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ORIGINAL ARTICLE

Management of Non-Healing Pressure Sore with The Help of Ayurvedic oral Formulations and Vranadhoopan (Herbal Wound Fumigation) Locally: A Case Report

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ABSTRACT
Acharya Sushruta, the 'Father of Surgery,' established foundational principles for managing complex ulcers like Dusta Vrana, characterized by severe pain, foul odor, delayed healing, and discharge. He advocated sixty measures (Shashti Upkramas), including Vranadhoopan (herbal wound fumigation), for treating such conditions. This study discusses the successful Ayurvedic management of a pressure sore complicated with thick eschar formation, which eventually got infected, in a 69-year-old woman. The patient sustained a pressure sore on her right thigh six months prior, leading to a thick eschar and foul-smelling discharge. Advised escharotomy and skin grafting, she opted for Ayurvedic treatment at Parul Ayurveda Hospital, Parul University, Vadodara. After clinical evaluation, the treatment involved gradual eschar resection, local application of Vranadhoopan, Jatyady ghruta tulle dressings, and oral herbal formulations to control infection, inflammation, and pain. Within 10 days, her clinical condition significantly improved, with no need for escharotomy or costly interventions. The wound healed completely in 60 days. Modern treatments like escharotomy with skin grafting require anesthesia, advanced facilities, and incur high costs. This case report highlights the effectiveness of Ayurvedic therapies in managing complicated wounds in patients unwilling for surgical interventions, ensuring cost-effective, result oriented and safe management.
Keywords: *Pressure sore, Dusta vrana, Vranadhoopan, Herbal wound fumigation, Jatyadi tulle, Case report.*

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INTRODUCTION

A wound is an interruption to the skin's or mucous membrane's continuity or a change to the underlying tissue's integrity. It may result from a surgical incision, trauma, friction, pressure, or inadequate blood flow. Wound healing is a mechanism where the body tries to restore the integrity of the injured portion. However, variables like slough, infection, and foreign bodies impede the process of normal healing. The wound having delayed healing is coined as *Dusta Vrana* in *Ayurveda. Acharya Sushruta* through his text '*Sushruta Samhita'* elaborated the basic principles of surgery. He has emphasized the importance of the management of various wounds in surgical practice. For the treatment of wounds, *Acharya Sushruta* has described *Shashti Upkrama (sixty measures of wound healing)*. These measures include dietary restrictions; procedures and medications for controlling the inflammation; surgical procedures like, excision, incision, debridement, puncturing, probing, extraction, drainage of pus, bloodletting and suturing; various formulations for application on the wound like herbal decoctions, medicated oils and clarified butters, powders of herbal and/or mineral origin, etc.; different methods to produce cosmetic scars.[1] One of these measures is *Vranadhoopana*.[2] *Vranadhoopana means treating* wounds which are having *Vata dosha* predominance, severe pain and foul smelling discharge with the help of *dhoopa* (herbal fumes)[2]. Application of herbal fumes is really a novel way of drug delivery in wounds for the modern medical sciences. The plants containing volatile tars, resins and oils which on heating easily liberate out in the environment are used for *Vranadhoopana* [3]. This article discusses successful management of a case of 69-years-old female patient who had a pressure sore over her right thigh that sequentially developed a

thick, stable eschar which further got infected and complaints of pain and foul-smelling profuse discharge at the margins of the eschar appeared. As the patient was reluctant to modern surgical intervention, wound was treated with Ayurvedic systemic and local treatment.

PATIENT INFORMATION

A 69-year-old widowed woman presented with a nonhealing wound on her right thigh persisting for over six months, with malodorous discharge for more than two months. The wound originated as a pressure sore during a horse ride on a pilgrimage to Kedarnath, accompanied by high-grade fever and painful blisters within 24 hours. Initial management with modern medicines and topical ointments provided some relief, allowing her to complete her tour despite mild to moderate pain and restricted mobility. Upon her return, a thick leathery eschar had developed at the site. The patient was advised escharotomy and potential skin grafting under anesthesia by a general surgeon but she declined surgical intervention. Over time, the eschar worsened with increased pain and foul-smelling discharge. Seeking an alternative approach, she opted for Ayurvedic treatment at Parul Ayurved Hospital. After thorough evaluation, the treatment plan included oral herbomineral formulations, local Vranadhoopana (herbal fumigation), and Jatyadi Ghrut tulle application. Written informed consent was obtained before initiating treatment.

Past history- No past history of any diseases likes Tuberculosis, Hypertension, Diabetes mellitus. There was no history of any medication allergy or food allergy. Also, there was no significant family history either.

Personal History- The patient consumed mix diet, constipated bowel habits along with disturbed sleep.

On examination- *Bala – Madhyama, Prakriti – Vata pitta*, Sleep pattern – disturbed, addiction – tea 2 times/day, Appetite – *madhyama*, the details from *Astavidha pariksha* was recorded like *Nadi* (pulse rate) – 80 / min, *Mutra* (urine) – 3-4 acts per 24 hrs, *Mala* (stool) – once or twice per day, *Jihva* (tongue) – *Sama* (mildly coated), *Shabda* (speech) – normal, *Sparsha* (touch) – *Ushna*, *Druka* (eyes) – normal, *Akruti* (built) – *Madhyama*.

General Examination- General examination showed limping gait at right lower limb. Pallor, Icterus, cyanosis, oedema and clubbing were absent. Respiratory rate was 20/min, BP – 124/86 mm of hg, Heart rate was 82/min, and temperature was 96.8^0 Fahrenheit.

Systemic examination- Patient was conscious and fully oriented to time, place and person. No abnormality in cardio vascular system was noted. Examination of Respiratory system showed clear chest with bilateral equal air entry and no wheezing. Abdomen showed no scar marks or distension. Umbilicus was normal. Abdomen was non-tender; normal bowel sounds were auscultated.

Local examination- On Inspection, large wound (18cm x 12cm x 1/2cm) was present at medial side of right upper thigh covered with an eschar elevated marginally but fixed centrally. There was mild to moderate pain, tenderness and foul-smelling profuse discharge from the elevated margins of the eschar.

Laboratory Investigations- (table 1).

Table 1 Laboratory Investigations

Investigations	**Day 1** 10/09/22	**Day 10** 20/09/22	**Day 30** 10/10/22
HB gm %	12.0	11.7	12.1
TLC /cu mm	8000	5200	4800
Polymorphs %	81	65	57
Lymphocytes %	13	25	34
Eosinophils %	1	4	4
Monocytes %	5	6	5
HIV, HBsAg, VDRL	Negative (only done prior to commencement of treatment)		

Diagnosis- Patient was diagnosed as *Dusta Vrana*

Treatment plan-

Systemic Medicines- Herbo-mineral formulations prescribed to be taken by oral route are enlisted in table 2.

Table 2: Oral medications

Sr. No.	**Medicine**	**Dosage**
1	Tab. Septilin	2-0-2 after food
2	*Panchwakala Kashaya*	15ml – 0 – 15ml after food
3	Tab. *Gandhak Rasayan*	2 – 0 – 2 after food
4	Tab. Zerodol – p	SOS

Local treatment- Herbal wound fumigation was carried out with the *Vranadhoopan* formulation containing Neem leaves *(Azadirachta indica)*, Rhizomes of *Vacha (Acorus calamus)*, Seeds of *Gaur sharshapa (Sinapis alba)* and Olio resins of *Guggulu (Commiphora mukul)*. Immediately after *Vranadhoopan*, tulle prepared by *Jatyadi Ghrut* were applied over the wound.

Purvakarma (Pre-procedural Preparations)	Pradhan Karma (Actual Procedure)	Pashat Karma (Post-procedural Care)
All the necessary dressing material, presterilized gauze piece and pads, bandages were gathered. • *Jatyadi Ghruta* tulle kept ready by soaking sterilized gauze pieces in warm and liquified *Jatyadi Ghruta.* • Sterile water was taken in a sterile bowl. • The patient was seated in a chair Comfortably so that the wound was properly exposed to the fumes. Previous dressing was removed. • *Vranadhoopan* formulation was kept in *Vranadhoopan Yantra* (device for wound fumigation) [4] and heated to generate fumes.	• The wound was cleaned with sterile water for injection. • As sufficient quantity of fumes generated from *Vranadhoopan dravyas* the area was covered to prevent the loss of fumes. • The wound site was exposed to the fumes by keeping at least one foot distance between the heating source and the wound site (Picture 4). • The *Vranadhoopan* was given to the patient for 20 minutes initially twice a day and after significant reduction of pain, foul smell and discharge (14^{th} day) once a day for next 10 days. Then after frequency was reduced to one day alternate and then to twice a week for 10 days. 45^{th} day onwards frequency of dressing was reduced to twice a week and *Vranadhoopan* was given once a week till complete healing of the wound.	• *Vranadhoopan Yantra* was kept away. • 2-3 *Jatyadi Ghrut* tulle were kept on the fumigated wound. • Dry sterile gauze pieces and pads were exposed to the fumes. • These fumigated gauze pieces and pads were used to dress the wound. • Dressings were secured with the help of adhesive tape.

Figure 1. Procedure of *Vranakarma* (Dressing)-

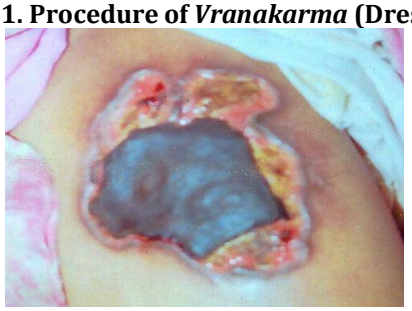

Image 1: Day 1, After marginal excision of easily separable eschar with surgical blade number 11

Image 2 **Image 3**

Image 2: Day 14, Prior to Vranadhoopan

Image 3: Day 14, Post Vranadhoopan

Image 4: Method of *Vranadhoopan* (Day 14)

Image 5: Day 18 post *Vranadhoopan*

Image 6: Day 38 Prior to *Vranadhoopan*

Image 7: Day 45 After *Vranadhoopan*

Image 8: Day 50 Prior to *Vranadhoopan*

Image 9: Day 60 Healed wound

Follow ups

Follow up was done on every 15th day for 2 months after complete healing of the wound. There was no recurrence of any symptoms during follow up period.

Outcomes

A noteworthy outcome was achieved by submitting the wound to *Vranadhoopan*. During the treatment patient's improvement was closely observed and parameters were recorded in specially prepared case record form. The assessment parameters were as per table 3.

Table 3 Parameters for assessment

Assessment parameter		**Grade**			
		0	**1**	**2**	**3**
Pain		No Pain	Mild Pain	Moderate Pain	Severe Pain
Size		Healed Wound	0.1-25cm^2	25.1-100cm^2	>100.1cm^2
Skin Colour Around Ulcer		Normal skin colour	Brown	Purple, bluish	Blackish, scale formation
Floor (Slough)		No slough	Thin layers separated easily	Patches of slough	Floor totally filled with pus and slough
Margin		At normal levels	Mildly raised	Moderately raised	Edematous and Considerably raised
Discharge	a. Quantity	No discharge	Scanty discharge	Moderate discharge	Severe discharge
	b. Appearance	No discharge	Serous	Sero-sanguineous	Pus Discharge
Odour		No odour	Mild odour	Foul odour immediately after removing dressing	Severe odour even the wound is dressed
Tenderness		Nontender	Pain on deep palpation	Pain on superficial palpation	Doesn't allow to touch at all

It was observed that the eschar was gradually separated itself from the wound from edges. The separated eschar was trimmed with the scissors every day till the wound was eschar free. It took 10 days to complete removal of the eschar and the slough, malodor and pain also reduced significantly till 14th day of treatment. (Table 5). Here patient was given systemic medicines via oral route (Table 2). It is clear that there was no need of antibiotics during the whole course. No analgesic medicine was required after day 2

(Table 5). On the 10th day, there was reduction in WBC and polymorphs count (Table 1). Hence, it is clear that there was decrease in infection after commencement of the *Ayurvedic* treatment. The volatile contents of the *Vranadhoopan dravyas* with their pleasant fragrance provided soothing and fresh environment during the procedure. 14thday onwards the depth and size of the wound were also reduced gradually and the wound was promoted to healthy wound state (*Sudhha Vrana Avastha*) (Images no. 3 and 5 to 9).

Table 4. Observation of parameters during assessment

Sr. No.	Assessment parameter	Day 1 10/09/22	Day 10 20/09/22	Day 20 30/09/22	Day 30 10/10/22	Day 40 20/10/22	Day 50 30/10/22	Day 60 10/11/22
1	Pain	3	2	1	1	0	0	0
2	Size	3	3	3	3	2	1	0
3	Skin Around Ulcer	3	2	2	2	1	1	0
4	Floor (Slough)	3	2	2	1	0	0	0
5	Margin	3	2	1	1	0	0	0
6	Discharge a	3	2	1	1	0	0	0
	b	3	2	2	1	0	0	0
7	Odour	2	1	1	0	0	0	0
8	Tenderness	3	2	1	1	1	0	0

Table 5. Requirement of analgesics

Day	0	2nd	4th	6th	8th	10th
Requirement of Tab Zerodol P	BD	OD	-	-	-	-

Table 6: Timeline of events

Date	Event and outcomes.	Management
18/03/2022	Patient developed pressure sore on her right thigh during a horse ride on a pilgrimage to Kedarnath, followed by high-grade fever and painful blisters within 24 hours.	Initial management with modern medicines and topical ointments provided some relief, allowing her to complete her tour though she had mild to moderate pain and restricted mobility.
26/03/2022	Patient returned to home from pilgrimage. A thick leathery eschar had developed at the site.	She consulted to a general surgeon and was advised escharotomy and potential skin grafting under anesthesia. Patient was not willing for surgical intervention and continued with eschar.
15/07/2022	Over time, the eschar worsened with increased pain and foul-smelling discharge.	Patient visited her family doctor who referred her to another general surgeon. Escharotomy, debridement and skin grafting after appearance of healthy granulation tissue was advised. Patient still was reluctant to surgical intervention.
10/09/2022	As patient still was not willing for surgical intervention, she visited Parul Ayurved Hospital for Ayurvedic treatment. She presented with large wound (18cm x 12cm x 1/2cm) at medial side of right upper thigh covered with an eschar elevated marginally but fixed centrally. There was moderate pain, tenderness and foul-smelling profuse discharge from the elevated margins of the eschar.	After thorough evaluation, the treatment plan included oral herbomineral formulations (Table 3), local *Vranadhoopana* (herbal fumigation), and *Jatyadi Ghrut* tulle application. The separated edges of eschar were trimmed off as far as possible. Laboratory investigations were done (Table 1). **Informed written consent was obtained before initiating treatment.**
20/09/2022	Eschar gradually separated easily and wound was totally eschar-free. Lessening of discharge, foul smell and discharge were observed. Good improvement in patient's General condition was noted.	The eschar was trimmed bit by bit daily as it was getting separated from edges gradually. Follow up Laboratory investigations were done. Oral medicines were continued.
24/09/2022	Remarkable improvements noted in pain, malodour and discharge as healthy granulation tissue started to appear. (Figure 2, 3)	Frequency of *Vranakarma* (dressing) reduced to once in a day for next 10 days. Oral medicines continued.

04/10/2022	With healthy granulation tissue, wound was in healing phase. Very mild pain and discharge, no foul smell.	Frequency of *Vranakarma* was reduced to one day alternate per week. All the oral medicines continued except Tab Septiline.
14/10/2022	Reduction of wound size from edges along with reduction in depth was noted. Only central core of 7.5x5 cm^2 with scanty discharge and pain only on deep pressure was present	Frequency of *Vranakarma* was reduced to twice a week. Tab. Gandhak Rasayan and Panchawalkal Kashay continued.
24/10/2022	Remarkable reduction in wound size was there. (5x3.5cm^2)	Frequency of *Vranakarma* was reduced to once per week.
10/11/2022	Wound was completely healed.	*Vranakarma* and all the oral medicines were stopped. Patient was advised to visit Shalyatantra OPD after 15 days for follow up.

Adverse and unanticipated events

During the whole course, there was not a single adverse or unanticipated event.

DISCUSSION

Acharya Sushruta lists sixty measures (*Shashti Upkramas*) for *Dusta Vrana's* management.[1] Among these measures is *Vranadhoopan*. *Vranadhoopan* having *Agni-Vayu Mahabhuta Pradhanata* and is recommended for the treatment of wounds that are extremely painful, having foul smell and discharge a lot. Simply said, *vranadhoopan* can be coined as herbal wound fumigation. *Ghrut Kalpana*, i.e., application of medicated ghee at wound site is another measure among *Shashti Upakramas*. The ghee is prepared with medicines either having cleansing, healing or both the properties is applied over the wound according to the phase of healing of the wound. After application of *ghruta*, *tail* or ointment, it advised to close the wound with sterile dressing. Use of sterile piece of gauze while closing the wound with dressing is very common now a days. To assure long term contact of *Jatyadi Ghruta* with wound bed, we prepared *Jatyadi* Tulle by impregnating the presterilized gauze piece into warm and liquified *Jatyadi Ghruta.*

In this study, Tab. Septilin, Tab. *Gandhak Rasayan, Panchawalkala Kashay* were prescribed as oral medications. *Vranadhoopan* and Jatyadi Ghrut Tulle were used for local application. The wound was closed with dressings fumigated with *Vranadhoopa.*

Probable mode of action of internal medicines-

Composition of Tablet Septilin

1. Extracts of *Maharasnadi Kashay* (130 mg), *Guduchi (Tinospora cordifolia)* (98 mg), *Manjistha (Rubia cordifolia)* (64 mg), *Amalaki (Emblica officinalis)* (32 mg), *Shigru (Moringa Pterygosperma)* (32 mg), *Yashtimadhu (Glycyrrhiza glabra)* (12 mg)
2. Powders of *Guggulu (Balsamodendron mukul)* Oleo-Gum-Resin (0.324 g), *Shankh bhasma* (64 mg)

Probable mode of action-

Septilin is a polyherbal formulation known for its immunomodulatory, antimicrobial, anti-inflammatory, and antioxidant properties. It contains a blend of phytochemicals such as alkaloids, flavonoids, tannins, phenolic compounds, carbohydrates, and glycosides, which contribute to its therapeutic effects [5]. Septilin is commonly used to enhance immunity, support recovery from infections, and manage inflammatory conditions. It has been found effective in treating respiratory infections, sore throat, skin infections, and recurrent common colds. The presence of Tinospora (Guduchi), Licorice (Yashtimadhu), and Indian Bdellium (Guggulu) in its composition further strengthens its antimicrobial and healing properties [6]. *Godugdha* (cow milk), *Chaturjataka (Cinnamomum zeylanicum, Elettaria cardamomum, Cinnamomum tamala, Mesua ferrea), Guduchi (Tinospora cordifolia), Triphala (Terminalia chebula Retz., Terminalia bellerica Roxb. and Emblica officinalis), Shunti (Ziziber officinalis*- dried rhizomes*), Bhrungaraj (Eclipta alba), Ardraka (Ziziber officinalis*- wet rhizomes*)* are the ingredients of *Gandhaka rasayana vati.* Eight *Bhavanas* (triturative procedures) of each *Dravya* are given to *Shoditha gandhaka* [7]. *Gandhaka Rasayana* contains a rich blend of phytochemicals, including polyphenols, tannins, and saponins, which contribute to its therapeutic potential. Polyphenols, the most abundant, offer antioxidant and anti-aging benefits, potentially aiding in the prevention of cardiovascular diseases, cancer, and diabetes. Tannins and saponins further enhance its anti-inflammatory, antimicrobial, and immunomodulatory effects, reinforcing its wide-ranging applications in health and wellness [8]. It is traditionally used for skin disorders, wound healing, and immune modulation. Research suggests that Gandhaka Rasayana may activate fibroblasts, which are crucial for tissue repair, and modulate proteins involved in tissue remodeling, such as metallothioneins and tissue inhibitors of metalloproteases (TIMPs). These effects

contribute to its role in accelerating wound healing and improving skin health [9]. *Panchawalkala* (PWK) is a formulation made up of the bark of five trees viz. *Vata (Ficus bengalensis Linn.)*, *Udumbara (Ficus glomerata Roxb.)*, *Ashvattha (Ficus religiosa Linn.)*, *Parisha (Thespesia populenoides L.)* and *Plaksha* (*Ficus lacor Buch-Ham*.), having properties of *shodhana* (cleaning) and *ropana* (healing) of wounds.[10] The traditional *Panchawalkala kashay* (PWK) involves a daily fresh decoction made from five medicinal plants. Recent research has confirmed that PWK extracts exhibit antibacterial effects in vitro against various pathogens [11]. Both aqueous and alcoholic extracts of PWK contain bioactive compounds, contributing to their anti-inflammatory, antimicrobial, antiparasitic, antifungal, and wound-healing properties [12]. The herbs which are used for the *Vrnadhoopan* have *Ushna, Krimighna* and *Jantuhara* properties predominantly [13]. As *Vranadhoopan* is indicated for severe pain and profuse foul-smelling wounds [3], such wounds are present with ongoing inflammation so the purpose of *Vranadhoopan* seem to be wound cleansing and debridement which helps to reduce the inflammation and microbial load promoting wound healing. The *Vranadhoopan* therapy was administered for 20 minutes twice daily initially. After noticeable improvement by the 14th day, including reduced pain, foul odor, and discharge, the frequency was adjusted to once daily for 10 days. It was subsequently reduced to every other day and later to twice weekly over the next 10 days. From the 45th day onward, dressing frequency was reduced to twice weekly, and *Vranadhoopan* was given once a week until complete wound healing was achieved. This gradual approach ensured systematic recovery while addressing the patient's symptoms effectively.

Table 7. Ingredients of Vranadhoopan formulation and their properties-

Sr.No.	Name of herb (Part used)	Botanical Name	*Rasa*	*Guna*	*Virya*	*Vipaka*	*Karma*	Established activity against micro- organism
1	*Nimba [17] (leaves)*	*Azadirachta indica*	*Tikta, Kashaya*	*Laghu, ruksha*	*shita*	*Katu*	*krimighna*	*S. aureus, and more than P. mirabilis, P. aeruginosa, E. Faecalis[22]*
2	*Gour sarshap [18] (seeds)*	*Sinapis alba*	*Katu,tikta*	*laghu, snigdha*	*Ushna*	*Katu*	*Rakshoghna, Krimighna*	*antibacterial properties against Streptococcus pneumoniae and antifungal properties[23]*
3	*Guggulu [19] (resin)*	*Commiphora mukul*	*Katu, tikta, kashaya*	*Laghu, ruksha, vishada, sookshma, sara*	*Ushna*	*Katu*	*Krumijayeta*	*Bacillus -megaterium, Micrococcus luteus, Enterococcus faecalis, Staphylococcus aureus and fungal strains of Aspergillus niger, A.flavus, Candida albicans, Microsporum fulvum[24,26]*
4	*Vacha [20] (rhizome)*	*Acorus calamus*	*Katu, tikta*	*Laghu, teekshna*	*Ushna*	*Katu*	*Krimighna, Jantuhantri*	*Salmonella typhi, Pseudomonas aeruginosa, Klebsiella pneumoniae, and Staphylococcus aureus.[25]*

The components in *Vranadhoopan* formulation *i.e*., *Nimba, Gaur Sarshapa, Vacha and Guggulu* have antimicrobial and healing properties (Table 7) [14]. The *Laghu* and *vishada* properties helped the fumes to reach up to the minute gaps between the slough and wound surface and eventually removal of the slough. Previous researchers who worked on *Vranadhoopan* have proven that this formulation shows antimicrobial properties against *Staphylococcus aureus* [3,15,16], *Pseudomonas aeruginosa* [16], *Escherichia coli*.[16] Other researchers also claimed that *Vranadhoopan* is very effective to control the growth of other microorganisms.[14] It was observed that Granulation tissue production is promoted by *Vranadhoopan* leading to reduction in pain and discharge. *Dhoopan* causes vasodilatation, which permits blood circulation, *Dhoopan dravyas* have therapeutic powers and also exhibit anti-inflammatory, analgesic, and antibacterial characteristics due to the liberation of volatile oils after heating [3]. The fumigation process introduces volatile compounds that promote local circulation, reduce microbial load and stimulate healing. *Lekhana* activity, which aids in de-sloughing and encourages wound healing, is provided by *Nimba* due to virtue of its *tikta*, *kasaya rasa* and *laghu*, *ruksha* properties.[17] *Gugglu* having *katu rasa* and *ushna virya also* contributes wound healing [19]. *Rakshoghna* and *Krimighna* qualities of *Gaur Sharshapa* and *vacha* aid in lowering the microbial loads in the wound [18,20,14]. Ingredients of *Jatyadi Ghruta- Jati* (*Jasminum grandiflorum)* Leaves, *Nimba* (*Azadirachta indica*)Leaves, *Patol*

(*Trichosanthes dioica*) Leaves, *Kutaki* (*Picrorrhiza kurroa*) Root, *Haridra* (*Curcuma longa*) Rhizome, *Daruharidra* (*Berberris aristata*) Root, *Sariva* (*Hemidesmus indicus*) Bark of Root, *Manjishtha (Rubia cordifolia)* Root, *Haritaki (Terminalia chebula)* Fruit, *Siktha* (Bee's wax), *Tuttha (Copper sulphate), Yashtimadhu (Glycerrhiza glabra)* Root, *Karanja (Pongamia pinnata)* Seeds, *GoGhruta* (Cow ghee) Clarified butter. Jatyadi Ghruta aids wound healing by reducing dryness and inflammation while promoting crust formation. Research shows a higher re-epithelialization rate from day 5 onward in treated rats, along with faster granulation tissue maturation, fewer inflammatory cells, and early angiogenesis [21]. Applying Jatyadi Ghruta in tulle form prolonged contact with the wound, ensuring continuous moisturization and softening. This played a key role in eschar removal without surgery. Its ingredients enhanced the properties of volatile fumes, leading to faster recovery and optimal cosmetic scarring.

During the process of inflammation neutrophils release inflammatory cytokines to cope up with pathogens which in turn release ROS (Reactive Oxygen Species) to cope up with the microbes, but the myeloperoxidase which they produce is lethal not only to microbes, but to host cells also [27] further causing damage to DNA, lipids, proteins and Extra-cellular matrix (ECM) of host cell. Prolongation of neutrophils in wound tissue makes the wound having higher level of inflammatory cytokines. Even the wound discharge contains excess of proteases and ROS, hence this fluid itself may inhibit cell growth by breaking down factors in ECM [28]. The protease imbalance, together with aforesaid factors like ischemia and bacterial load make up to what is described in *Ayurveda* as *Dusta Vrana*. Any management of a wound to be effective should serve the following criteria; it should improve circulation, inhibit bacterial flora, improve oxygen availability, remove slough (dead tissue), should have anti-inflammatory properties and reduce oedema. During this study it was observed that the prescribed oral medicines along with *Vranadhoopana* and *Jatyadi* tulle application locally satisfies all these criteria for the management of *Dusta Vrana* and promotes the wound healing. This observation reconfirms the indications of *Vranadhoopana* quoted in *Sushruta Samhita* i.e., it reduces the pain and foul-smelling discharge from the wound.[29]

CONCLUSION

Considering the outcomes, it can be concluded that the treatment plan including *Ayurvedic systemic* and local medicines was very satisfying, easily applicable, soothing to the patient and safe. Further it can be said that, *Shashti Upakrama* procedures can be made more accessible and cost-effective by modifying the formulations and integrating with newer techniques.

The patient's perspective on the treatment received

During wound fumigation, the environment was full of fragrance and the patient and the staff felt very enchanting. The pain at the wound reduced remarkably after exposure to Vranadhoopan. The use of fumigated herbal dressings added a soothing effect and provides a comfortable healing environment.

Disclosure of interest

Both the authors declare that there are no any conflict/s of interest.

REFERENCES

1. Sushruta. (1997). Chikitsasthana (Edited by Ambikadatta, S.) Sushrut Samhita (Vol 1), Choukhamba Sanskrut Sansthan, Varanasi, p.4
2. Sushruta. (1997). Chikitsasthana (Edited by Ambikadatta, S.) Sushrut Samhita (Vol 1), Choukhamba Sanskrut Sansthan, Varanasi, p.10
3. Shirode, P., Mahajan, K., (2017). Role of *Vranadhoopan* in the management of chronic non healing ulcers under the influence of tab *Gandhak rasayan*. Int. J. Eng. Research and App., 7(12):13-17.
4. Shirode, P., (2018). Standardization of *Vranadhoopan* Treatment with Help of Modified *Vranadhoopan Yantra*. Int. J. Research Ayu. Med. Sci., 1(2):140-144.
5. Nigade, Ganesh. & Mane, Ms. & Mane, Ms. & Gambhire, Ms. & Patil, Ms. & Kunjir, Mr., (2023). Analytical Profile of herbal medicine-Septilin, an anti-infective tablet Section. European Chemical Bulletin. 12(9):1667-1676.
6. Udupa, A. L., Rao, S. G., Kulkarni, D. R., (1989). Wound healing profile of Septilin. Indian J Physiol Pharmacol., 33(1):39-42.
7. Shri Madhava. (2014). Arthavidyotini and Arthaprakashini Sanskrit and Hindi Commentaries (Edited by Shri Gulraj, S. M.) Ayurveda Prakasha, Chaukambha Bharati Academy, Varanasi, p.268.
8. Basaiye, N., Choudhary, A., Sakhitha, K. S., Ramnani, R., (2024). Characterization of Gandhaka Rasayana: A sulfur-based traditional medicine. jdras 9(Suppl 2): S198-S205.
9. Shetty, P., Kedukodi, P., Kamath, S., Udupi, V., (2020). Gandhaka rasayana: Possible role as a modulator of fibroblast cell function in wound healing. Int J Health Sci Res., 10(6):36-45.
10. Sharangadhara. (2000). Madhyamkhanda (Edited by Parushuram Shastri Vidyasagar) Krishnadas Acadamy,

Varanasi, p.16.
11. Joshi, J., & Vaidya, R. (2013). Panchvalkal: A monograph—Experimental & clinical studies on the use of modified Panchavalkal (an Ayurvedic formulation) in leucorrhoea. CCRAS Monograph, Chapter 1, p. 2.
12. Joshi, J., & Vaidya, R. (2013). Panchvalkal: A monograph—Experimental & clinical studies on the use of modified Panchavalkal (an Ayurvedic formulation) in leucorrhoea. CCRAS Monograph, Chapter 2, p. 35.
13. Khedekar, S., Goel, S., Ojha, N., (2016). Ayurveda Dhoopana (Medicated Smoke) Chikitsa in Present Scenario. Int. J. Res. Ayu. Pharm., 7(2):98-102.
14. Sumitha, L., Prasad, B., (2015). Evaluation of Antimicrobial and Antifungal Property of Dhoopana Karma (Fumigation)– By "Dhup" an Ayurvedic Dhoopana Product. IJPSR, 6(7):2950-2954.
15. Maisuriya, S., Karve, A., Shirode, P., (2023). An Antibacterial Effect of Herbal Fumigation Kwath on staphylococcus aureus, pseudomonas aeruginosa, Escherichia coli. Bull. Env. Pharmacol. Life Sci., 12(3):141-145.
16. Chakole, D. P., Kadar, N. M., (2018). Concept of sterilization in *Ayurveda* compendia. Ayurlog: Nat. J. Research in Ayu. Sci., 6(4):1-4.
17. Bhavamisra. (2015) Commentory by Chunekar, K. C. (Edited by Pandey, G. S.) Bhavaprakasa Nighantu, Choukhamba Bharti Academy, Varanasi, p.314
18. Bhavamisra. (2015) Commentory by Chunekar, K. C. (Edited by Pandey, G. S.) Bhavaprakasa Nighantu, Choukhamba Bharti Academy, Varanasi, p.649
19. Bhavamisra. (2015) Commentory by Chunekar, K. C. (Edited by Pandey, G. S.) Bhavaprakasa Nighantu, Choukhamba Bharti Academy, Varanasi, p.195
20. Bhavamisra. (2015) Commentory by Chunekar, K. C. (Edited by Pandey, G. S.) Bhavaprakasa Nighantu, Choukhamba Bharti Academy, Varanasi, p.42
21. Jamadagni, P. S., Jamadagni, S., Mukherjee, K., Upadhyay, S., Gaidhani, S., Hazra, J., (2016). Experimental and histopathological observation scoring methods for evaluation ofwound healing properties of Jatyadi Ghrita. Ayu, 37(3-4):222-9.
22. Shreelakshmidevi, S., Jaikumar, S., Abilash, S., Chandrakumari, Pammy, S., (2019). Effect of Azadirachta indica Crude bark Extracts Concentrations against Gram-Positive and Gram-Negative bacterial Pathogens. J. Pharm Bioallied Sci., 11(1):33-37.
23. Sujatha, R., Mariajancyrani, C., (2013). Preliminary Phytochemical Investigation and Antimicrobial Activity of Sinapis Alba. SJAMS., 1(3):138-141.
24. Goyal, P., Chauhan, A., Kaushik, P., (2010). Assessment of Commiphora wihtii, Bhandari (guggulu) as potential source for antibacterial agent. J. Med. Medical Sci., 1(3):71-75.
25. Devi, S. A., Ganjwala, D. (2009). Antimicrobial Activity of Acorus Calamus Rhizome and Leaf. Acta Biologica Szegediensis., 53(1):45-49.
26. Qureshi, I., (2015). Antimicrobial activity of *Guggul* (C. Wightii) Plant in Arid Region of Jhunjhunu. IJERMT., 2(4):37-41.
27. Winterbourn, C.C., Kettle, A.J., Hampton, M. B., (2016). Reactive Oxygen Species and Neutrophil Function. Annu Rev Biochem., 85():765-792.
28. Wilgus, T. A., Roy, S., McDaniel, J. C., (2013). Neutrophils and Wound Repair: Positive Actions and Negative Reactions. Adv Wound Care (New Rochelle)., 2(7):379-388.
29. Sushruta. (Reprint 1997). Chikitsasthana (Edited by Ambikadatta, S.) Sushrut Samhita (Vol1), Choukhamba Sanskrut Sansthan, Varanasi, p.16.