



## A COMPREHENSIVE REVIEW OF AYURVEDIC FORMULATIONS FOR VRANA ROPANA

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Article Received on  
21 June 2024,

Revised on 11 July 2024,  
Accepted on 01 July 2024

DOI: 10.20959/wjpr202415-33486



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### ABSTRACT

Ayurvedic formulations for *Vrana Ropana* offer a comprehensive and effective approach to wound healing. Their multifaceted properties, including antibacterial, anti-inflammatory, analgesic and hemostatic effects, make them suitable for managing both chronic and acute wounds. Wound healing is a type of tissue repair involving numerous processes influenced by both systemic and local factors. Systemic factors include nutrition, metabolic status, circulatory status and hormone levels. Local factors that affect wound healing include infection, mechanical factors, foreign bodies, as well as the size, location and type of wound. This review highlights the potential of *Ayurvedic* treatments in modern wound care and provides a foundation for future research and clinical practice.

**KEYWORDS:** *Vrana, Ropana, Shodhana, Formulations.*

### INTRODUCTION

In *Ayurveda*, the term "*Vrana*" is compared to what is known as a wound in modern medical terminology. In *Ayurveda*, "*Vrana*" refers to wounds or ulcers. *Ayurvedic* texts provide detailed information on the types, causes, symptoms and treatments of *Vrana*. The management of wounds in *Ayurveda* involves a holistic approach that includes internal and external treatments aimed at promoting healing, reducing pain and inflammation and preventing infection. Wound healing is a type of tissue repair involving numerous processes influenced by both systemic and local factors. Systemic factors include nutrition, metabolic status, circulatory status and hormone levels. Local factors that affect wound healing include infection, mechanical factors, foreign bodies, as well as the size, location and

type of wound.<sup>[1]</sup> When a wound does not heal properly, various complications can arise. *Acharya Sushruta* defined *Vrana* (ulcer) as a structural deformity in the skin and deeper tissues (*Vrana Gatra Vichurnane, Vranayati iti Vranaha*), characterized by symptoms like *ruja* (pain) and *srava* (discharge). *Vranas* can be caused either by the vitiation of the *doshas* (humors of the body) or by trauma.<sup>[2]</sup> For *Vrana Ropana* (wound healing), *Ayurveda*, offers several formulations and treatments.<sup>[3]</sup>

This review highlights the potential of *Ayurvedic* treatments in modern wound care and provides a foundation for future research and clinical practice. The objective of this study is to provide a comprehensive review of *Ayurvedic* formulations commonly used for *Vrana Ropana*.

**Types of *Vrana*:** *Acharya Sushruta*, regarded as the father of surgery in *Ayurveda*, provided a detailed classification and description of *Vrana* (wounds) in his texts. According to him, *Vrana* can be classified based on various factors including their causes, nature and prognosis. Here is an overview of *Vrana* according to *Acharya Sushruta*:

Based on etiology *Vranas* are mainly of two types: *NijaVrana* and *Aganthuja Vrana*

Based on clinical features: *Dushta*, *Shuddha*, *Ruhyamana*, *Rudha Vrana*

Based on prognosis: *Sukha Sadhya*, *Kashta Sadhya*, *Yapya*, *Asadhya*.

Based on sites: *Twak* (skin), *Mamasa* (muscles), *Sira* (veins), *Snayu* (ligaments), *Asthi* (bones), *Marma* (vital points), *Sandhi* (Joints) *Koshta* (space or hollowness of the body for accommodation of organs)

### **Ayurvedic Perspective on *NijaVrana* and *Aganthuja Vranas***

In *Ayurveda*, the concept of *Doshas* (*Vata*, *Pitta* and *Kapha*)<sup>[3]</sup> plays a significant role in the development of *Vrana*. Imbalance in these *Doshas* can lead to various types of wounds and ulcers.

In *Nija Vrana*, the *tridoshas* by their particular etiological factors get deranged and gets lodged in the *Vrana adhishtana* (site of wound) and produces *Vrana*. These are further classified as:

- 1) *Vataja Vrana*: Wounds caused by *Vata* imbalance are characterized by dryness, roughness and severe pain.
- 2) *Pittaja Vrana*: Wounds caused by *Pitta* imbalance are marked by redness, inflammation, burning sensation and discharge.

- 3) *Kaphaja Vrana*: Wounds caused by *Kapha* imbalance are typically swollen, pale and slow to heal with heavy discharge.
- 4) *Sannipataja Vrana*: Wounds caused by a combined imbalance of all three *Doshas*, exhibiting mixed characteristics.

*Aganthuja Vranas*<sup>[4]</sup> are caused by direct external injuries to the body. The local structures, such as *twak* (skin), *mamasa* (muscles), *sira* (veins), *snayu* (ligaments), *asthi* (bones) and *marma* (vital points), *Sandhi* (Joints) *Koshta* (space or hollowness of the body for accommodation of organs) are disrupted according to the etiological factors, producing *sadyo Vranas* (acute wounds) or *Aganthuja Vranas* (traumatic wounds). Initially, structural derangement occurs, followed by the vitiation of *doshas*. If not treated at this stage, within seven days, the wound can progress into *Dushta Vrana* (chronic or infected wound). These wounds are typically open and require immediate attention to prevent infection and promote healing. Various types of *Aganthuja Vranas* are:

*Chinna Vrana* - Clean cut wounds caused by sharp objects such as knives, blades, or surgical instruments.

*Bhinna Vrana* - Wounds caused by sharp objects that penetrate the body, such as needles, nails, or arrows.

*Viddha Vrana* - Similar to *Bhinna Vrana*, these are caused by pointed objects like thorns, splinters, or animal bites.

*Kshata Vrana* - Wounds with irregular, torn edges caused by blunt trauma, machinery, or accidents.

*Picchita Vrana* - Wounds caused by heavy objects crushing or compressing the body.

*Ghrishta Vrana* - Wounds resulting from blunt force trauma that does not break the skin but causes underlying tissue damage.

### Classification on the basis of clinical features

- 1) ***Dushta Vrana*** (Chronic Wounds):<sup>[5]</sup> These are non-healing or infected wounds that may result from untreated acute wounds or underlying health conditions. *Dushta Vrana* refers to a wound or ulcer that has become infected or aggravated due to various factors such as poor hygiene, improper care, or systemic imbalances. These wounds are typically characterized by increased pain, inflammation, discharge and a prolonged healing process. Proper management and treatment are crucial to prevent complications and promote healing.

### Causes of *Dushta Vrana*

1. Poor Hygiene: Lack of cleanliness can lead to the accumulation of dirt and bacteria, causing infection.
2. Improper Wound Care: Inadequate or incorrect wound management can exacerbate the condition.
3. Contaminated Environment: Exposure to a contaminated environment can introduce pathogens into the wound.
4. Systemic Imbalances: Imbalances in the *Doshas* (*Vata*, *Pitta*, *Kapha*) can lead to a deterioration of the wound.
5. Underlying Health Conditions: Conditions like diabetes, poor circulation, or immune deficiencies can contribute to wound complications.
6. Inadequate Nutrition: Poor nutrition can impair the body's ability to heal wounds effectively.<sup>[6]</sup>

Management of *Dushta Vrana* focuses on thorough cleansing (*Shodhana*) to remove contaminants and necrotic tissue followed by appropriate *Ropana* (healing) measures to combat infection, promote tissue regeneration and support wound closure. *Bandhana* (Bandaging) is vital to prevent further contamination and facilitate optimal healing conditions.<sup>[7]</sup>

### 2) *Shuddha Vrana*

*Shuddha Vrana* refers to a clean wound in *Ayurveda*. It is characterized by the absence of infection, healthy granulation tissue and a lack of foul smell or discharge. The wound shows signs of proper healing, with reduced inflammation and pain and the surrounding tissue appears healthy. Effective management of *Shuddha Vrana* focuses on further promoting healing and preventing any infection.<sup>[8]</sup>

### 3) *Ruhyamana Vrana*

*Ruhyamana Vrana* refers to a healing wound in *Ayurveda*. It is characterized by the formation of healthy granulation tissue, reduction in wound size and absence of significant discharge or infection. The wound edges are closing and there is minimal pain and inflammation. Management of *Ruhyamana Vrana* focuses on supporting the natural healing process, ensuring proper wound care and preventing any potential complications.<sup>[9]</sup>

#### 4) *Rudha Vrana*

*Rudha Vrana* refers to a healed wound in *Ayurveda*. It is characterized by complete closure of the wound, restoration of skin integrity and absence of any signs of infection or discharge. The wound site has returned to its normal state, with healthy, intact skin and no remaining pain or inflammation. Management of *Rudha Vrana* involves monitoring to ensure the wound remains healed and taking measures to prevent recurrence or complications.<sup>[10]</sup>

### Classification of Vrana Based on Prognosis

#### 1) *Sukha Sadhya Vrana*

*Sukha Sadhya Vrana* refers to an easily treatable wound in *Ayurveda*. It is characterized by favorable conditions for healing, such as minimal infection, healthy surrounding tissue and good overall health of the patient. These wounds typically respond well to standard Ayurvedic treatments and heal relatively quickly without complications. Management of *Sukha Sadhya Vrana* involves applying appropriate wound care techniques and Ayurvedic formulations to promote rapid healing and prevent any potential issues.<sup>[11]</sup>

#### 2) *Kashta Sadhya Vrana*

*Kashta Sadhya Vrana* refers to a difficult-to-treat wound in *Ayurveda*. These wounds are characterized by challenging conditions for healing, such as severe infection, extensive tissue damage, poor blood supply, or underlying health issues that complicate recovery. Such wounds often require more intensive and prolonged treatment and there is a higher risk of complications. Management of *Kashta Sadhya Vrana* involves comprehensive and aggressive wound care, utilizing both systemic and local Ayurvedic therapies to address the underlying issues and support the healing process.<sup>[12]</sup>

#### 3) *Yapya Vrana*

*Yapya Vrana* refers to a wound that can be managed and controlled but not completely cured. These wounds often result from chronic conditions or underlying diseases that hinder full recovery. The goal of treatment for *Yapya Vrana* is to maintain the wound in a stable condition, prevent worsening and manage symptoms to improve the patient's quality of life. Management involves regular and consistent wound care, using Ayurvedic formulations and therapies to keep the wound clean, reduce inflammation and promote as much healing as possible while managing the underlying conditions contributing to the chronic nature of the wound.<sup>[13]</sup>

#### 4) *Asadhya Vrana*

*Asadhya Vrana* refers to incurable wounds in *Ayurveda*. These wounds are characterized by conditions that make complete healing impossible, often due to severe underlying health issues, extensive tissue damage, or chronic diseases that significantly impair the body's ability to heal. Management of *Asadhya Vrana* focuses on palliative care to relieve symptoms, prevent further deterioration, and improve the patient's quality of life as much as possible.<sup>[14]</sup>

#### Principles of *Vrana Ropana*

In the management of *Vrana* (wounds), *Chikitsa Sutra* (treatment principles) need to consider both the overall involvement of the body and the locally affected tissue.<sup>[15]</sup> Various conditions and types of wounds can influence whether healing occurs quickly, is delayed, or becomes incurable. The principles of *Vrana Ropana* (wound healing) in *Ayurveda* are rooted in holistic approaches that aim to promote natural healing, prevent infection and restore tissue integrity. *Acharya Charak* has told thirty types of procedures, *Acharya Bhela* has talked about ten procedures, *Acharya Vagbhatta* talked about twenty six procedures, *Acharya Kasyapa* talked about eleven procedures and in *Bhavprakash* ten different procedures have been told.

Besides this, the concept of *Shashti Upakrama* which refers to the sixty procedures or treatments described particularly in the context of wound management and surgical procedures. These principles are outlined in the *Sushruta Samhita*, which focuses on surgery and wound care. The sixty procedures are grouped into various categories, each addressing different aspects of wound care and healing.<sup>[16]</sup>

#### Key principles of *Vrana Ropana*

- *Shodhana* refers to the process of purification or cleansing. It involves the debridement or removal of necrotic (dead) tissue, foreign bodies and contaminants from the wound to prevent infection, promote healthy tissue regeneration and facilitate the healing process. By utilizing a combination of mechanical, chemical and autolytic methods, along with the application of antiseptic and healing herbs, *Ayurveda* provides a comprehensive approach to wound management. This can be done using antiseptic herbal decoctions such as those made from *Neem* (*Azadirachta indica*), *Triphala* (a combination of three fruits: *Haritaki*, *Bibhitaki*, and *Amalaki*), or *Turmeric* (*Curcuma longa*), *Manjistha* (*Rubia cordifolia*), *Amla* (*Emblica officinalis*) and *Guduchi* (*Tinospora cordifolia*). Using these traditional



methods, one can leverage the healing power of nature while adhering to the principles of *Ayurveda*.<sup>[17]</sup>

- *Ropana* (Healing): This step focuses on encouraging the growth of new tissue, reducing inflammation and preventing infection. To promote healing and reduce inflammation commonly used herbal formulations include: *Jatyadi taila*, *Neem*, *Gghrita* and *Madhu*.<sup>[18]</sup>
- *Lepana* (Application of Pastes): Applying herbal pastes can help reduce pain, swelling and inflammation. Turmeric and Sandalwood paste or a mixture of *Ghee* (clarified butter) and honey are commonly used.<sup>[19]</sup>
- *Bandhana* (Bandaging): The wound is then covered with a sterile bandage to protect it from further injury and infection. The dressing should be changed regularly to keep the wound clean and dry.<sup>[20]</sup>

## RELATED WORKS

Research has explored the efficacy of traditional Ayurvedic formulations like *Jatyadi Ghrita*, *Panchavalkala* and *Yashada Bhasma* in promoting wound healing and reducing microbial load. Some studies have investigated the effects of specific herbs and formulations mentioned in Ayurvedic texts on wound contraction, epithelialization and collagen synthesis. In a case study of venous ulcer, aged about 30 years old patient treated with *Jatyadi Tail*, in the form of *Vrana Basti* and complete healing of the ulcer was reported after 30 days of treatment.<sup>[21]</sup> Ayurvedic treatment modalities are effective in managing *Dushta Vrana*.

A study was conducted involving 30 patients with *Sadhyo Vrana*, who were treated with the local application of *Durvadi Taila*. The therapy resulted in significant relief across various clinical parameters. *Durvadi Taila* was found to be safe and effective in managing *Sadhyo Vrana* due to its antibacterial, analgesic and hemostatic properties.<sup>[22]</sup>

According to *Acharya Sushruta*, among the 60 measures of comprehensive wound management, *Kalka* (paste) is recommended for chronic wounds that are full of slough, deep-seated in muscle and resistant to healing. The paste serves both *Shodhana* (cleansing) and *Ropana* (healing) functions in cases of *Dushta Vrana*. A 38-year-old non-diabetic, non-hypertensive female sought Ayurvedic treatment for a wound on her left leg that had not responded to conventional medicines after 7 months of treatment. The ulcer was painful and foul-smelling, significantly disturbing her sleep and restricting her daily activities. Her Ayurvedic treatment included oral administration of *Patoladi Kashaya*, *Kaishora Guggulu*, *Guduchyadi Kashaya*, *Manjishtadi Kashaya* and *Avipathi Churna*, along with external

applications of *Vrana Prakshalana* (wound cleaning) and *Vrana Lepa* (medicinal paste). The Ayurvedic treatment effectively healed the *Dushta Vrana* completely in this case, demonstrating the efficacy of Ayurveda in managing chronic ulcers.<sup>[23]</sup>

However, applying the principles of *Agad Tantra* (toxicology) in the management of chronic ulcers also proves to be effective. The chronic nature of *Vrana* presents treatment challenges. Extracts of *Katupila* leaves exhibit broad-spectrum antimicrobial activity, which is crucial for wound healing by controlling and reducing microbial load. In case of a non-healing infected wound, *Muell* paste mixed with *sesame* oil was found to be very effective and demonstrated excellent healing effects in a case of chronic, non-healing wounds.<sup>[24]</sup>

Comparative studies have been conducted to evaluate the efficacy of Ayurvedic treatments versus conventional methods in managing chronic wounds, diabetic ulcers and other complex conditions. *Jatyadi Taila* and *Jatyadi Ghrita* were used to convert *Dushta Vrana* to *Suddha Vrana*. The *suddha Vrana* focuses on promoting tissue regeneration, reducing inflammation and ensuring complete recovery. Sixty patients in the age group of 20-60 were randomly selected to evaluate the efficacy of both these formulations. The patients were divided into two groups A and B. Group A was treated with *Jatyadi Taila* while group B was treated with *Jatyadi Ghrita*. It was found that *Jatyadi tail* was more effective as compared to *Jatyadi Ghrita*.<sup>[25]</sup>

In another study, *Yashada Bhasma Lepa* and *Jatyadi Ghrita* were applied in the management of *Dushta Vrana*. Thirty clinically diagnosed patients with *Dushta Vrana* were randomly divided into two groups, each consisting of 15 patients. The first group (Group A) was treated with *Yashada Bhasma Lepa*, while the second group (Group B) received *Jatyadi Ghrita* for 21 days. Based on assessment criteria and overall treatment outcomes, the patients in the *Yashada Bhasma Lepa* group showed better relief compared to those treated with *Jatyadi Ghrita*. *Yashada Bhasma Lepa*, characterized by its *Tikta* (bitter), *Kashaya* (astringent) and *Katu* (pungent) properties, effectively balances *Kapha* and *Pitta doshas*. It is also beneficial for conditions such as wound discharge (*Vranasrava Avarodaka*), as well as diabetes (*Prameha*) and wound contraction (*Sankochakara*). These properties contribute to its effectiveness in both *Shodhana* (cleansing) and *Ropana* (healing) of wounds.<sup>[26]</sup>

It is important to find a single, simple composition that possesses both *Shodhana* (cleansing) and *Vrana Ropana* (healing) properties. Forty patients with chronic wounds (wounds more



than 3 weeks old) were selected from the outpatient and inpatient departments of *Shalya Tantra* at the National Institute of Ayurveda, Jaipur. The patients were divided into two groups: Group A (*Karanjadhya Ghrita* dressing) and Group B (Hydrogen peroxide and EUSOL with a dry gauze bandage). The treatments were applied topically, and patients were monitored daily for 30 days. It was concluded that the drug “*Karanjadhya Ghrita*” has significant efficacy in both *Vrana Shodhana* (cleansing) and *Vrana Ropana* (healing) without causing any adverse effects. It was also found that the drug also increases the rate of wound contraction, promotes healthier granulation tissue and accelerates healing time.<sup>[27]</sup>

## CONCLUSION

Ayurvedic formulations for *Vrana Ropana* offer a holistic approach to wound healing, addressing both the symptoms and underlying causes of wounds. These formulations leverage the synergistic effects of medicinal herbs, minerals and ghee to promote natural healing processes, reduce inflammation, prevent infections, and support tissue regeneration. While traditional knowledge forms the basis of these formulations, ongoing research and clinical studies continue to validate their effectiveness and expand their applications in modern healthcare settings. Integrating Ayurvedic principles with evidence-based practices can enhance wound care management and improve patient outcomes, providing a valuable option for holistic healthcare.

In the era of globalization and evidence-based medicine, systematically documenting and compiling studies from different parts of the country will benefit researchers by providing a basis for further critical analysis and the design of new studies. This review suggests that wound healing using Ayurvedic drugs and procedures is safe in various dosage forms. Additionally, this systematic review establishes a solid foundation for future researchers and Ayurvedic practitioners, making unpublished trials on Ayurvedic wound healing treatments more accessible.

## CHALLENGES AND FUTURE DIRECTIONS

1. Standardization: Ensuring the quality and consistency of herbal formulations used in wound care remains a challenge, necessitating standardized protocols and quality control measures.
2. Integration with Modern Medicine: Exploring integrative approaches that combine Ayurvedic principles with modern wound care practices to optimize patient outcomes and reduce healthcare costs.

3. Clinical Evidence: Further well-designed clinical trials are needed to establish the safety, efficacy, and comparative effectiveness of Ayurvedic interventions in wound management.

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