



Review Article

MOIST WOUND HEALING: PERSPECTIVES FROM AYURVEDA

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ABSTRACT

Wounds are a primary affliction. The healing of wounds is a complex mechanism that calls for a multipronged approach. Wounds have been observed to heal faster in a moist atmosphere as compared to a dry environment. Ayurveda the ancient science of life discusses wound management in Shashti Upakramas or sixty measures. Moist wound healing as a concept has been known to Ayurveda, as is evident from the emphasis on preserving moisture for proper healing of wounds. It is also proved from the extensive use of topical emollients; especially honey, cow ghee and sesame oil. These base materials as well as the scientific principles behind their efficacy merit a relook in contemporary times.

Keywords: Ayurveda, ghee, honey, moist wound healing, sesame oil, wounds

INTRODUCTION

A wound is defined as a disruption in the continuity of the epithelial lining of the skin or mucosa. Wound healing is an intricate process that involves the following stages: a) Haemostasis b) Inflammation c) Proliferation and d) Tissue remodelling. Non-healing wounds have of late proved to be a formidable medical challenge. Ayurveda the ancient science of life documents wound management under Shashti Upakrama-60 measures in the encyclopaedic work on surgery, the Susruta Samhita¹. Moist wound healing as an important aspect related to healing of wounds seems to have been in vogue since ancient times in India. Natural pharmaceuticals used for wound healing in Ayurveda like honey, sesame oil and cow ghee not only provides a moist environment but also help wound healing in many other ways. This article reviews the Shasti Upakramas for the science behind moist wound healing measures enlisted in them.

Contemporary Researches

There is a growing awareness amongst practitioners today about the advantages of a moist wound healing atmosphere. Modern science warmed up to the idea of moist wound healing about fifty years ago in 1962 when George D. Winter discovered that epithelialisation, would proceed twice as fast in a moist environment than under a dry scab². It was inferred that the benefits of a moist environment include prevention of tissue dehydration and cell death and accelerated angiogenesis³. In 2003, a framework for local wound management was developed under the acronym TIME⁴. TIME summarises four aspects of wound management namely Tissue management, Infection control Moisture balance and Edge advancement. The importance of moisture balance in wound bed preparation is now well established. Yet contemporary approaches seek to maintain moisture with occlusive bandages overlooking the idea of nutrition, oxygenation and a shield from bio-films that traditional topical applications might provide.

Ayurvedic Wound Healing Principles

Ayurveda has a comprehensive wound care management in place. The fundamental approach of Shodhana or cleansing followed by Ropana or healing is advised by Susruta to be followed as a dictum⁵. While modern medicine relies heavily on infection control for wound healing to take place Ayurveda considers both cleansing (anti infective measures) and healing (granulation and tissue remodelling) to be of equal importance. The sixty Upakramas or measures listed in Susruta include systemic wound healing measures, local wound healing measures, the different pharmaceutical formulations as well as the various means by which they could be applied. There is extensive use of honey, cow ghee and sesame oil in the formulations used. Oil has been mentioned as a nutritive for tissues as underlined in the translated quote from Susruta. "As trees put forth sprouts on watering the roots, dhatus (tissues) grow by administration of oil baths⁶."

Moist Wound Healing in Ayurveda

The local wound healing measures from among the 60 Upakramas have been depicted in the Figure 1. It is clear from the figure that of the nine pharmaceutical formulations prescribed Utkarika, Kasaya, Varti, Kalka, Sarpih, Taila, Rasakriya, Madhu Saprish and Avachurnana⁷ only the last i.e. Avachurnana or dusting powder provides a dry environment. The rest eight provide moist wound healing. Sneha sangrahanaya (preservation of moisture) has been an important concept. Roukshyadanuparohatam (wound not healing due to dryness) is a counter concept as well⁸, as underlined in the factors that affect wound healing. Bandaging is an important measure to protect wounds from infections and enable local moisture balance⁹. One of the means to cover a wound was Patradana (covering with leaf) which was recommended for moisture preservation since it does not absorb the active fraction of the drugs¹⁰. Honey and ghee have been described for topical applications singly, in combination and processed with other wound healing herbs in formulations.

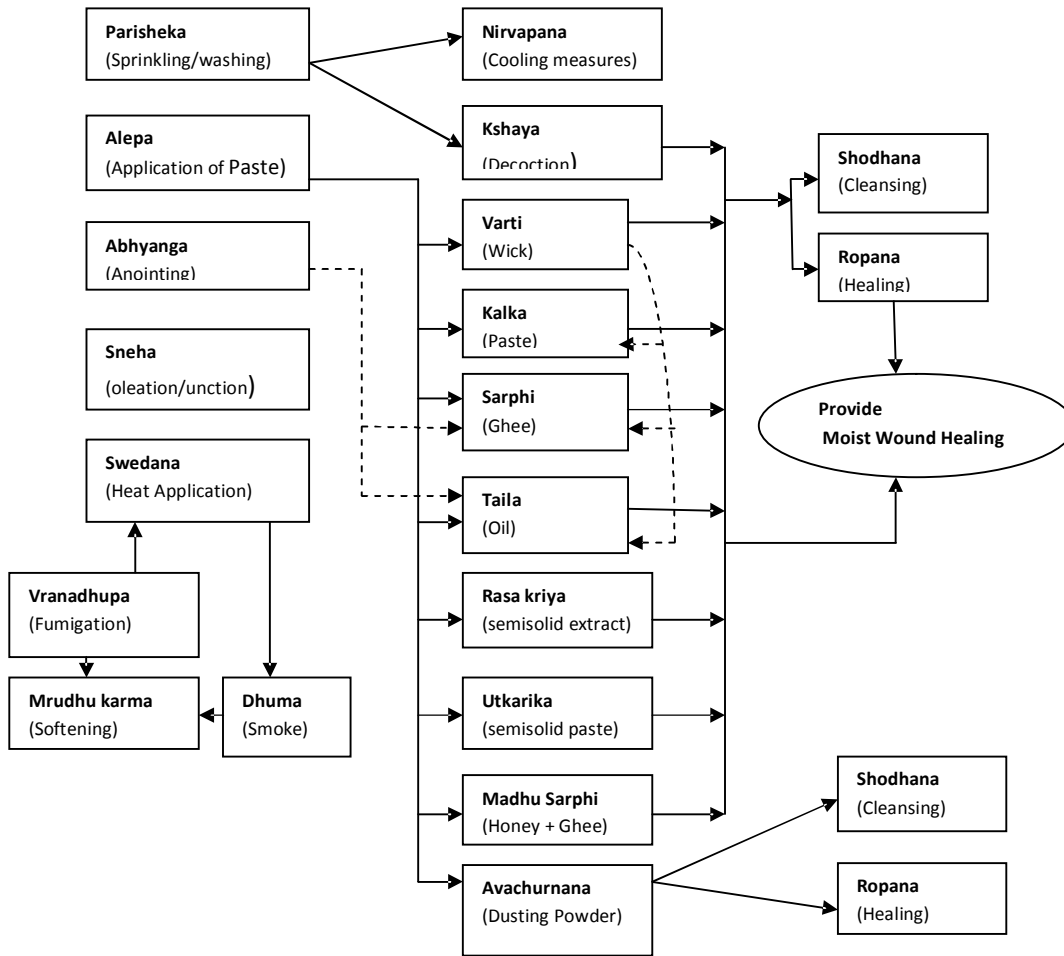


Figure 1: Local Wound Healing Measures

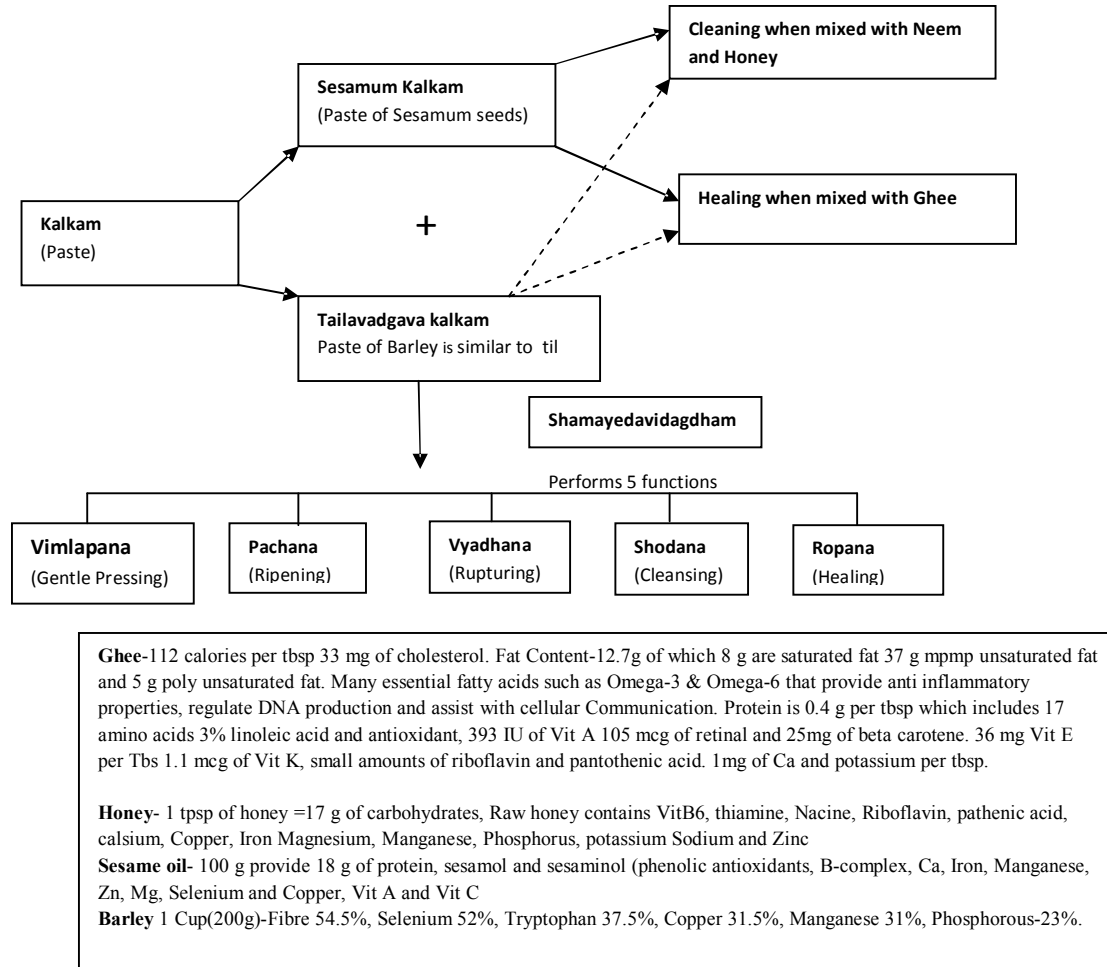


Figure 2: Base Materials used for topical Pharmaceutical applications

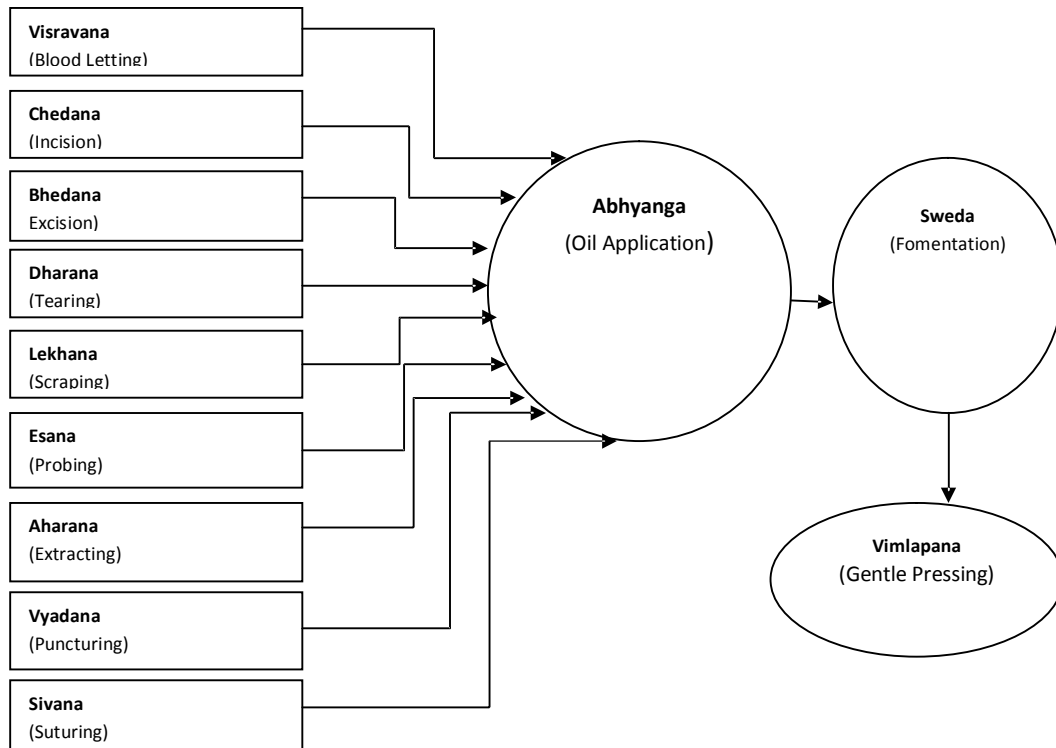


Figure 3 : Post Surgical provision of moisture for wound healing.

The Ropana concept rests primarily on honey, sesame oil or cow ghee based medicines. Madhusarpis a mix of honey and ghee is one of the 60 Upakramas. There are references also to barley paste which has been noted to be similar in wound healing properties to sesame paste.

Surgical Wound Management and Moisture Balance

Ayurveda discusses Abhyanga or oil applications as a post surgical measure, again underlining the significance of a moist and nourishing atmosphere for healing of surgical wounds¹¹. Bloodletting a para- surgical measure also culminates with oil application. Accidental wounds described as six types by ancient surgeons namely, severed, ruptured, punctured, lacerated, crushed and abraded also follow the line of treatment of irrigation with oil and ghee after initial cleansing and clearance of foreign objects. Bandaging is done to retain the medicated oil or ghee.

Moisture Oriented Bases Used in Ayurveda

Honey

Honey is the most widely used in the management of wounds in Suśruta. Today there is evidence to support the use of honey from laboratory studies. In a work with culture of leucocytes, honey has been shown to stimulate cytokine production by monocytes¹². Honey stimulates inflammatory cytokine production from monocytes. The release of cytokines is what initiates the tissue repair process as well as the immune response of the infection. Also stimulation by honey of other aspects of the immune response, the proliferation of B- and T- lymphocytes and activity of phagocytes has been shown¹³. It has been demonstrated that honey stimulates the production of antibodies in mice in response to antigens from *E. coli*. These findings suggest that part of the effectiveness of honey in preventing infection in wounds may be due to the improvement of the body's own immunity as well as being due to the anti bacterial activity of honey. Honey has a pH of 3.2-4.5, prevents colonization and is anti bacterial due to the presence of hydrogen peroxide¹⁴. It promotes natural healing process. It is Vranaropaka. Honey is Yogavahi (synergist). It is union promoting, cleansing and healing. It permeates through minute channels. It has Madhura, Kasaya rasa and is Picchila, sheeta, Laghu. The Madhura rasa exerts a nutrient effect on tissues. While kasaya rasa cleanses wound surface, Picchila guna helps in retention of moisture. Sheeta guna relieves inflammation¹⁵.

Cow Ghee

Cow ghee is a rich source of essential fatty acids (EFAs) which regulate prostaglandin synthesis and hence induce wound healing¹⁶. Ghee has been described as Sanskaranuvartini (that which assimilates the properties of other drugs processed with it) in Charaka Samhita, the fundamental treatise on Ayurveda¹⁷. Hence it is an ideal base for wound healing applications. For burn wounds Shatadhouta ghrita (ghee washed in water a hundred times) and Sahasradhouta ghrita (ghee washed in water a thousand times over) have been recommended for tissue regeneration.

Sesame Oil

Sesame oil is a source of antioxidant vitamins A and E. It contains Sesamol. The anti oxidants give protection against oxidative damage and promote healing. This could be the reason for enhanced wound healing activity observed on experiments on rats^{18,19}. Sesame is slightly astringent, bitter, sweet, unctuous, beneficial for wound and beneficial for

wound as external paste²⁰. Sesame oil has been recommended in traumatic wounds, fractures, burn wounds and animal bites²¹. Severed body parts are repositioned sutured and irrigated with sesame oil before being bandaged²². The success of Susrutas rhinoplasty could be attributed to copious and frequent irrigation of the repaired area with sesamum oil.

DISCUSSION

Moist wound healing from Ayurveda is more than mere moisture retention. Since emollients are used, they permeate easily through skin and deeper fascia; they are full of nutrients and provide the right pH (acidic) for healing. The moisture balance is mostly sought to be maintained with occlusive bandaging in conventional wound care whereas Ayurveda makes use of emollients for the purpose. It is also to be noted that these are time tested moist healing practices that worked to create an environment of oxygenation, nutrition and the right pH while preventing cell death. Moist wound healing is a concept in vogue since centuries in India. While there has been an acknowledgement of wound healing properties of honey as a result of scientific research on it, cow ghee and sesame oil which form the mainstay of wound healing in Ayurveda are still underutilised.

CONCLUSION

The concept of moist wound healing has attained therapeutic significance underscored by its inclusion in the TIME framework. Honey has been validated as a healing agent through numerous studies across the globe. Cow ghee and Sesame oil advocated in most pharmaceutical wound healing preparations are yet to gain main stream acceptance. Ayurveda and other traditional systems need to be revisited for potential solutions for non-healing wounds in contemporary times.

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