



A REVIEW ON VAIKRUTAPAHA CHIKITSA IN THE MANAGEMENT OF VRANA (WOUND)

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DOI: 10.7897/2277-4572.106220

Received on: 02/01/22 Revised on: 28/01/22 Accepted on: 11/02/22

ABSTRACT

Vrana chikitsa has been given more emphasis since *Samhita* period, an elaborated description found in Sushruta Samhita for its effective management under the heading of Shashti upakrama, out of which certain procedures are explained for the management of skin abnormalities which are called as Vaikrutapaha chikitsa, these procedures infer regarding the fact that cosmetology was given utmost importance in Ayurveda. In current scenario, the practice of Vaikrutapaha chikitsa remains unnoticed in the presence of modern surgical measures, these are costly, may be out of reach for common man. So, there is need of natural result-oriented procedure which are economical and carries minimal side effects. So, these techniques can be critically evaluated and implemented for the curative and cosmetic aspect of Vrana chikitsa.

KEY WORDS: Vaikrutapaha chikitsa, Cosmetology in Ayurveda, Utsadana, Romasanjanana, Krishna karma, Pandu karma

INTRODUCTION

Wound healing is a mechanism whereby the body attempts to restore the integrity of the injured part. However, this falls far short of the regeneration of tissue by pluripotent cells, seen in some amphibians, and is often detrimental, as seen in the problems created by scarring such as adhesions, keloids, contractures¹ etc which poses cosmetic problems.

In Ayurvedic classics a special emphasis is given for the management of Vrana. Acharya Sushruta in his treatise Sushruta Samhita has elaborately explained regarding Vrana and Vranopakramas, he mentioned Shasti upkrama² for treating the Vrana according to its different stages with specific features. The word Vrana is defined as the condition where tissue undergoes destruction, after healing of the Vrana it leaves scar it may be sometimes hypertrophied or elevated or depressed compared surrounding skin, there may be discolouration, hypo or hyper pigmentation, excess or no hair growth, contractures etc which results in some sorts of abnormalities, in order to treat such abnormalities Sushruta has mentioned Vaikrutapaha upakramas.

Vaikrutapaha means removing or preventing change i.e correction of all sorts of abnormalities in Vrana and Vrana vastu after its healing, while explaining the chikitsa of Vrana shopa Sushruta Acharya mentioned Vaikrutapaha is seventh measure to treat Vrana shopa (Saptamam Vaikrutapaham)³ Commenting on this Dalhana says Vaikrutapaha is nothing but restoring the normalcy of skin colour, hair etc on the scar tissue (Vaikrutapahamiti savarnakarana romasanjananaadi).

Among the Shashti Upakrama Vaikrutapaha chikitsa includes mainly seven procedures:

1. Utsadana (stimulating granulation)
2. Avasadana (depressing granulation)

3. Pandukarma (inducing hypopigmentation)
4. Krishnakarma (inducing hyperpigmentation)
5. Pratisarana (removing fibrosed skin by rubbing)
6. Romasanjanana (methods to stimulate hair growth)
7. Lomapaharana (depilation)

According to some Acharya's Vaikrutapaham includes from Utsadana to Raksha vidhana (26 Upakrama)

Mechanism of Wound Healing

The wound healing is considerably different in foetuses and adults. In Foetus wound healing usually will not have scar formation and inflammation also will be very less. In foetus rapid epithelial cell formation occurs collagen proposition is high and fibroblast migration is fast. Granulation fibroblast are less in foetus⁴.

Wound healing and tissue repair occur in four stages, in normal adult condition:

1. Haemostasis (Scab formation)
2. Inflammatory Stage (Inflammation and oedema formation)
3. Proliferative Stage (Granulation tissue formation)
4. Remodelling Stage (Scar formation)

Haemostasis

In haemostasis stage at the injured site blood vessels contract, and leaked blood from the wound coagulate and scab formation takes place. Coagulation takes place from the aggregation of thrombocytes and forms fibrin network. The fibrin network serves as the basis for a clot and temporary matrix for migrating cells. Cytokines and growth factors released from thrombocytes serve as pro-inflammatory signals at the wound site and attract the immune response.

Inflammatory Stage

Inflammatory stage starts when neutrophils reach the wound site, within few minutes Neutrophils reach the wound and continue to accumulate for several days. These neutrophils from the beginning of injury entrap the microorganisms present at the wound site. These neutrophils release their own marker and amplify the pro-inflammatory response.

Within two days monocytes reaches the site of injury, and differentiate into macrophages. Macrophages helps in phagocytose debris, pathogens, and neutrophils and produces chemical mediators (TGF-beta and VEGF) which in turn marking the next stage of healing by aggregation of fibroblasts and endothelial cells. This stage takes 72 hours to complete, and injured site becomes erythematous and oedematous.

Proliferative Stage

In proliferative stage clot is replaced by granulation tissues and re-epithelialization occurs. Fibroblasts, keratinocytes, and endothelial cells are present in this stage. Collagen and the extracellular matrix are produced by Fibroblasts. Extracellular matrix, proteoglycans, hyaluronic acid, collagen, and elastin are helps in formation of granulation tissues. Under normal circumstances cytokines and growth factors, interleukins, and angiogenesis factors are active during this time. To fill the wound granulation tissue grows from the base of the wound. Chronic wound forms when there are errors in the granulation tissue formation. Presence foreign body at the site of wound leads to delayed wound healing and persistent granulation tissue.

Remodelling Stage

Remodelling stage is characterized by Apoptosis and the production of new cells. In the final stage of wound healing apoptosis and extracellular matrix degradation, immature type III collagen formation occurs and finally mature type I collagen forms which is essential for scar formation, its strength and integrity. Any errors in this phase of wound healing, leads to hypertrophic scar or keloid formation or chronic wound with persistent granulation tissue.

Due to formation of new capillaries healthy granulation tissue looks pink to red in colour, soft, painless and bumpy. Unhealthy granulation tissues look dark red, bleeds easily, painful, and sometimes covered with shiny white or yellow avascular fibrous tissue, delays healing. Unhealthy granulation tissue suggests infectious process or poor healing should be. After ruling out the infection or treated, few chronic wounds heal with topical steroid application or simple cautery with silver nitrate, but wounds with overlying fibrous tissue will require debridement for the healing.

Utsadana (Stimulating Granulation)

Granulation tissue are histologically characterized by the presence and proliferation of fibroblasts, keratinocytes, endothelial cells, new thin walled capillaries and inflammatory cell infiltration of the extracellular matrix. Granulation are new connective tissue it has following function.

1. Immune: Protects the wound surface from microbial invasion and further injury.
2. Proliferative: Fills the wound from its base with new tissue and vasculature.
3. Temporary plug: Replaces necrotic tissue until replacement by scar tissue.

Utsadana means encouraging granulation tissue formation in depressed wounds. It is indicated for dried wound with deep and poor granulation tissue (parishushkanam gambiranam alpamamsanam vranam)⁵. The process involves various local applications like paste of *Achyranthes aspera* (Apamarga) and *withania somnifera* (Ashwagandha) with ghee or application of medicated ghee (Sarpir lepa) prepared out of *Achyranthes aspera* (Apamarga) and *Withania somnifera* (Ashwagandha). Ghee, mainly because of lipoproteins improves skin elasticity, improves healing process by promoting granulation tissue and reduces scar tissue formation. Intake of proteins from animal source in the form of meat and consuming meat of carnivorous animals (Mamsashinam cha mamsani bhakshayet), and remaining cheerful (Vishuddamanasa), these helps in promotion of growth of healthy granulation tissue for faster healing.

Acharya Vagbhata has mentioned application of paste of *Ficus bengalensis* (Nyagrodha), *Prunus cerasoides* (Padmaka), *Withania somnifera* (Aswagandha), *Sida cordifolia* (Bala) and *Sesamum indicum* (Tila) for the purpose of stimulation of healthy granulation tissue in deep seated dry wounds with poor granulation tissue he also advice to take proteins from animal source in the form of meat and remaining cheerful (Vishuddamanasa)⁶.

In modern medical science, dermal filling gives similar effect but it has side effects like allergic reactions, formation of bumps under skin, bluish discoloration.

Avasadana (Depressing Granulation)

Possible causes of Hyper granulation (excess granulation tissue) are Wound infection, Excess inflammation, Foreign body/material, Physical irritation/friction.

Avasadana means medicinal cauterisation of granulation tissue in excess formation, it is indicated in raised wounds with soft granulation tissue (Utsanna mrdumamsa)⁷. Avasadana is carried out by applying powder of Ferrous Sulphate (Kaseesa) mixed with honey and in case of elevated wounds which are hard (Katina), itching (Kanduyukta) and chronic (Chira) is applied with alkali. (Shodayet ksharakarmana). In this procedure, there is uniform scrapping of over grown tissues up to skin level.

Acharya Vagbhata has mentioned application of buds of *Jasminum grandiflorum* (Jati mukula), Iron Sulphate (Kaseesa), Realgar (Manohwa), *Commiphora mukul* (Pura), *Plumbago zeylanica* (Agnika) for the purpose of Avasadana.

In modern medical science laser skin resurfacing is used for the same purpose that result in other untoward effects like cold sores and fever blisters.

Krishna karma (Inducing Hyperpigmentation)

Among the human race, skin colours are affected by years of population migration and evolutionary change. Skin pigmentation is influenced by multiple factors like environment, weather, clothing choice and trends such as skin tanning or bleaching.

Main factor which decides the human skin colour is melanin, apart from this Local blood supply and pigments such as bile and carotene can contribute to skin tone, melanogenesis produces two types of melanin; eumelanin, which imparts brown-black pigment to skin resulting in darker skin type. Pheomelanin is a red-brown pigment found in people with fair skin type.

Hypopigmented scars lack melanin, for re-pigmentation of a scar presence of hair follicles in wound bed is equally important. These contain 5-6 separate area which acts as melanocyte stem cell reservoir and capacity to provide pigment cells⁸.

Krishna karma is indicated in Durudatvatsuklanam (whitish scars caused by improper healing) The treatment involves application of paste of ash of hoof of domestic and marshy animals mixed with oil prepared from fruit of *Semecarpus anacardium* (Bhallataka) by Adhah patana method⁹. In these procedures hypopigmentation of the skin is removed restoring normal skin complexion.

In modern medical science laser therapy and skin creams are used for this purpose but has side effects which include burning sensation and allergic reactions.

Pandukarma (Inducing Hypopigmentation)

Hyperpigmentation as a complication of skin grafting has been encountered by many surgeons and is a further area in which research is scarce. The phenomenon of post-inflammatory hyperpigmentation can be seen readily in clinical practice, observed as wounds darken as they are healing, and this can be a problem which persists for some time after injury. Post-inflammatory hyperpigmentation may occur after a variety of cutaneous insults such as infection, acne and cutaneous trauma, and leaves the affected individual with a scar which is darker than the surrounding unaffected skin. The mechanisms behind this are not fully understood but may involve activation of melanocytes by inflammatory mediators or reactive oxidative species released by damaged skin.

Pandukarma is indicated in wounds which have turned black due to improper healing (Durudatvatkrishnanam)¹⁰. The treatment involves application of paste of fruits of *Terminalia chebula* (Rohini) soaked in goat's milk for a week. Powder of earthen pot (Kapaalika), Rhubarb (Vidula), root of *Shorea robusta* (Sarja), sulphate of iron (Kasisa), *Glycyrrhiza glabra* (Madhuka) and honey made into paste and applied. Pulp is removed from fruit of *Feronia limonia* (Kapitha) and filled with goat's urine, Iron Sulphate (Kasisa), Rocana, Sulphate of copper (Tutha), Orpiment (Haratala), Realgar (Manashila), bamboo bark, seeds of *Casia tora* (Cakramarda), black antimony (Rasanjana) – kept within the ground under *Terminalia arjuna* (Arjuna) tree for a month, then made into a paste and applied. By this treatment the hyperpigmentation of the skin is restored with normal skin complexion.

In modern medical science laser therapy and intense pulse light treatment are used but has side effects like darker or paler patches and pain during treatment.

Pratisarana (Removing Fibrosed Skin by Rubbing)

Pratisarana refers to application or rubbing the medicated paste to the body parts¹¹. In this procedure, equal quantity of shell of hen's egg (Kukkutandakapalan), *Bryophyllum pinnatum* (Kataka), *Glycyrrhiza glabra* (Madhuka), oyster shell (Samudramanduki), powder of pearl (Manichurna) pounded in Mutra and made into pills which after rubbing is applied as a paste. By this procedure the fibrosed skin is peeled off uniformly without any adverse effects like skin rashes or discolouration.

In modern medical science treatment abrasions and peels have similar effect but has side effects like scarring, infections, skin discolouration.

Romasnjanana (Methods to Stimulate Hair growth)

Hair is a component of the integumentary system and extends downward into the dermal layer where it sits in the hair follicle. Each hair is made up of two separate structures:

1. The hair shaft, which comprises the visible part outside of the skin.
2. The follicle which lies underneath the surface of the skin.

Hair is also made both of living and non-living components below and above the level of the epidermis. Above the level of the epidermis, the hair shaft is a thin, flexible cylinder of non-living, keratinized epithelial cells. Below, it is part of a living hair follicle which enlarges at the base and forms the hair bulb.

The follicle is the primary structure from which hair can grow. The hair bulb is the region of the follicle which actively produces hair. It extends into the dermal layer of the skin and surrounds the dermal papilla, an important structure derived from mesenchyme, made of rich stroma, associated nerve fibres, and a loop of the capillary that supplies nutrients. Vascular supply is provided by small arterioles originating in the subcutaneous fat. The vessels are responsible for nourishing the hair follicle by delivering oxygen and nutrients, eliminating waste, and promoting growth. Subtle hair loss on the lower extremities can sometimes hint at the underlying peripheral arterial disease.

The final hair product that is exposed on the surface of the skin will be composed entirely of keratin. The growth of the hair follicle is cyclical. This cycle can be divided into three phases: anagen (growth), catagen (transition), and telogen (rest).

Anagen growth is the active phase in which the hair follicle takes on its onion-like shape and works to produce the hair fibre. The anagen phase can be further broken down into proanagen and metanagen phases.

Proanagen sees the follicle proliferating hair progenitor cells and begins the process of differentiation.

The new hair shaft appears on the surface of the skin to mark the metanagen phase. The anagen phase as a whole can last for several years.

The catagen phase begins with the end of the anagen phase and is characterized by a transition into quiescence. During this phase, which can last a few weeks, the hair follicle undergoes apoptosis-driven regression and loses about one-sixth of its standard diameter. The formation of a club hair, an important prognostic indicator in assessing hair pathology, also occurs at this time. If many hairs form club hair at once and are subsequently shed, it can give the appearance of thinning. Some conditions that this may occur in include, but are not limited to hypothyroidism, hyperthyroidism, stress, vitamin deficiencies, and after childbirth.

Next is the telogen or resting phase of the hair cycle in which the hair follicle is dormant, and growth of the hair shaft does not occur. About 10% to 15% of all hairs on the body are in this resting phase at any given time and can remain in this state for a variable amount of time depending on the location of the hair - from a few weeks for eyelashes to nearly one year in scalp hair. The exact mechanism that controls passage from one phase into the next is not fully known¹².

Romasnjanana is adopted for hair growth¹³. As per classical reference, burnt ashes of ivory (Hastidantamashi) with the best quality black antimony (Rasanjana) is made into a paste and is applied after mixing with goat's milk. It is told that by this process

hair grows even on palms. Ash made from skin, hair, hoof, horn, bone of four legged animals made into a paste and applied over the affected area. Iron Sulphate (Kasisa) & tender leaves of *Pongamia pinnata* (Naktamalapallava) pounded in juice of pulp of *Feronia limonia* (Kapitta rasa) should be applied as a paste it also promotes hair growth. By these procedures' hair follicles are stimulated uniformly all over the surfaces and there are very least chances of reoccurrence of baldness.

In modern medical science, hair transplant technique is used for this purpose but it has side effects like bald patches, swelling, itching and scabbing.

Lomapaharana (Depilation)

Lomapaharana is indicated in wounds which do not heal properly due to presence of hairs¹⁴. Excessive hairs prevent complete healing of ulcer, here hairs are removed with knife (Kshura) or scissors (Kartari) or forceps (Samdamsha). Conch shell powder (Shankachurna) (2 part) and orpiment (Haratala) (1 part) to be pounded in sour gruel (Shukta) and later made into paste and applied over affected areas. *Semicarpus anacardium* (Bhallataka taila) along with *Euphorbia nerifolia* (Snuhi ksheera) applied as paste, Ashes of *Musa paradisiaca* (Kadali) as well as *Oroxylum indicum* (Deerga vrunta) Orpiment (Haratala) Rock salt (Saindhava lavana) seeds of *Prosopis cineraria* (Shami) pasted with cold water and applied, the ashes collected after burning the tail of Domestic lizard (Agara godhika), *Musa paradisiaca* (Ramba), Orpiment (Haratala) seeds of *Balanites aegyptiaca* (Ingudi) mixed with oil and water and dried in sun made into paste and applied. By these procedures unwanted hair is removed easily without pain and discomfort. Further discolouration of the skin can be prevented.

In modern medical science laser treatment and hair removal creams are used and has side effects like itching, redness, swelling, change in skin pigmentation, obvious pain during treatment, and scabbing.

CONCLUSION

Acharya Sushruta has given great emphasis on the Vaikrutapaha chikitsa for cosmetic repair of the formed scar in the process of healing and to minimize the cosmetic disfigurement. When these measures are employed which results in cosmetically acceptable scar hence Vaikrutapaha chikitsa has a great role in curative as well as cosmetic aspect in Vrana chikitsa. Now it's a challenge for present situation to explore it fully and employ these techniques in managing the Vrana in view of cosmetic importance and resolving its lacunas by suitable methods of standardization. There is no doubt that if these procedures are properly adopted in practice it could bring lot of positive approach among the needy, as there is demand for natural method and principles in keeping the skin beautiful by minimising abnormalities or disfigurement which are resulted by Vrana.

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How to cite this article:

Yashwanthakumar H and Anand Katti. A review on vaikrutapaha chikitsa in the management of Vrana (Wound). J Pharm Sci Innov. 2021;10(6):141-144. <http://dx.doi.org/10.7897/2277-4572.106220>

Source of support: Nil, Conflict of interest: None Declared

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