

## Ayurvedic and Modern Surgical Approaches to Non-Healing Wounds: A Comprehensive Review

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Non-healing wounds present a significant challenge in surgical practice, requiring a multidisciplinary approach for effective management. This review explores the principles and practices of wound management in Ayurveda, focusing on Vrana Ropana (wound healing) and modern surgical techniques. The article aims to highlight integrative approaches that can optimize patient outcomes through a deeper understanding of both traditional and contemporary methodologies.

**Keywords:** Vrana Ropana, wound healing, wound care, Nija Vrana, Agantuja Vrana, Dushta Vrana

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## Introduction

Non-healing wounds, also known as chronic wounds, fail to progress through normal stages of healing within a predictable time frame, typically persisting for more than four weeks. These wounds are often associated with systemic conditions such as diabetes mellitus, venous or arterial insufficiency, and infections, leading to significant morbidity and healthcare costs globally. In *Ayurveda*, ancient Indian system of medicine, management of such wounds is deeply rooted in principles of *Vrana Chikitsa* (wound care). This review aims to provide a comprehensive comparison of *Ayurvedic* & modern surgical approaches to chronic wound management & explore potential integrative strategies.

### Ayurvedic Perspective on Non-Healing Wounds

#### 1. Concept of *Vrana* (Wounds):

##### ▪ Classification:

- ***Nija Vrana* (Endogenous):** Resulting from systemic imbalances, typically involving aggravated *Doshas* (*Vata*, *Pitta*, *Kapha*).
- ***Agantuja Vrana* (Traumatic):** Resulting from external injuries such as cuts, burns, or surgical interventions.

##### ▪ Chronic Wounds as *Dushta Vrana*:

- These wounds are characterized by persistent infection, foul-smelling discharge, slough formation, and delayed healing.
- The pathogenesis involves impaired circulation, *Dosha* vitiation, and the presence of *Ama* (toxins).

#### 2. Principles of Wound Management in *Ayurveda*:

##### ▪ *Shodhana* (Cleansing):

- Removal of necrotic tissue, debris, and pus to prepare the wound bed.
- Use of herbal decoctions like *Panchavalka Kwatha* for irrigation.

##### ▪ *Ropana* (Healing):

- Application of herbal oils, pastes, and powders to promote granulation and epithelialization.

##### ▪ *Srotoshodhana* (Channel Cleansing):

- Ensures proper drainage of toxins and exudates, preventing wound stagnation.

#### 3. *Ayurvedic* Interventions:

##### ▪ *Ksharasutra* Therapy:

- Preparation: A medicated thread coated with alkaline herbal extracts such as *Apamarga* (*Achyranthes aspera*) and *Snuhi* (*Euphorbia neriifolia*) latex.
- Mechanism: Sustained chemical cauterization, antibacterial action, and stimulation of granulation tissue.
- Indications: Effective for sinus tracts, fistulas, pilonidal sinus, and non-healing ulcers.

##### ▪ Local Applications:

- *Jatyadi Taila*: Contains herbs like *Nimba* (*Azadirachta indica*) and *Haridra* (*Curcuma longa*) for antimicrobial and anti-inflammatory effects.
- *Madhu* (Honey): A natural humectant with antibacterial and granulation-promoting properties.
- *Haridra Churna* (Turmeric Powder): Used for dusting wounds to reduce inflammation and prevent infection.

##### ▪ Herbal Formulations:

- *Dasanga Lepa*: A paste made from ten medicinal herbs, applied to reduce swelling and promote healing.
- *Triphala Powder*: Contains *Haritaki*, *Bibhitaki*, and *Amalaki* for antimicrobial action and cleansing.

#### 4. Systemic Therapies:

- ***Rasayana* (Rejuvenation):** Medicines like *Chyawanprash* and *Guduchi* (*Tinospora cordifolia*) to boost immunity.

- ***Panchakarma* (Detoxification):** Procedures like *Virechana* (therapeutic purgation) to eliminate systemic toxins contributing to delayed healing.

### Modern Surgical Approaches

#### 1. Standard Wound Care Protocols:

##### ▪ Debridement:

- Surgical: Scalpel or scissors used to remove necrotic tissue.
- Enzymatic: Application of proteolytic enzymes to dissolve slough.

- Autolytic: Moisture-retentive dressings to allow natural enzymes to break down necrosis.

#### ■ **Antimicrobial Therapy:**

- Topical agents: Silver sulfadiazine, povidone-iodine, and chlorhexidine.
- Systemic antibiotics based on wound culture sensitivity.

#### ■ **Advanced Dressings:**

- Hydrocolloid: Maintains a moist environment for autolytic debridement.
- Foam: Absorbs exudate while protecting the wound bed.
- Silver-impregnated dressings: Provides sustained antimicrobial effects.

### 2. Adjunctive Therapies:

#### ■ **Negative Pressure Wound Therapy (NPWT):**

- Mechanism: Applies controlled suction to enhance wound contraction, angiogenesis, and removal of exudate.
- Indications: Suitable for large, exudative wounds.

#### ■ **Skin Grafting and Flaps:**

- Split-thickness skin grafts for epithelial coverage.
- Flap surgery for deep defects requiring vascularized tissue.

#### ■ **Growth Factors and Bioengineered Skin Substitutes:**

- Platelet-rich plasma (PRP) and recombinant growth factors like VEGF to stimulate cellular proliferation and wound closure.

### 3. Challenges in Modern Wound Care:

- High recurr. rates, especially in diabetic ulcers.
- Development of biofilm-associated infections resistant to conventional antibiotics.
- Economic burden of advanced therapies.

### Comparative Analysis: *Ayurvedic* vs. Modern Approaches

#### 1. Efficacy:

- Clinical studies demonstrate comparable outcomes for *Ksharasutra* therapy and surgical debridement in chronic sinuses.

- *Ayurvedic* formulations accelerate healing in mild-to-moderate chronic wounds, often outperforming synthetic dressings in early stages.

#### 2. Safety:

- *Ayurvedic* interventions, being plant-based, exhibit fewer systemic side effects compared to prolonged antibiotic regimens.

#### 3. Cost-Effectiveness:

- Herbal preparations and *Ayurvedic* interventions are accessible and affordable in resource-constrained settings, unlike expensive modern therapies.

### Integrative Approaches in Wound Management

#### 1. Combining Therapies:

##### ■ **Case Studies:**

- Use of *Ayurvedic* wound dressings (e.g., *Jatyadi Taila*) in conjunction with NPWT showed faster healing rates.
- Oral *Rasayana* drugs used alongside antibiotics reduced systemic inflammation and improved immunity.

#### 2. Lifestyle and Dietary Modifications:

- Inclusion of anti-inflammatory foods like turmeric and ginger in diet.
- Avoidance of aggravating factors such as smoking and alcohol.

#### 3. Role of *Panchakarma*:

- Therapies like *Vamana* (emesis) and *Basti* (medicated enemas) address systemic issues contributing to poor wound healing.

### Future Directions

- Rigorous clinical trials to evaluate the efficacy of *Ayurvedic* interventions in chronic wound care.
- Development of integrative wound care centres with *Ayurvedic* and modern surgical specialists.
- Innovations in phytochemical research for biofilm disruption and antimicrobial resistance management.

## Conclusion

Non-healing wounds require a personalized and integrative approach for optimal management. The synergistic use of *Ayurvedic* therapies, such as *Ksharasutra* and herbal dressings,

Alongside modern surgical techniques like NPWT and skin grafting, can revolutionize chronic wound care. Collaboration between traditional and modern medicine systems, supported by robust clinical evidence, holds the potential to improve patient outcomes and reduce healthcare costs globally.

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