment	B.T.	A. T.				
		3rd	6th	9 th	12 th	15th
Vedana/ Pain	100%	70%	60%	40%	20%	10%
Kandu / Itching	1	1	0	0	0	0
Depth	12mm	10mm	8mm	6mm	4mm	2mm
Vranatala / wound bed	2	2	1	1	0	0
Gandha / odor	3	3	2	1	0	0
Strava /Discharge	2	2	1	1	0	0
Varna/ Granulation tissue	3	3	2	2	1	0

Discussion and Results –



Post-surgical debridement



On day 7 of leech therapy



Prepared wound bed -on day 15

According to T.I.M.E. principle of wound management¹³, The TIME table summarizes the four main components of wound bed preparation- 1)Tissue management 2)Control of infection and inflammation 3)Moisture imbalance 4)Advancement of the epithelial edge of the wound. The TIME framework is a useful practical tool based on identifying the barriers to healing and implementing a plan of care to remove these barriers and promote wound healing. In a chronic wound, debridement is often required more than once as the healing process can stop or slow down allowing further devitalized tissue to develop.

Tissue management was done with trifala kwatha dhawana, daily dressings and leech therapy prior to doing surgical debridement. Before debridement on day 5 only, patient got 70% pain relief which was analyzed by VAS scale and 50% to 60% reduction in inflammation around wound. Afterwards, control of infection and inflammation was achieved with antibiotic coverage i.e. tab co-amoxycylav 625 mg twice daily according to HIC(hospital infection control) policy and tab trifala guggulu 500mg twice daily. Moisture imbalance was covered with dry dressings daily for 5 days and advancement of the epithelial edges of

the wound was assessed daily by observation of length, breadth and depth of the wound and leech therapy done daily for 10 days. The observation table elicits the relief in pain by 80% upto the end of treatment. Itching was found to be regressed by day 5 of treatment. Depth of the wound was found to be 12 mm on day 1 and 2 mm on day 15 of treatment. Hence Vranatala was prepared.

At this point of time, patient was absolutely free from pain and healthy pinkish granulation tissue and well differentiated smooth wound bed, with no smell, no any discharge, no signs of inflammation around wound was found. There is about 80% improvement in wound bed and healthy granulation was found. After wound bed preparation, this vrana was labeled as Shuddhavrana which was ideal for twakasandhan karma according to Acharya Sushruta¹⁴. So we explained the patient benefits of skin grafting at this stage and the patient gave consent for it. Electively skin grafting was done on right heel with graft taken from right thigh. Patient was observed for 10 days in IPD with proper post op wound care, general care and systemic antibiotic therapy for 5 days. Later patient was discharged from hospital and after repeated 3 days follow up for 2 weeks, it was found that the graft was well accepted.





Graft well accepted after 14 th day of skin grafting



On 25 th day of wound bed preparation and skin grafting

Conclusion -

Leech therapy (Jalaukavcharana) is significantly effective in pain management and in enhancing healthy wound bed preparation for skin grafting. Thus 'Leech therapy' proves as a cost effective, time saving, affordable and acceptable treatment. Though treating chronic non healing wound is a difficult task, we have managed to treat it with 'Leech Therapy' along with conventional

(Ayurvedic) methods of wound care and an integrated approach in patient care.

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