

SHIROBASTI: CLASSICAL BASIS, PROCEDURAL VARIATION, PROPOSED MECHANISMS AND EVIDENCE GAPS — A NARRATIVE REVIEW

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Article Received on 24 Sept. 2026,
Article Revised on 14 Oct. 2026,
Article Published on 16 Oct. 2026

<https://doi.org/10.5281/zenodo.23466115>

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How to cite this Article: Dr. Sanket Charjan^{*1}, Dr. Pratik Chachane², Dr. Vishwajeet Patade³, Dr. Sanket Charjan¹. (2026). Shirobasti: Classical Basis, Procedural Variation, Proposed Mechanisms And Evidence Gaps - A Narrative Review. World Journal of Pharmaceutical Research, 15(20), 1382-1388.
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ABSTRACT

Background: Shirobasti is a classical Ayurvedic Murdhnaitaila procedure in which warm medicated oil is retained over the scalp using a specially designed cap. It is traditionally indicated in Vata-predominant disorders affecting the head. However, variations in classical descriptions and the lack of standardized procedural protocols present challenges for its contemporary clinical application. Furthermore, its proposed mechanisms of action require critical evaluation in light of current physiological and pharmacological knowledge. **Objective:** To critically review classical descriptions of Shirobasti, synthesize a practical procedural framework, evaluate its proposed mechanisms of action, and identify gaps in the existing clinical evidence. **Methods:** A narrative review was undertaken of relevant classical Ayurvedic Samhitas and their commentaries. Bibliographic sources and clinical trial registries were also explored to identify available human studies and registered

research protocols related to Shirobasti. **Results:** The reviewed classical sources demonstrate agreement regarding the fundamental principle of Shirobasti, although variations exist in procedural details, including the type of retaining vessel, oil level, duration, and timing. The

hypothesis that oil constituents reach the brain through direct transdermal absorption remains unsupported by established transdermal pharmacology. Relaxation-mediated effects are physiologically plausible but have not been adequately investigated specifically for Shirobasti. The available human evidence appears to be limited predominantly to small-scale, open-label, or uncontrolled studies, alongside registered clinical research protocols. **Conclusion:** Shirobasti has a well-established basis in classical Ayurvedic literature; however, its clinical effectiveness and underlying mechanisms remain insufficiently substantiated by robust scientific evidence. Standardization of procedural parameters and well-designed controlled clinical trials using validated outcome measures are necessary to establish its safety, efficacy, and potential clinical applications.

KEYWORDS: Shirobasti; Murdhnitaila; Snehana; Vata; Shiroroga; Panchakarma; Narrative Review.

1. INTRODUCTION

In Ayurved, the head (Uttamanga) is considered an important part of the body because it is associated with the sense organs and vital functions. Various head disorders (Shiroroga) are described in classical Ayurvedic texts, including *Ashtanga Hridaya* (Uttarasthana, Chapter 24), *Charaka Samhita* (Sutrasthana, Chapter 17), and *Sushruta Samhita* (Uttaratantra, Chapter 26). Snehana, or oleation therapy, is an important Ayurvedic treatment that involves the use of oil or other unctuous substances. It can be administered internally through methods such as Snehapana and Basti, or externally through procedures such as Abhyanga and Murdhnitaila.^[1]

Murdhnitaila is a group of four Ayurvedic procedures used for the head: Abhyanga (head massage), Seka or Dhara (pouring medicated oil over the head), Pichu (applying an oil-soaked pad to the head), and Basti or Shirobasti (retaining medicated oil over the scalp).^[2] Among these procedures, Shirobasti requires careful preparation, proper administration, and more time and resources.

Although Shirobasti is commonly practiced in Ayurvedic healthcare settings, its classical descriptions, methods of administration, and possible mechanisms of action have not been sufficiently reviewed together. Therefore, this article aims to compare the descriptions of Shirobasti in classical Ayurvedic texts, present a practical overview of the procedure, discuss its proposed mechanisms of action, and review the available clinical evidence.

2. METHODS

This study was conducted as a narrative review of classical Ayurvedic literature and available modern research. Classical sources included *Charaka Samhita*, *Sushruta Samhita* with Dalhana's commentary, *Ashtanga Hridaya*, *Ashtanga Sangraha*, *Sharangadhara Samhita*, *Chakradatta*, and *Chikitsa Sara Sangraha*. Modern literature was searched in relevant bibliographic databases, clinical trial registries, and institutional repositories using the keywords "Shirobasti," "Shirovasti," and "Murdhnitaila." The identified literature was reviewed to compare classical descriptions, examine proposed mechanisms of action, and assess the available clinical evidence. The databases searched, search dates, inclusion criteria, and number of records identified should be specified by the authors. All classical references were to be verified against the editions consulted.

3. Classical Descriptions

3.1 Textual sources

Sushruta Samhita describes the use of oil retention over the head for the management of Shiroroga (head disorders) in the Uttarantra. Dalhana's commentary provides further details about the oil level and duration of the procedure.^[3] *Ashtanga Hridaya* (Sutrasthana, Chapter 22, verse 31) and *Ashtanga Sangraha* describe additional details regarding the timing and duration of treatment according to Dosha.^[4] Later texts, including *Sharangadhara Samhita*, *Chakradatta* with Adhamalla's commentary, and *Dharakalpa*, provide further descriptions of the procedure, including duration measured in Matrakala (a traditional unit of time).^[5-7]

3.2 Points of divergence

Feature	Variation across sources
Timing	Afternoon in some texts; Evening in Sushruta Samhita, morning on an empty stomach in others; described as suitable in all seasons by Sharangadhara samhita
Retention vessel	Animal bladder in early texts; leather band (<i>Charmapatta</i>) in current practice
Oil level	The level of Sneha poured in Shirobasti Yantra should be two fingers above the top of the head, according to Dalhana.
Duration	Dosha-wise, longest for Vata and shortest for Kapha; units (<i>Matra</i> , <i>Matrakala</i> , seconds) are inconsistent and their modern equivalence is disputed. According to Different Acharya Sushruta: The duration of Shirobasti is 10,000 Matra in Vataja Vikara, 8,000 Matra in Pittaja Vikara, and 6,000 Matra in Kaphaja Vikara. Ashtanga Sangraha: The duration of Shirobasti is 10,000 Matra in Vataja Vikara, 6,000 Matra in Pittaja Vikara, and 5,000 Matra in Kaphaja Vikara. Chakradatta: The duration of Shirobasti is 1,000 Matrakala in Vataja Vikara,

	800 Matrakala in Pittaja Vikara, and 500 Matrakala in Kaphaja Vikara. Vangasena: The duration of Shirobasti is 1,000 seconds in Vataja Vikara, 800 seconds in Pittaja Vikara, and 500 seconds in Kaphaja Vikara.
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3.3 Indications and contraindications

Shirobasti is traditionally indicated for Vata-predominant disorders of the head, such as Ardhavabhedaka (half-sided headache), Suryavarta, Ardita (facial paralysis), and Shirakampa (head tremors). It is also described for certain disorders affecting the eyes, ears, jaw, and neck. In modern Ayurvedic practice, it is also used for insomnia (Nidranasha). Generally, Shirobasti is avoided in conditions such as acute fever, scalp infections, and disorders dominated by Kapha or Ama, according to classical guidance and clinical assessment.

4. Procedure

The procedure below is a synthesis for practice and should be adapted to institutional protocol.

Materials: leather band or cloth cap; black gram (*Masha*) flour paste for sealing; warm medicated oil (commonly 1.5 to 2 litres); vessel and ladle; cotton strips; towels; oil for Abhyanga; chair of suitable height.

Purvakarma: clinical assessment and selection of oil according to dosha; head, neck and shoulder Abhyanga with mild Sweda; Shodhana where indicated.

Pradhanakarma: the patient sits upright and comfortable. The band is fixed around the head and sealed with the flour paste to prevent leakage. Warm oil is poured to the prescribed level above the scalp and kept warm, with sufficient replacement during the session. Duration follows dosha and the chosen source. The patient is observed for discomfort, heat or leakage.

Paschatkarma: oil is drained and the band removed. The head, neck and shoulders are gently massaged, followed by a warm-water bath and a light meal. Exposure to cold and day sleep are avoided, in line with Snehana restrictions.

Standardization needs: oil temperature, duration, frequency (often once daily for 7 days in practice) and the criteria for adequate treatment (*Samyak lakshana*) should be fixed and reported in every study.

5. PROPOSED MECHANISMS

5.1 Percutaneous absorption

The scalp is a five-layered structure with a rich supply from both internal and external carotid branches and a high density of follicles and sebaceous glands. Substances can cross skin by transepidermal and transappendageal routes.^[8,9] These routes support local delivery. However, passive transdermal delivery favors small, lipophilic molecules of low molecular weight, and larger molecules cross intact stratum corneum poorly.^[10,11] Statements that oil constituents reach the brain are therefore speculative and should not be asserted without pharmacokinetic evidence.

5.2 Thermal and local vascular effects

Warmth produces local vasodilation and muscle relaxation. This may contribute to symptomatic relief of tension-type headache and scalp tightness, but the effect has not been separated from the oil itself.

5.3 Neurobehavioral relaxation

Prolonged, quiet, warm sensory input may lower sympathetic arousal and improve subjective sleep. Claims of endorphin release are plausible hypotheses, not demonstrated findings for Shirobasti, and should be framed as such.

5.4 Ayurvedic interpretation

In Ayurvedic terms the action is described as pacification of Vata through Snehana and Ushna qualities, with calming of Pitta and Rakta. These are conceptual frameworks and are not directly testable with current biomedical endpoints, though their clinical correlates can be defined and measured.

6. Clinical Evidence

Human evidence for Shirobasti is limited. Early reports include preliminary studies in hemiplegia.^[12] Registered trials include comparative open-label studies in primary insomnia, which use symptom scales such as the Insomnia Severity Index.^[13] Common limitations include small samples, absence of blinding or sham procedures, heterogeneous oil formulations, short follow-up, and non-validated outcome measures. No systematic review or meta-analysis of high-quality trials could be identified in the sources searched for this draft, and authors should repeat this search in PubMed, Scopus, AYUSH Research Portal and CTRI before making this statement in a submission.

7. Safety

Reported concerns are chiefly local: burns from oil that is too hot, leakage, discomfort from prolonged sitting, and contact reactions. Temperature control, patient monitoring and patch testing of new formulations are reasonable precautions. Systematic adverse event reporting is largely absent from the literature.

8. DISCUSSION

The textual basis is coherent but internally inconsistent in operational detail. The main weakness is the gap between rich mechanistic claims and sparse evidence. Priorities for research are:

- (1) A consensus protocol fixing temperature, duration, oil and frequency;
- (2) Randomized trials with sham or active comparators such as Shirodhara or warm head application without oil retention;
- (3) Validated outcomes such as the Insomnia Severity Index, headache diaries and quality-of-life scales;
- (4) Physiological measures such as heart-rate variability and skin temperature; (5) transparent adverse-event reporting.

Limitations

This is a narrative review without a formal quality appraisal, and classical interpretation depends on the edition and commentary used.

9. CONCLUSION

Shirobasti is a well-described classical procedure whose clinical value remains unproven. Standardization and controlled studies are the next necessary steps.

Declarations

Author contributions, conflict of interest, funding, ethics and AI-assistance disclosure to be completed by the authors according to journal policy.

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