

Review Article

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“VRANA ROPANA HERBS AND FORMULATIONS IN CHRONIC WOUND HEALING: CLASSICAL PRINCIPLES AND MODERN EVIDENCE”**Dr. Jalpa Gandhi¹****AFFILIATIONS:**

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ABSTRACT

Background: Chronic wounds, including venous, diabetic and pressure ulcers, are a growing burden on health systems. Sushruta described a comprehensive system of wound management (Vrana Chikitsa), including 60 therapeutic measures (Shashti Upakrama) and numerous herbs and formulations for cleansing (Shodhana) and healing (Ropana) of wounds. **Objective:** To review the classical principles of Vrana Chikitsa and the experimental and clinical evidence for commonly used Vrana Ropana agents, including honey, ghee, turmeric, Aloe vera, Centella asiatica, Jatyadi Taila and Panchavalkala. **Methods:** Narrative review of Sushruta Samhita and of Cochrane reviews, clinical trials, experimental studies and reviews on wound healing. **Results:** Sushruta classifies wounds by cause, Dosha, appearance and stage, and prescribes a sequence of measures from management of inflammation to cleansing, healing and restoration of normal skin colour. A Cochrane review found high-quality evidence that honey heals partial-thickness burns faster than conventional dressings, and moderate-quality evidence for infected postoperative wounds, but unclear effects in venous and diabetic ulcers. Aloe vera has limited clinical evidence. Curcumin and Centella asiatica promote wound healing in experimental studies through anti-inflammatory, antioxidant and collagen-stimulating effects. Jatyadi Taila improved wound strength and collagen deposition in normal and steroid-suppressed healing in rats. Panchavalkala decoction showed antibacterial activity against common wound pathogens. **Conclusion:** Classical Vrana Chikitsa principles align closely with modern wound bed preparation. Several Vrana Ropana agents have experimental support and honey has clinical evidence in specific wounds. Rigorous clinical trials of classical formulations in chronic ulcers are needed. **KEYWORDS:** Vrana; Vrana Ropana; wound healing; chronic ulcer; honey; Jatyadi Taila; Panchavalkala; Sushruta; Shashti Upakrama

INTRODUCTION

Chronic wounds fail to progress through the normal stages of healing in an orderly and timely manner. They include venous leg ulcers, diabetic foot ulcers, pressure ulcers and non-healing surgical wounds. Their prevalence is rising with ageing populations and diabetes, and they impose large costs on patients and health systems^[1]. Healing is impaired by factors such as ischaemia, infection, biofilm, repeated trauma, nutritional deficiency, diabetes, ageing and medications such as corticosteroids^[2,3].

Modern wound care follows the principles of wound bed preparation: removal of non-viable tissue, control of infection and inflammation, moisture balance and stimulation of the wound edge, summarised in frameworks such as TIME (Tissue, Infection/Inflammation, Moisture, Edge)^[4]. Advanced dressings and therapies have improved care, but many wounds remain unhealed for months. Sushruta's Vrana Chikitsa is one of the oldest comprehensive systems of wound management. Its classification of wounds, emphasis on cleansing before healing and use of herbs, honey and ghee are strikingly modern. This review summarises the classical principles and the evidence for commonly used Vrana Ropana agents.

METHODS

Classical sources were Sushruta Samhita, Sutra Sthana 21 to 23 and Chikitsa Sthana 1^[5]. Modern literature was identified through PubMed, the Cochrane Library and Google Scholar using wound healing, chronic ulcer, honey, Aloe vera, turmeric, curcumin, Centella asiatica, Jatyadi, Panchavalkala and Vrana Ropana. This is a narrative review.

CLASSICAL PRINCIPLES OF VRANA CHIKITSA

Classification of wounds

Sushruta classifies wounds as Nija (arising from internal Dosha imbalance) and Agantuja (traumatic)^[5]. He describes the features of wounds according to Dosha, the six stages of inflammation and healing (Shatkriyakala of Vrana), and distinguishes Dushta Vrana (contaminated, non-healing wound), Shuddha Vrana (clean wound) and Ruhyamana Vrana (healing wound). Features of Dushta Vrana include foul smell, abnormal colour, excessive discharge, severe pain, slough and slow healing, which correspond closely to the features of infected or chronic wounds.

Shashti Upakrama

Sushruta lists 60 measures for treating wounds^[5]. They can be grouped by purpose:

Table 1: Shashti Upakrama: stages of wound management and modern parallels

Stage and purpose	Examples of measures	Modern parallel
Prevention and management of inflammation	Apatarpana (fasting), Alepa (topical paste), Parisheka (irrigation), Abhyanga, Sweda	Anti-inflammatory measures, elevation, irrigation
Drainage and surgical management	Vimlapana (massage), Upanaha (poultice), Pachana (ripening), Visravana (drainage), the eight surgical procedures	Incision and drainage, debridement
Cleansing	Shodhana with Kashaya (decoctions), Varti (wicks), Kalka (pastes), Taila, Ghrita, Rasakriya	Wound cleansing, antimicrobial dressings
Healing	Ropana with Kalka, Taila, Ghrita, Churna, honey	Moist wound healing, growth-promoting dressings
Restoration of skin	Utsadana (raising depressed scars), Avasadana (lowering raised granulations), Krishna Karma and Pandu Karma (restoring colour), Romasanjanana (hair regrowth)	Scar management, pigment restoration
General measures	Diet, Rakshavidhana (protection from infection), Bandha (bandaging)	Nutrition, infection control, compression

The distinction between Shodhana (cleansing) and Ropana (healing) is central: a wound must be cleaned before healing agents are applied. This corresponds directly to modern wound bed preparation.

Common Vrana Ropana agents

- **Madhu (honey) and Ghrita (ghee):** among the most frequently recommended healing applications.
- **Haridra (turmeric):** antiseptic and healing.
- **Kumari (Aloe vera):** cooling and healing.
- **Mandukaparni (Centella asiatica):** healing and skin restoration.
- **Jatyadi Taila and Jatyadi Ghrita:** classical formulations based on Jati (Jasminum), Nimba, Patola, Haridra, Daruharidra, Manjishta, Madhuka and other herbs, widely used for chronic and infected wounds.
- **Panchavalkala:** the barks of five Ficus and related trees (Nyagrodha, Udumbara, Ashvattha, Parisha and Plaksha), used as decoction for wound washing and as powder or paste.

MODERN EVIDENCE FOR VRANA ROPANA AGENTS

Honey

Honey is the best-studied classical wound agent. Its antibacterial activity is attributed to high osmolarity, acidity, hydrogen peroxide production and other components^[6]. A Cochrane review including 26 trials with 3,011 participants found high-quality evidence that honey heals partial-thickness burns about four to five days faster than conventional dressings, and moderate-quality evidence that it heals infected postoperative wounds faster than antiseptic washes with gauze^[7]. Evidence for venous leg ulcers and diabetic foot ulcers was unclear. The review concluded that differences in wound types and comparators made overall conclusions difficult and that much of the evidence was of low quality.

Aloe vera

A Cochrane review of Aloe vera for acute and chronic wounds found only a small number of trials of limited quality and was unable to draw firm conclusions about its effects on healing^[8]. Experimental studies suggest anti-inflammatory and moisturising effects.

Turmeric and curcumin

Curcumin, the main polyphenol of turmeric, has anti-inflammatory, antioxidant and antimicrobial properties. Reviews of experimental studies report that curcumin enhances wound healing by modulating the inflammatory phase, promoting granulation tissue formation, collagen deposition and wound contraction^[9]. Clinical trials in chronic wounds are limited, and its poor water solubility has led to the development of nano-formulations and dressings.

Centella asiatica

Centella asiatica contains triterpenes such as asiaticoside and madecassoside, which stimulate collagen synthesis and fibroblast proliferation. Reviews of its dermatological uses report evidence of wound-healing and scar-modulating effects in experimental and some clinical studies^[10].

Jatyadi Taila

In a rat study of incision and excision wounds, topical Jatyadi Taila increased wound breaking strength compared with controls and improved healing in wounds suppressed by dexamethasone, with increased hydroxyproline (a marker of collagen), dense collagen deposition and higher fibroblast counts^[11]. This is relevant because corticosteroid-impaired healing is a recognised clinical problem. Clinical trials comparing Jatyadi Taila or Ghrita with standard dressings in chronic ulcers are needed.

Panchavalkala

In a laboratory study, Panchavalkala decoction produced zones of inhibition against Escherichia coli and Staphylococcus aureus comparable to those of ciprofloxacin, whereas the distilled preparation (Arka) showed no activity^[12]. The tannin-rich barks are astringent, which may explain their traditional use to reduce discharge and promote cleansing. This supports the classical use of Panchavalkala decoction for washing infected wounds, although clinical trials are needed.

GHEE, OILS AND BANDAGIN

Ghee and medicated oils are central to Ayurvedic wound care. They keep the wound bed moist, soften slough and protect new tissue, consistent with the modern principle that a moist environment favours epithelialisation. Lipid vehicles also allow fat-soluble constituents of herbs to remain in contact with the wound. Ghee processed with healing herbs, such as Jatyadi Ghrita, is preferred for wounds with burning and heat (Pitta), whereas oils are preferred for dry.

Table 2: Summary of evidence for Vrana Ropana agents

Agent	Evidence	Main finding	Certainly (authors' judgement)
Honey	Cochrane review ^[7]	Faster healing of partial-thickness burns and infected postoperative wounds.	Moderate to high (specific wounds)
Aloe vera	Cochrane review ^[8]	Insufficient evidence	Low
Turmeric / curcumin	Reviews of experimental studies ^[9]	Anti-inflammatory, pro-healing effects	Low (clinical)
Centella asiatica	Review ^[10]	Collagen stimulation; wound and scar effects	Low to moderate
Jatyadi Taila	Rat study ^[11]	Improved strength and collagen in normal and steroid-suppressed wounds	Very low (clinical)
Panchavalkala	In vitro study ^[12]	Antibacterial activity against E. coli and S. aureus	Very low (clinical)

Bandha (bandaging)

Sushruta describes 14 types of bandages and three degrees of tightness (Gadha, Sama and Shithila), chosen according to the site and the Dosha of the wound^[5]. He notes that a properly applied bandage protects the wound, holds medicines in place, controls bleeding and swelling, and aids healing. This attention to bandaging technique and tightness anticipates modern compression bandaging for venous ulcers, where the correct pressure is critical to healing.

DIET AND SYSTEMIC FACTORS

Sushruta advises a light, nourishing and wholesome diet for wound patients and warns against foods that aggravate inflammation or are hard to digest, as well as against daytime sleep, exertion and sexual activity during healing^[5]. He also emphasises protection of the patient from contamination (Rakshavidhana) by fumigation and cleanliness.

Modern evidence confirms that nutrition strongly influences healing. Adequate energy and protein, and sufficient vitamins and trace elements such as vitamin C and zinc, are needed for collagen synthesis and immune function, and malnutrition delays healing^[13]. Ayurvedic attention to Agni and diet can therefore support wound care, provided it does not lead to excessive dietary restriction in malnourished patients, who often need more protein rather than less.

CHRONIC WOUNDS: BIOLOGICAL**BARRIERS AND CLASSICAL CONCEPTS**

Modern research shows that chronic wounds are characterised by persistent inflammation, high protease activity, senescent cells and bacterial biofilms that prevent progression to healing^[3,14,15]. Biofilms in particular protect bacteria from antibiotics and host immunity and sustain inflammation^[15].

These findings correspond closely to Sushruta's Dushta Vrana: a wound with slough, foul smell, discharge and failure to heal. Sushruta's insistence on thorough cleansing with astringent decoctions, wicks and pastes before applying healing agents parallels modern emphasis on debridement and biofilm disruption. Tannin-rich decoctions such as Panchavalkala and antimicrobial agents such as honey and turmeric may contribute to this phase.

INTEGRATING VRANA CHIKITSA WITH MODERN WOUND CARE

An integrated approach to chronic wounds in an Ayurveda surgical setting could include:

1. **Assessment:** wound history, measurement and photography; vascular assessment; screening for diabetes, infection and nutritional deficiency.
2. **Treatment of the cause:** compression for venous ulcers, offloading for diabetic foot ulcers, pressure relief for pressure ulcers, glycaemic control.
3. **Cleansing (Shodhana):** sharp or mechanical debridement where needed; irrigation with Panchavalkala or Triphala decoction; antimicrobial applications such as honey.

4. **Healing (Ropana):** honey, Jatyadi Taila or Ghrita, or Centella-based preparations once the wound bed is clean; moisture balance with appropriate dressings.
5. **General measures:** nutrition, management of Agni, rest and protection.
6. **Monitoring:** regular measurement of wound area to track healing rate and change treatment if the wound is not improving.

This approach combines the strengths of both systems and allows Ayurvedic formulations to be evaluated within standard wound care.

SAFETY AND QUALITY

Topical herbal preparations can cause contact dermatitis or allergic reactions. Honey should be medical-grade and sterile to avoid contamination with spores. Oils and ghee should be prepared hygienically and stored properly. Wounds that show spreading infection, systemic signs or ischaemia need urgent medical care. In diabetic foot ulcers, delays in offloading, revascularisation or surgical debridement can lead to amputation, so Ayurvedic topical agents should complement rather than replace these measures.

DISCUSSION

Sushruta's system of wound care, with its classification of wounds, stages of healing, emphasis on cleansing before healing and comprehensive list of interventions, anticipates many principles of modern wound care. Honey, one of his most important wound agents, now has clinical evidence in specific wound types. Several classical herbs have experimental support.

However, most classical formulations, including Jatyadi Taila and Panchavalkala, have not been tested in well-designed clinical trials in chronic ulcers. Such trials should use standard outcomes such as complete healing, time to healing and percentage area reduction, with standard care in both arms.

CONCLUSION

Vrana Chikitsa offers a comprehensive and remarkably modern framework for wound management. Honey has clinical evidence for burns and infected wounds, and turmeric, Centella, Jatyadi Taila and Panchavalkala have experimental support. Rigorous clinical trials of classical Vrana Ropana formulations in chronic ulcers, integrated with

standard wound care, are needed.

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