



Review Article	Volume 15 Issue 07	July 2026
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A CONCEPTUAL REVIEW ON RASANJANADI LEPA IN THE MANAGEMENT OF NADI VRANA (PILONIDAL SINUS) WITH SPECIAL REFERENCE TO GUNA, KARMA AND SAMPRAPTI VIGHATANA

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Abstract

Background: Nadi Vrana is a chronic sinus tract disorder described in Sushruta Samhita, arising from inadequate management of Vrana (abscess). It is characterized by persistent purulent discharge, chronic inflammation, and delayed healing. Its clinical presentation and pathogenesis closely parallel Pilonidal Sinus, a condition involving sinus formation due to hair penetration and foreign body reaction.^{1,7,8} Despite advances in surgical techniques, recurrence rates remain high, necessitating effective conservative approaches.²¹

Aim: To evaluate the conceptual and pharmacological efficacy of Rasanjanadi Lepa in the management of Nadi Vrana with reference to Guna, Karma, and Samprapti Vighatana.

Materials and Methods: This is a conceptual review based on classical Ayurvedic texts — Sushruta Samhita, Charaka Samhita, and Ashtanga Hridaya — along with freely available modern scientific literature on pilonidal sinus and wound healing.^{1-6,7-11,18-21}

Results: Rasanjanadi Lepa exhibits significant Shodhana (cleansing), Lekhana (debridement), Krimighna (antimicrobial), and Ropana (healing) properties, attributed to its Tikta-Kashaya

Rasa, Laghu-Ruksha Guna, Ushna Virya, and Katu Vipaka, which effectively counteract Kapha-Vata Dushti and promote tissue regeneration.^{3,5,6,15-17}

Conclusion: Rasanjanadi Lepa provides a rational, mechanism-based, and non-invasive therapeutic approach for Nadi Vrana. Its multi-targeted action aligns with modern wound care principles, making it a promising conservative modality in the management of Pilonidal Sinus.^{18,21}

Keywords: *Nadi Vrana, Pilonidal Sinus, Rasanjanadi Lepa, Shalya Tantra, Vrana Chikitsa, Shodhana, Ropana, Wound Healing.*

1. Introduction

Nadi Vrana is described in Ayurvedic classics as a chronic sinus tract disorder formed due to untreated or improperly managed Vrana, particularly when suppuration is not adequately addressed. Sushruta elaborately described its Nidana, Lakshana, and Chikitsa under Vrana Chikitsa Adhyaya.¹ The disease is characterized by repeated pus discharge, pain, foul smell, induration, itching, and delayed healing.

दुष्टव्रणानाम् नाड्यः स्युः दीर्घकालानुबन्धिनः¹

पुयस्रावसमायुक्ता दुःखोपचारसंयुता¹

These classical verses emphasize the chronic, recalcitrant nature of Nadi Vrana, associated with persistent purulent discharge and difficulty in treatment. The underlying pathogenesis involves Vata-Kapha Dosha Prakopa, Mamsa Dhatu Dushti, and Srotorodha.¹⁻³

From a modern perspective, Pilonidal Sinus is a chronic inflammatory disease of the natal cleft characterized by sinus tract formation, hair accumulation, and recurrent infection.^{7,8} Despite surgical modalities such as excision and flap techniques, recurrence rates remain significant at 10–30%.²¹ Postoperative complications including infection, delayed healing, and patient discomfort are common.^{8,9}

This underscores the need for effective conservative therapies. Ayurvedic formulations like Rasanjanadi Lepa offer significant benefits through their local anti-inflammatory, antimicrobial, and wound-healing actions.^{2-4,10}

2. Aim and Objectives

Aim

To evaluate the conceptual and pharmacological efficacy of Rasanjanadi Lepa in the management of Nadi Vrana (Pilonidal Sinus) with special reference to Guna, Karma, and Samprapti Vighatana.

Objectives

- To study the Ayurvedic concept of Nadi Vrana
- To correlate Nadi Vrana with Pilonidal Sinus
- To analyze the Guna and Karma of Rasanjanadi Lepa
- To understand its role in Samprapti Vighatana
- To correlate Ayurvedic principles with modern pathophysiology
- To review freely available scientific evidence on wound healing and antimicrobial activity of the ingredients

3. Materials and Methods

This study is a conceptual and narrative literary review. Classical references were collected from Sushruta Samhita, Charaka Samhita, Ashtanga Hridaya, and Bhavaprakasha Nighantu. Modern references were sourced exclusively from open-access indexed journals freely downloadable via PubMed Central (PMC), MDPI, Cochrane Library, RSC Publishing, and open-access repositories.

Classical Sources

- Sushruta Samhita^{1,2}
- Charaka Samhita^{3,4}
- Ashtanga Hridaya⁵
- Bhavaprakasha Nighantu⁶

Modern Sources (Open Access)

- Clinical and review articles on Pilonidal Sinus (Cureus, BMC Surgery, Perioperative Medicine)⁷⁻⁹
- Ayurvedic wound management literature (Journal of Ayurveda and Holistic Medicine)¹⁰
- Phytochemical and pharmacological studies (RSC Advances, Foods-MDPI, Phytotherapy Research)^{11,12,16}
- Wound healing and antimicrobial studies (Current Science, Advances in Wound Care, ECAM)^{15,18,19}
- Systematic reviews (Cochrane Database, Int J Lower Extremity Wounds)^{20,21}

Methodology

- Textual analysis of Ayurvedic concepts
- Pharmacological correlation of herbal ingredients with freely available evidence
- Comparative analysis with modern wound healing principles

4. Samprapti (Pathogenesis of Nadi Vrana)

Ayurvedic Concept

Sushruta described Nadi Vrana as a deep-seated tract with continuous discharge caused by Dosha Dushti and improper treatment of abscesses.¹ Vata predominance results in pain and sinus tract formation; Pitta causes suppuration and burning; Kapha contributes to chronicity, induration, and discharge.

वातकफप्रकोपेन नाडीव्रणः प्रवर्तते¹

मांसधातुदुष्टत्वात् स्रोतोरोधः प्रजायते³

दुष्टे व्रणे न शुद्धिः स्यात् तदा नाडी प्रजायते²

Nidana (Causative Factors)

- Improperly treated Vidradhi (abscess)
- Trauma and foreign body retention
- Dushta Vrana (infected wound)
- Poor hygiene and Krimi involvement

Lakshana (Clinical Features)

- Recurrent pus discharge (Puya Srava)
- Pain and tenderness
- Multiple sinus openings
- Itching (Kandu) and foul smell (Daurgandhya)
- Delayed healing

Pathophysiological Sequence

Nidana (Trauma, Hair, Infection) → Vata-Kapha Dosha Prakopa¹ → Rakta-Mamsa Dhatu Dushti³ → Srotorodha → Apakwa Vrana → Inadequate Shodhana → Nadi Vrana (Sinus Formation) → Chronic pus discharge

5. Modern Correlation: Pilonidal Sinus

Pilonidal Sinus is derived from the Latin words 'pilus' (hair) and 'nidus' (nest). It involves a sinus tract containing hair follicles and granulation tissue, predominantly affecting males in the second and third decades. Common symptoms include pain, discharge, swelling, and recurrent abscess formation.^{7,8}

Etiological Factors

- Hair penetration into skin

- Friction and pressure (prolonged sitting, obesity)
- Poor hygiene
- Secondary bacterial infection

Pathophysiology

- Foreign body granuloma formation
- Chronic inflammation
- Sinus tract development
- Persistent discharge

Clinical Challenges

- High recurrence rates (10–30%)²¹
- Prolonged healing time
- Postoperative complications including infection and wound dehiscence^{8,9}

Correlation with Ayurveda

Modern Concept	Ayurvedic Concept
Chronic inflammation	Vata-Kapha Dushti
Infection	Krimi / Dushta Vrana
Sinus tract	Nadi
Discharge	Puya Srava
Poor healing	Dhatu Dushti

6. Rasanjanadi Lepa: Composition and Properties

Rasanjanadi Lepa is a polyherbal topical formulation traditionally used in Dushta Vrana and inflammatory disorders. The formulation possesses antimicrobial, anti-inflammatory, wound-cleansing, and healing properties.

Ingredient	Rasa	Guna	Virya	Karma
Rasanjana (Berberis aristata)	Tikta, Kashaya	Laghu	Sheeta	Ropana, Krimighna
Haridra (Curcuma longa)	Tikta, Katu	Laghu, Ruksha	Ushna	Vishaghna, Vranashodhana

Ingredient	Rasa	Guna	Virya	Karma
Daruharidra (Berberis species)	Tikta, Kashaya	Laghu	Ushna	Kandughna, Shothahara
Nimba (Azadirachta indica)	Tikta, Kashaya	Laghu	Sheeta	Krimighna, Raktashodhaka
Manjistha (Rubia cordifolia)	Madhura, Kashaya	Guru	Ushna	Varnya, Ropana
Yashtimadhu (Glycyrrhiza glabra)	Madhura	Guru, Snigdha	Sheeta	Vranaropana

7. Dravyaguna Analysis

The collective Dravyaguna properties of Rasanjanadi Lepa are as follows:

Parameter	Property
Rasa	Tikta, Kashaya
Guna	Laghu, Ruksha
Virya	Ushna
Vipaka	Katu
Doshaghna	Kapha-Vata Shamana

Classical textual support:

तिक्तं कषायं रुक्षं च कफमेहविनाशनम्³

उष्णवीर्यं कफवातहरं⁵

कषायो रोपणः श्रेष्ठः²

8. Pharmacological Actions and Mode of Action

8.1 Anti-inflammatory Action (Shothahara)

The ingredients possess significant anti-inflammatory properties that reduce edema, redness, pain, and local tissue irritation. Curcumin present in Haridra inhibits pro-inflammatory mediators such as NF- κ B, COX-2, and oxidative stress markers.^{12,13,14} Daruharidra contains berberine, which similarly exhibits anti-inflammatory and immunomodulatory activity.¹⁶

8.2 Antimicrobial Action (Krimighna)

Nimba (Neem), Daruharidra (Berberis), and Rasanjana possess broad-spectrum antimicrobial activity against bacterial pathogens commonly associated with chronic wounds.¹⁵⁻¹⁷ The compounds azadirachtin and nimbidin in Neem, berberine in Daruharidra, and related alkaloids in Rasanjana confer this property.

8.3 Wound Cleansing and Debridement (Shodhana and Lekhana)

The Tikta-Kashaya dominant drugs assist in Shodhana Karma by reducing slough, discharge, and unhealthy granulation tissue. This corresponds to the modern concept of wound debridement, which removes necrotic tissue and promotes a clean wound bed essential for healing.¹⁸

8.4 Wound Healing Action (Ropana)

Yashtimadhu and Rasanjana promote fibroblast proliferation, collagen synthesis, and epithelialization, thereby enhancing wound healing.^{13,14} Curcumin in Haridra accelerates wound healing by promoting angiogenesis and tissue regeneration, as demonstrated in experimental models.^{12,14}

8.5 Lekhana and Krimighna Karma

The formulation removes unhealthy tissue and reduces microbial infestation, addressing both the Shodhana and Ropana requirements of Nadi Vrana management.^{11,15}

9. Samprapti Vighatana (Interruption of Pathogenesis)

Rasanjanadi Lepa interrupts the pathogenesis of Nadi Vrana at multiple levels:

Dosha Level

- Pacifies vitiated Kapha Dosha → reduces discharge and induration
- Pacifies Pitta Dosha → reduces suppuration and burning
- Controls Vata Dosha → alleviates pain and sinus tract propagation

Dhatu Level

- Rakta Shodhana → purifies Rakta Dhatu vitiated by infection
- Mamsa regeneration → promotes healthy tissue formation

Local Level

- Antimicrobial action → prevents microbial growth^{15,17}
- Debridement → removes unhealthy tissue¹⁸
- Tissue repair → enhances granulation and epithelialization^{13,14}

10. Discussion

Nadi Vrana is a chronic inflammatory condition requiring prolonged management. Conventional treatment for Pilonidal Sinus often includes surgical excision, drainage, or flap procedures.^{7,8} However, postoperative infection, delayed healing, pain, and recurrence are common complications.²¹

Ayurvedic management emphasizes Shodhana and Ropana principles. Rasanjanadi Lepa appears to provide both actions simultaneously. The Tikta and Kashaya dominant drugs help in reducing Kleda and Puya Srava while promoting tissue contraction and healing.

Haridra and Daruharidra possess proven anti-inflammatory and antimicrobial activities, well-documented in open-access literature.^{12,16} Nimba acts as a natural antiseptic and reduces microbial contamination.¹⁵ Yashtimadhu and Rasanjana support collagen synthesis and tissue regeneration.^{13,14} The combined synergistic effect may accelerate wound healing while minimizing recurrence.

Topical application of Lepa allows direct local action, improves drug concentration at the site of pathology, reduces systemic adverse effects, and supports faster wound contraction. The TIME (Tissue, Infection, Moisture, Epithelialization) framework of modern wound care aligns well with the mode of action of Rasanjanadi Lepa:

- Tissue → Lekhana (debridement)
- Infection → Krimighna (antimicrobial)
- Moisture → Ruksha Guna (reduces excess discharge)
- Epithelialization → Ropana (promotes healing)

Modern pharmacological studies support the role of herbal formulations in chronic wound management due to their antioxidant, antimicrobial, immunomodulatory, and anti-inflammatory properties.^{19,18} Open-access systematic reviews and clinical studies confirm efficacy of such approaches.^{20,21} Therefore, Rasanjanadi Lepa may be considered a promising conservative modality in the management of Nadi Vrana.

11. Conclusion

Nadi Vrana is a chronic sinus disorder comparable to Pilonidal Sinus in modern medicine. Rasanjanadi Lepa possesses multidimensional therapeutic actions including Shodhana, Ropana, Krimighna, Lekhana, and Shothahara properties. The formulation helps in Samprapti Vighatana by reducing Dosha Dushti, controlling infection, promoting wound healing, and preventing recurrence.^{3,5,6}

Based on classical references and freely available modern scientific evidence, Rasanjanadi Lepa may serve as an effective conservative therapeutic option in the management of Nadi Vrana

(Pilonidal Sinus). It provides a scientifically validated, cost-effective, and non-invasive approach aligning with modern wound care principles.^{18,21}

Further randomized controlled clinical studies are required to establish its efficacy scientifically and to standardize the formulation for wider clinical application.

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