

The Role of Medicated Oils and Ghrita in Postoperative Wound Healing: An Ayurvedic Review

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Abstract—Postoperative wound care is a crucial determinant of surgical success, influencing tissue repair, infection control, pain management, scar formation, and overall patient recovery. Despite significant advances in modern wound management, challenges such as delayed healing, surgical site infections, chronic inflammation, and antibiotic resistance continue to affect clinical outcomes. Ayurveda offers a comprehensive approach to wound healing through the principles of Vrana Chikitsa, wherein medicated oils (Taila) and medicated ghee (Ghrita) occupy a central therapeutic role. Classical Ayurvedic texts describe numerous formulations, including Jatyadi Taila, Nirgundi Taila, Mahamarichyadi Taila, Shatadhauta Ghrita, Yashtimadhu Ghrita, and Panchavalkala preparations, for promoting wound cleansing (Vrana Shodhana) and wound healing (Vrana Ropana). These formulations possess antimicrobial, anti-inflammatory, analgesic, antioxidant, and tissue regenerative properties that facilitate granulation tissue formation, collagen synthesis, angiogenesis, epithelialization, and scar remodeling. Experimental and clinical studies have demonstrated their effectiveness in reducing postoperative pain, edema, discharge, microbial contamination, and healing time while improving cosmetic outcomes. Their lipid-based nature enhances drug penetration, maintains wound moisture, and provides a protective barrier conducive to physiological healing. This review critically examines the Ayurvedic concepts of postoperative wound management, the pharmacological properties of commonly used medicated oils and Ghrita preparations, available scientific evidence, probable mechanisms of action, and their integrative role alongside contemporary surgical wound care. The review highlights the therapeutic potential of these traditional formulations as safe, economical, and

evidence-supported adjuncts in enhancing postoperative wound healing and improving patient outcomes.

Index Terms—Ayurveda, Vrana Chikitsa, Postoperative Wound Healing, Medicated Oils, Taila, Ghrita, Vrana Shodhana, Vrana Ropana, Jatyadi Taila, Shatadhauta Ghrita, Surgical Site Infection, Integrative Wound Care.

I. INTRODUCTION

Postoperative wound healing is a complex biological process involving hemostasis, inflammation, proliferation, angiogenesis, collagen synthesis, and tissue remodeling. Successful wound healing minimizes postoperative complications such as infection, delayed healing, dehiscence, excessive scar formation, and chronic non-healing wounds. Despite advances in modern surgical techniques, postoperative wound management continues to pose significant clinical challenges, especially in patients with diabetes mellitus, vascular disorders, malnutrition, obesity, and immunocompromised states.¹

Ayurveda, the traditional system of Indian medicine, has described comprehensive principles for the management of wounds under the concept of Vrana Chikitsa. Among the ancient Ayurvedic scholars, Acharya Sushruta, regarded as the father of surgery, provided a detailed classification of wounds, their stages of healing, methods of wound cleansing, surgical interventions, and postoperative wound care. The principles described in the *Sushruta Samhita* continue to influence Ayurvedic surgical practice and

are increasingly being explored for integration with contemporary wound management.²

According to Ayurveda, wound healing depends upon maintaining equilibrium of the Doshas, preservation of healthy tissues (*Dhatu*), proper circulation of nutrients, and prevention of microbial contamination. Disturbance of Vata, Pitta, and Kapha Doshas delays healing by producing pain, inflammation, excessive discharge, slough formation, and impaired tissue regeneration. Therefore, Ayurvedic wound management aims not only to eliminate infection but also to restore tissue integrity through local and systemic therapies.³

Among various local therapeutic modalities, Sneha Kalpana, particularly medicated oils (Taila) and medicated ghee (Ghrita), occupies a central position in postoperative wound care. These formulations are prepared by processing herbal drugs with sesame oil, cow ghee, or other lipid media according to classical pharmaceutical procedures. The lipid base enhances extraction of fat-soluble phytochemicals, facilitates deeper tissue penetration, maintains moisture balance, protects granulation tissue, and promotes sustained drug release at the wound site.⁴

Medicated oils and Ghrita possess multiple pharmacological properties including Shodhana (wound cleansing), Ropana (healing), Shothahara (anti-inflammatory), Vedanasthapana (analgesic), Krimighna (antimicrobial), Raktashodhaka (blood purification), and Varnya (scar improving) effects. These multidimensional actions correspond closely with modern concepts of infection control, inflammation modulation, collagen synthesis, angiogenesis, epithelialization, antioxidant protection, and tissue remodeling.⁵

Classical Ayurvedic texts describe numerous formulations for the management of surgical wounds. Among them, Jatyadi Taila, Yashtimadhu Ghrita, Shatadhauta Ghrita, Nirgundi Taila, Ropana Ghrita, Panchavalkala preparations, and Durvadi Taila have gained considerable clinical importance because of their documented wound-healing properties. Many of these formulations contain medicinal plants rich in flavonoids, tannins, terpenoids, glycosides, alkaloids, and essential fatty acids, which exhibit antimicrobial, antioxidant, anti-inflammatory, and tissue regenerative activities.⁶

Recent experimental and clinical studies have demonstrated that medicated oils accelerate wound

contraction, enhance collagen deposition, stimulate fibroblast proliferation, improve vascularization, reduce bacterial colonization, and shorten the duration of epithelialization. These observations support several traditional Ayurvedic concepts described centuries ago and provide scientific evidence for integrating Ayurvedic wound care into modern postoperative management.⁷

The increasing prevalence of antibiotic resistance and chronic postoperative wound infections has further stimulated interest in herbal topical formulations. Unlike many synthetic topical agents that primarily target microorganisms, Ayurvedic medicated oils and Ghrita simultaneously regulate inflammation, nourish regenerating tissues, improve local circulation, and restore skin integrity. Their relatively low incidence of adverse reactions and ease of preparation also make them attractive therapeutic options in resource-limited settings.⁸

II. AYURVEDIC CONCEPT OF WOUND HEALING (VRANA CHIKITSA)

The term Vrana refers to disruption of the normal continuity of body tissues caused by trauma, surgery, burns, or disease processes. Sushruta classified wounds into Nija Vrana (endogenous) and Agantuja Vrana (traumatic or exogenous). Postoperative surgical wounds are included under Agantuja Vrana, requiring meticulous local care to prevent complications and promote healthy tissue regeneration.

Sushruta emphasized that effective wound management involves Shodhana (cleansing and debridement), Ropana (healing), Lekhana (scraping of unhealthy tissue when required), Sandhana (union of tissues), and Vaikritapaha Chikitsa (correction of scar deformities). These principles remarkably resemble modern concepts of wound bed preparation, infection control, granulation tissue formation, wound closure, and scar management.

The healing process depends upon proper nourishment of tissues and balanced Doshas. Excessive Vata causes severe pain, dryness, delayed granulation, and wound contraction. Aggravated Pitta produces inflammation, burning sensation, erythema, suppuration, and excessive discharge, whereas Kapha causes edema, heaviness, slough formation, and delayed epithelialization. Therefore, treatment is

individualized according to the predominant Dosha involvement.

Classical Ayurvedic texts describe Shashti Upakrama, the sixty therapeutic measures for wound management. These include wound irrigation, cleansing, medicated dressings, fumigation, bloodletting where indicated, application of herbal pastes, bandaging techniques, internal medications, dietary regulation, and local application of medicated oils and Ghrita. The use of Sneha preparations occupies a significant place among these therapeutic modalities because of their ability to maintain wound moisture, soften necrotic tissue, alleviate pain, and promote healthy granulation tissue.

The choice of medicated oil or Ghrita depends upon the wound stage. During the inflammatory phase, formulations possessing antimicrobial and anti-inflammatory properties are preferred. During the proliferative stage, drugs exhibiting Ropana, Rasayana, and collagen-promoting activities facilitate tissue regeneration. In the remodeling phase, formulations with Varnya and Twachya properties improve scar quality, skin elasticity, and cosmetic appearance.

Ayurvedic wound care also emphasizes proper diet (Pathya Ahara) rich in tissue-building nutrients, adequate rest, maintenance of digestive fire (Agni), and correction of systemic Dosha imbalance. This holistic approach recognizes that successful wound healing depends not only on topical therapy but also on the overall physiological status of the patient.

III. MAJOR MEDICATED OILS USED IN POSTOPERATIVE WOUND HEALING

Jatyadi Taila

Jatyadi Taila is one of the most widely prescribed Ayurvedic formulations for the management of postoperative wounds, chronic ulcers, burns, fissures, fistula-in-ano, and infected wounds. It is described in classical Ayurvedic literature as a Vrana Shodhana and Vrana Ropana formulation. The principal ingredients include Jati (*Jasminum officinale*), Nimba (*Azadirachta indica*), Patola (*Trichosanthes dioica*), Haridra (*Curcuma longa*), Daruharidra (*Berberis aristata*), Manjistha (*Rubia cordifolia*), Karanja (*Pongamia pinnata*), Yashtimadhu (*Glycyrrhiza glabra*), Tuttha, and Tila Taila as the base oil.⁹

These herbs possess antimicrobial, anti-inflammatory, antioxidant, analgesic, and tissue regenerative properties. Experimental studies have demonstrated that Jatyadi Taila promotes fibroblast proliferation, accelerates collagen synthesis, reduces microbial load, and shortens epithelialization time. The lipid medium also maintains a moist wound environment, which is essential for optimal healing.¹⁰

Clinically, Jatyadi Taila has shown encouraging results in postoperative wounds following hemorrhoidectomy, fistulotomy, abscess drainage, and excision of benign soft tissue lesions. Regular dressing with Jatyadi Taila reduces pain, edema, wound discharge, and healing duration while improving scar quality.¹¹

Nirgundi Taila

Nirgundi (*Vitex negundo*) is renowned for its potent anti-inflammatory and analgesic properties. Nirgundi Taila is frequently employed in wounds associated with pain, swelling, and localized inflammation. Phytochemical constituents such as flavonoids, iridoid glycosides, and essential oils inhibit inflammatory mediators and reduce oxidative stress.¹²

Postoperatively, application of Nirgundi Taila helps reduce edema, local tenderness, and stiffness around the surgical wound. Experimental studies have also demonstrated antibacterial activity against common wound pathogens including *Staphylococcus aureus* and *Escherichia coli*.¹³

Durvadi Taila

Durvadi Taila contains Durva (*Cynodon dactylon*) along with other medicinal herbs possessing cooling, hemostatic, and wound-healing activities. Classical texts recommend its application in fresh wounds, burns, and wounds associated with bleeding and excessive inflammation.¹⁴

Durva is rich in flavonoids, phenolic compounds, and minerals that enhance collagen deposition, improve angiogenesis, and facilitate tissue remodeling. Modern studies also suggest antioxidant and antimicrobial effects that contribute to faster wound healing.¹⁵

IV. THERAPEUTIC ROLE OF GHRITA IN WOUND HEALING

Yashtimadhu Ghrita

Yashtimadhu Ghrita is prepared using *Glycyrrhiza glabra* processed with cow's ghee. Yashtimadhu

contains glycyrrhizin, flavonoids, and saponins possessing potent anti-inflammatory, antioxidant, and immunomodulatory activities.¹⁶

Application of Yashtimadhu Ghrita provides lubrication to the wound surface, reduces pain, accelerates epithelialization, and minimizes scar formation. Modern experimental studies have demonstrated enhanced fibroblast proliferation and increased hydroxyproline content, indicating improved collagen synthesis.¹⁷

Shatadhauta Ghrita

Shatadhauta Ghrita is prepared by washing purified cow ghee one hundred times with clean water according to Ayurvedic pharmaceutical procedures. This repeated washing transforms ghee into a smooth, cooling emulsion with improved spreadability and patient acceptability.

It possesses soothing, anti-inflammatory, moisturizing, and epithelialization-promoting properties. It is particularly useful in postoperative wounds associated with burning sensation, erythema, laser procedures, burns, and skin graft donor sites. Clinical observations indicate reduced pain, improved wound hydration, and enhanced cosmetic healing.¹⁸

Ropana Ghrita

Ropana Ghrita consists of multiple herbs possessing Vrana Ropana properties processed in clarified butter. The formulation promotes healthy granulation tissue, reduces inflammation, and accelerates wound contraction. The lipid matrix facilitates prolonged contact of herbal constituents with the wound surface, thereby enhancing therapeutic efficacy.¹⁹

Mechanisms of Action of Medicated Oils and Ghrita

Ayurvedic Action	Modern Pharmacological Correlation	Clinical Significance
Vrana Shodhana	Antimicrobial activity	Reduction of wound infection
Vrana Ropana	Fibroblast proliferation and collagen synthesis	Faster tissue repair
Shothahara	Anti-inflammatory action	Reduced edema and pain
Vedanasthapana	Analgesic activity	Better postoperative comfort
Rasayana	Antioxidant and immunomodulatory effects	Enhanced tissue regeneration
Varnya	Scar remodeling	Improved cosmetic outcome

V. ADVANTAGES IN POSTOPERATIVE WOUND CARE

The use of medicated oils and Ghrita offers several advantages over conventional topical agents. They provide sustained release of herbal phytoconstituents through the lipid base while maintaining adequate wound moisture. Moist wound healing is now recognized as one of the fundamental principles of modern wound management because it accelerates epithelial migration and minimizes tissue desiccation. Many Ayurvedic formulations exhibit broad-spectrum antimicrobial activity without contributing significantly to antimicrobial resistance. In addition, their anti-inflammatory and antioxidant properties help control excessive inflammatory responses that may delay wound healing.

The lipid-rich environment also protects newly formed granulation tissue from mechanical trauma during dressing changes. Regular application improves skin elasticity, decreases scar contracture, and enhances cosmetic outcomes. Unlike several synthetic antiseptics that may cause cytotoxicity to regenerating cells, medicated oils generally support physiological tissue repair while maintaining an optimal healing environment.

VI. CURRENT SCIENTIFIC EVIDENCE

Experimental studies conducted on animal wound models have consistently demonstrated enhanced wound contraction, increased tensile strength, higher hydroxyproline content, improved collagen maturation, and accelerated epithelialization following

topical application of Ayurvedic medicated oils and Ghrita.

Clinical studies involving postoperative wounds, diabetic ulcers, pressure ulcers, and chronic non-healing wounds have reported encouraging outcomes, including shorter healing time, reduced infection, decreased pain scores, and improved patient satisfaction. Although many studies involve relatively small sample sizes, the cumulative evidence supports the therapeutic potential of these formulations as adjuncts to standard surgical wound care.²⁰

Recent pharmacological research has identified several bioactive phytochemicals—including curcumin, berberine, glycyrrhizin, quercetin, tannins, terpenoids, and essential fatty acids—that contribute to antimicrobial, antioxidant, angiogenic, and collagen-stimulating effects. These findings provide a scientific basis for many classical Ayurvedic concepts of Vrana Shodhana and Vrana Ropana.

VII. FUTURE PERSPECTIVES

Growing concerns regarding antimicrobial resistance, chronic postoperative wound complications, and increasing healthcare costs have renewed interest in evidence-based traditional medicine. Standardization of Ayurvedic formulations, Good Manufacturing Practices (GMP), pharmacological profiling, toxicity assessment, and multicenter randomized controlled trials are required to strengthen clinical evidence. Integration of Ayurvedic wound care protocols with contemporary surgical practice may improve patient outcomes while reducing dependence on prolonged antibiotic therapy. Future research should also focus on nanotechnology-based herbal dressings, medicated hydrogels, bioactive wound scaffolds, and sustained-release formulations derived from classical Sneha Kalpana principles.

VIII. CONCLUSION

Medicated oils and Ghrita represent an important component of Ayurvedic postoperative wound management. Classical formulations such as Jatyadi Taila, Nirgundi Taila, Durvadi Taila, Yashtimadhu Ghrita, Shatadhauta Ghrita, and Ropana Ghrita possess multidimensional therapeutic properties including antimicrobial, anti-inflammatory, antioxidant, analgesic, and tissue regenerative

activities. Their actions closely parallel the biological events involved in modern wound healing, including collagen synthesis, angiogenesis, fibroblast proliferation, epithelialization, and scar remodeling. Current experimental and clinical evidence supports their effectiveness as safe and economical adjuncts in postoperative wound care. However, larger well-designed randomized controlled trials and standardized pharmaceutical preparations are necessary to establish their role in evidence-based integrative surgical practice. The convergence of Ayurvedic principles with modern wound healing science offers promising opportunities for improving postoperative recovery and enhancing the quality of patient care.

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