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Case Study

A CASE REPORT ON EFFECT OF *DHOOPANA* IN NON-HEALING VENOUS ULCER

Anu K Thankappan[1]*, Deepa M S[2], Aneesh S[2]

*[1]PG Scholar, [2]Associate Professor, Department of Shalyatantra, Government Ayurveda College, Thiruvananthapuram, Kerala, India.

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ABSTRACT

An ulcer is defined as a break in the continuity of the skin or mucous membrane. Non-healing ulcers are those that do not follow the normal healing process and show no signs of healing after 4 weeks. Non- healing ulcers align with the symptoms of *Dhushta Vrana*, which include features like *Dheerghakalanubandhi* (chronicity) and *Poothipooyasrava* (purulent discharge), *Athyartha Vedana*. These symptoms are similar to those seen in non-healing ulcers. *Dhoopana* is recommended for wounds with severe pain, exudation, and a predominance of *Vata dosha*. In *Bhavaprakasha, Nimbapathradi Dhoopana* is described, involving ingredients such as *Nimbapathra* (neem leaves), *Vacha, Hingu, Sarpi* (ghee), *Lavana*, and *Sarshapa* (mustard seeds). These ingredients have actions such as antimicrobial, wound healing, pain-relieving, and which help reduce microbial load and alleviate pain. In modern science, *Dhoopana* is analogous to the process of fumigation. The main purpose of *Dhoopana* is to control the spread of infections by sterilizing or fumigating critical areas, such as operation theaters and labor rooms. In a case study of a 85-year-old male patient with a non-healing venous ulcers (2 in number) on the medial aspect of the left lower limb, *Dhoopana* with *Nimbapathradi Choorna* was applied for 10 days, twice daily, for 10 minutes. Pain and discharge were assessed using a Visual Rating Scale (VRS) and grading scale, respectively. After the study period, there was significant relief in pain and discharge. Additionally, microbial cultures revealed that the bacteria Klebsiella pneumoniae and Pseudomonas aeruginosa, present before treatment, were absent after the treatment period.

INTRODUCTION

Vrana, derived from the root "*Vran*," refers to the splitting or tearing of the body, leading to a break in the skin and underlying tissues[1]. In Ayurveda, two types of *Vrana* are recognized: *Sharira* (endogenous) and *Aganthu* (exogenous). *Sharira vrana* results from the vitiation of *Doshas (Vata, Pitta, Kapha, Raktha,* and *Sannipatha),* while *Aganthu vrana* is caused by external factors like assaults, injuries, or exposure to fire and chemicals[2]. In Ayurvedic literature, chronic non healing ulcers are generally described under the heading of *Dushta vrana*. It has a significant challenge in wound management due to their prolonged healing time, recurrent nature, and susceptibility to secondary infections.

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Venous ulcers are primarily due to chronic venous insufficiency, where the veins present in lower limbs fail to return blood effectively to the heart. The most common underlying reason is incompetence of venous valves, which leads to retrograde blood flow and sustained venous hypertension[3]. Over time, this elevated pressure damages the capillaries and surrounding tissues, impairing oxygen and nutrient delivery, and predisposing to ulcer formation typically near medial malleolus. Conventional wound care often involves antimicrobial agents and compression therapy, yet issues such as antimicrobial resistance, delayed granulation and persistent exudation and pain remain prevalent. Surgery is considered when conservative management fails, but some individuals may opt for alternative approaches. In Ayurveda, *Dhoopana* is a treatment measure for wounds with severe pain, exudation, and a predominance of *Vata dosha*. Through *Dhoopana* can reduce the microbial load, discharge and pain present in the *Vrana*.

CASE REPORT

A 85-year-old male patient presented to the outpatient department (OPD) with a non-healing venous ulcer that had been persisting for 3 years. The ulcer, located on the medial aspect of the left lower limb, was associated with pain and discharge. Despite receiving treatment from both allopathic and homeopathic systems over the past three years, the ulcer had not shown signs of healing and he came here for better management.

Past history– H/O DM (under medication) General examinations

General condition– Normal

Built – Moderate

Blood pressure– 130/90

Pulse rate – 72/min

Respiratory rate– 18/min

Heart rate – 72/min Investigations done

FBS, PPBS, CBC -WNL

Local examination

Location- Medial aspect of left lower limb near medial malleolus

Size & shape of ulcer– 1. 3cmx2cmx0.1cm (medial malleolus).

2. 2.5cmx1.5cmx0.1cm (above medial malleolus)

Discharge– Purulent discharge Floor– covered with slough, reddish

Edge – Slopping

Base – Muscle

Margin – Irregular

Surrounding skin- Dry blackish discolouration

Tenderness – Grade 2

Bleeding – Absent

Methodology

Therapeutic intervention

Using *Nimbapathradi choorna dhoopana* was done in a non-healing venous ulcer of leg twice daily for 10minutes for 10 days. Effect of *Dhoopana* with *Nimbapathradi choornam* in reducing pain was assessed by verbal rating pain scale, reducing discharge was assessed by grading of discharge and microbial load was assessed by swab culture VRS rating.

Score	Symptom	VRS rating
0	No pain or discomfort	No pain
1	Feeling pain but requires no medication	Mild pain
2	Bearable pain for some extends requires no medication	Moderate pain
3	Unbearable pain	Severe pain

Discharge

a. Amount

Grade 0: No discharge.

Grade 1: Mild- If *Vrana* wets 1 sterile pad of 4x4cm size.

Grade 2: Moderate-If *Vrana* wets 2 sterile pads of 4x4cm size.

Grade 3: Profuse discharge-If *Vrana* wets more than 2 sterile pads b. Type

- Bloody- Thin, bright red
- Serosanguineous- Thin, watery, pale red to pink
- Serous- Thin, watery, clear
- Purulent- Thin or thick, opaque tan to yellow
- Foul purulent- Thick, opaque yellow to green with offensive odour.

Details of drug

Nimbapathradi dhoopana is explained in *Vranashodhadhikara adhyaya* in *Bhavaprakasha madhyamakhanda*. *Nimbapathra, Vacha, Hingu, Sarpi, Lavana* and *Sarshapa* are the ingredients of *Nimbapathradi dhoopa*.

Drug	Botanical name	*Rasa*	*Guna*	*Virya*	*Vipaka*	*Karma*
Nimbapathra	*Azadirachta Indica*	*Thiktha Kashaya*	*Laghu Rooksha*	*Seetha*	*Katu*	*Krumihara, Vranahara, Kushtahara, Vishanuth*
Vacha	*Acorus Calamus*	*Katu, Tiktha*	*Laghu, Theekshna*	*Ushna*	*Katu*	*Janthuhara, Krimihara*
Hingu	*Ferula Asafoetida*	*Katu*	*Laghu, Snigdha, Teekshna*	*Ushna*	*Katu*	*Vatakaphagnam, Soolaprasa Manam*
Sarpi	*Butyrum Departum*	*Madura*	*Snigdha Mridu Guru Soumya*	*Seetha*	*Madura*	*Twachya, Vi Sahara, Vath, Apitha Prashaman*

Lavana	*Rock Salt*	*Lavanam Svadu*	*Laghu Snigdha*	*Seetha*	*Madura*	*Vrana Nasana, Thridosha, Samaka*
Sarshapa	*Brassica Alba*	*Thiktha*	*Teekshna*	*Ushna*	*Katu*	*Kandughna*

Preparation of trial drug

Equal quantities of *Nimbapathra, Vacha* (rhizome), *Hingu niryasa, Lavana* and *Sarshapa* are powdered well and taken to a *Sarava. Ghritha* will be added to the mixture and is applied to a plain gauze and make into a *Varthi* and burnt. After burning *Varthi*, fumes were directed to the ulcer by an open paper cone.

Details of intervention

Patient was subjected to *Vrana dhoopana* with *Nimbapathradi choorna* for 10minutes, twice a day for a period of 10 days continuously.

Poorvakarma

Patient was made to lie comfortably. ulcer and its surroundings area were exposed and cleaned using distilled water.

Pradhanakarma

Mixture of medicines are lighted to produce fumes and is directed to the ulcer with the help of a paper cone. Procedure was continued for 10 minutes.

Paschathkarma

Ulcer was covered with a sterile pad. Gauze bandaging was done for avoiding contamination. Assessment *Dhoopana* will be done for 10 minutes, twice a day for a period of 10 days.

The outcome measures, microbial load was assessed before and after the *Dhoopana* that is 0th day and 11th day.

1. Pain was assessed during 0th, 3rd, 7th, 11th day
2. Discharge was assessed during 0th, 3rd, 7th, 11th day

Figure 1: Ulcer on 0th day

Figure 2: Ulcer on 3rd day

Figure 3: Ulcer on 11th day

figure 4: Ulcer after 2 weeks

Figure 5: Ulcer after 1month

RESULTS AND DISCUSSION

The outcome parameters were assessed on the 0th day before the treatment, 3rd day, 7th day and 11th day at the end of study period. The following observations and results are enlisted below.

Day	Pain-VRS	Discharge Grade	Discharge type	Pus culture
0	3	2	Purulent	Moderate pus cells/OIF, Gram negative bacilli seen. Heavy growth of klebsiella pneumoniae and pseudomonas aeruginosa.
1	3	2	Purulent	
2	3	2	Purulent	
3	3	2	Purulent	
4	3	2	Purulent	
5	2	2	Purulent	
6	2	1	Purulent	
7	1	1	Serous	
8	1	1	Serous	
9	0	1	Serous	
10	0	0	Serous	
11	0	0	Serous	Occasional pus cells, no definite organism seen, no growth after 3 days of incubation.

DISCUSSION

Non-healing venous ulcers are a prevalent clinical condition which cause a great impact on physical and mental health of an individual. Ulcers take much more time to heal or may even become non healing due to persistent microbial activity, inadequate wound care resulting in prolonged suffering. In Ayurveda, ulcer and its treatments are coming under the topic *Vrana*. *Dheerghakalanubandhi, Poothipooya srava, Athyartha vedana* etc. are the cardinal features of *Dhushtavrana* that can be correlated with the symptoms of non-healing ulcer. Here *Dhoopana* with *Nimbapathradi choorna* is taken in the study. Incorporating the action of *Dhoopana* and also the drugs present in the *Choorna*, which possess, *Krimihara vranaghna raktha sodhaka* and *Visaghna* properties thereby reducing the microbial content and associated symptoms like pain and discharge. *Dhoopana* involves application of heat, so *Ushnatva* of *Dhoopana karma* may help in reducing *Vata* related pain. It helps to fastens the wound healing by reducing the need for antibiotics, thereby minimizing the risk of antibiotic resistance. It is of low risk and safe to use and cost effective. Therefore, this study was chosen to assess the efficacy of *Dhoopana* In reducing microbial content and management of pain in non-healing venous ulcers exploring its potential benefits as a complementary therapy.

DISCUSSION ON OUTCOME MEASURES

Effect on microbial load

Chronic ulcers often harbor biofilms, complex microbial communities encased in a protective matrix of proteins and polysaccharides. The drugs used in treatment possess properties that counteract biofilm formation and microbial growth[8]. The predominant Rasa of the drugs, including *Katu, Tikta*, and *Kashaya*, contribute to reducing *Kledatva* (moisture) and *Krimi* (microbial load). Potentially disrupting the superficial layer of biofilms and keeping the ulcer clean. Additionally, the drugs exhibit properties like *Krimihara, Vranahara, Dushtavranavishodhana, Dourgandhyahara*. These properties work synergistically to create an environment inhospitable to microbial growth, ultimately rendering the ulcer microbial-free and promoting healing.

Effect on discharge

- Antimicrobial action: The medicated smoke from *Dhoopana* may have antimicrobial properties, reducing bacterial load and infection, which can contribute to discharge.
- Anti-inflammatory effects: *Dhoopana's* anti-inflammatory properties may help reduce inflammation, subsequently decreasing discharge.
- Drying effect: The smoke may have a drying effect on the ulcer, reducing moisture and discharge.
- Promoting healing: By creating an aseptic environment and promoting wound healing.

Effect on pain [9]

Dhoopana (medicated fumigation) involves the application of heat, and the *Ushna* (hot) nature of this therapy, combined with the *Katu* (pungent) and *Theekshna* (sharp) qualities of the herbs used, may

help balance *Vata dosha*, thereby reducing pain. In cases of chronic non-healing ulcers, ongoing vasoconstriction can lead to reduced oxygen supply (tissue hypoxia), which worsens pain and delays healing. The heat generated during *Dhoopana* promotes vasodilation, improving blood circulation and oxygen delivery to the ulcerated area. This improved oxygenation helps reduce oxidative stress, supports tissue regeneration, and eases pain.

Furthermore, the herbal components used in *Dhoopana*- rich in alkaloids, flavonoids, glycosides, and volatile oils- may possess anti-inflammatory and analgesic properties. These bioactive compounds help combat microbial infection, reduce discharge, and relieve inflammation and pain associated with the ulcer. The *Ushna virya* and *Snigdha guna* of the drugs used might contribute to reducing the pain. *Katu rasa* helps in the removal of Krimi or microorganisms and promotes *Vrana sodhana, Tikta rasa* helps in *Upashoshana* of *Pooya* or reducing discharge, *Kashaya rasa* by its properties like *Ropana, Sodhana, Sthambhana, Lekhana* and *Kledopashoshana* helps in reducing the discharge and keeping the ulcer clean.

CONCLUSION

An ulcer with infection, microbes always display symbiotic interactions that enhance the colonization, virulence and persistence. Common causes of delayed wound healing are infection associated with pseudomonas aeruginosa and staphylococcus aureus. These bacteria tend to form biofilms which are very complex structures of microorganisms that adhere to the surface, creating a protected environment for them. These biofilms which resist antibiotics and degradation by the neutrophils. Compared to modern surgical treatments for ulcers *Dhoopana* is cost effective and easy to perform.

Dhoopana with *Nimbapathradi choorna* is less expensive compared to these treatments and found to be effective in reducing pain, discharge and microbial load in non-healing ulcers with 10 days of *Dhoopana*. The organism, klebsiella pneumoniae and pseudomonas aeruginosa which was found in the first pus culture, was not seen in the pus culture took after 10 days of *Dhoopana*. Through *Dhoopana*, reduce the microbial load and prevented the ulcer from further contamination of microorganisms during the period.

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***Address for correspondence**
Dr. Anu K Thankappan
PG Scholar
Department of Shalyatantra,
Government Ayurveda College,
Thiruvananthapuram,
Kerala, India.
Email: anuktkt@gmail.com