



## **Concept of Vaikritapaham for the Management of Scar in Ayurveda – A Critical Review**

**Pavithra Jaivarshaa G V<sup>1\*</sup>, Devyani Dasar<sup>2</sup>, Akshay Kumar<sup>3</sup> and Shubham Biswas<sup>4</sup>**

<sup>1</sup> PG Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod (H), Datta Meghe Institute of Medical Sciences, Wardha 442001,

<sup>2</sup> Associate Professor & HOD, Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre. Salod (H) Wardha, Datta Meghe Institute of Medical Science, 442001,

<sup>3</sup> PG Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod (H), Datta Meghe Institute of Medical Sciences, Wardha 442001,

<sup>4</sup> PG Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod (H), Datta Meghe Institute of Medical Sciences, Wardha 442001

**Abstract:** A wound has six root causes, and eight primary locations, characterized by signs of five, prescribed with sixty therapeutic measures and management by four limbs of treatment. The aesthetic management of wounds and scars has been an extensive concept from ancient days to the current surgical practice. Ayurveda is elemental in boundless cosmetic measures for people spanning centuries, with the idea of *vaikritapaham* commanding wound management in the branch of *Shalya Tantra*. This study aimed to explore the concept of *vaikritapaham*, managing scar and granulation issues in Ayurveda. The method followed for this review was a thorough analysis of *brihatrayees* and their commentaries and reference from various research articles on scar management in Ayurveda. It was found that in *Sushruta Samhita*, the concept of *vaikritapaham* as the anti-scar measure is mentioned in *sapta upakrama* of *vranasopha* and various concepts like *Utsadana* and *avasadana* for stimulating and depressing granulation, *mrdukarma* and *darunakarma* for hardening and softening the woundksarakarma for improper granulation, *krsnakarma*, *pandukarma* and *pratisarana* for discolouration of the skin, *romasanjanana* and *lomapaharana* for repilatory and depilatory measures respectively have been mentioned in *shasti upakrama* of *Vrana*. *Charaka* and *Vagbatta* have described *lepas* for discolouration issues in managing *Vrana*. The research thoroughly reviewed the concept of *vaikritapaham*, scar management and measures for granulation issues in Ayurveda.

**Keywords:** *Vrana vaikritapaham, shasti upakrama Sushruta, Utsadana, avasadana mrdukarma darunakarma, ksarakarma, krsnakarma, pandukarma, pratisarana, romasanjanana, lomapaharana*

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### **\*Corresponding Author**

**Pavithra Jaivarshaa GV , PG Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod (H), Datta Meghe Institute of Medical Sciences, Wardha 442001**

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## I. INTRODUCTION

The history of humanity is a history of repeated wars and destructions followed by brave reconstructions and restorations. Injury and wound management have been a significant share of the field of surgery and development, from healing to medicine. Scars and granulation issues are part of wound healing, but efficient techniques and skills can avoid or minimize the scars, and supportive measures can give aesthetic healing. Scar remodelling and standards for efficient granulations in major wounds have seen celestial advances in modern medicine ranging from topical applications to cosmetic surgical interventions. A surgeon's primary responsibility is to cure wounds as soon as possible without complications and recurrence. In Ayurveda, there is a unique concept called *Roga* and *Rogi* concept. Here *yoga* is '*Vrana*', and the patient having *Vrana* is called '*Vranitha*'. *Vrana* management needs consideration of both *Vrana* and *Vranitha* simultaneously. This is the most critical aspect of wound management in Ayurveda. Scars remain a physical sight to remind the injury and can leave psychological stress in people who have undergone significant trauma. Therefore, wholesome and sensitive management of wounds stays a primary focus. The concepts of *Vrana* and management of *Vrana* share a substantial part of *Sushruta Samhita*. Tracing back to the ayurvedic fundamentals, one can understand that scar remodelling, known as *vaikritapaham*, is one of the ancient concepts of *Vrana chikitsa*. *Vrana* is so-called as it covers the site, and the scar, even after healing, does not disappear till the person lives.<sup>1</sup> Ulcer, which has a ground matrix healed up, knotless, unswollen, painless and with a colour similar to skin and even texture, should be seen as a well-healed wound. On the other hand, an ulcer, which is pure, clean, and uninhabited by three *doshas*, has dark margins and granulating tissues. So it is even with skin, free from pain and discharge.<sup>2</sup> The colour of skin post-healing and granulation during the healing has been given importance as assessing factors for proper healing in the last stage of wound healing. While describing the extensive sixty-odd procedures for a potent *Vrana ropana*, Acharya *Sushruta* has mentioned concepts like *Utsadana* and *avasadana* for stimulating and depressing granulation, *mrdukarma* and *darunakarma* for

hardening and softening the wound, *ksarakarma* for improper granulation, *krsnakarma*, *pandukarma* and *pratisarana* for discolouration of the skin, *romasanjanana* and *lomapaharana* for respiratory and depilatory measures respectively have been mentioned in *shasti upakrama* of *Vrana*. *Charaka* and *Vagbatta* have described *lepas* for discolouration issues in managing *Vrana*. This study deals with the concept of *vaikritapaham* in the healing of wounds, that is, the management of scar and granulation issues in Ayurveda, as mentioned in *Sushruta Samhita*.

## 2. MATERIALS AND METHODS

The method followed for this was a thorough analysis of *Sushruta Samhita* and commentaries of *Sushruta Samhita*, various review articles, including concepts of Acharya *Charaka* and *Vagbhatta*.

### 2.1 Observations

The concept of *Vrana* is pervasive in the branch of shalya tantra. It causes damage and discolouration to the body part, *Varna Gaatravichurnane*, *Varnayateeti*. The word 'VRANA' comes from the verb 'vrana gatravichurnane'.<sup>3</sup> Acharya *Sushruta*, the father of Indian surgery, gave the importance of *Vrana* at the onset of the text while explaining the definition of Shalya Tantra right from the aetiology, various pathogenesis of types of wounds, descriptions of the kinds of discharges, shapes, clinical features and classification as treatable and untreatable injuries, and has given a great emphasis on wound management too. The management line is the same, except for the beginning stage, even if there are two sorts of *Vrana*: *Nija* and *Agantuja*. If *Agantuja Vrana* does not heal within seven days, it is still treated similarly to *Nija Vrana*. *Sushruta* has comprehensively described how *Sharirika Vrana* was managed, beginning with the *Vrana Shotha* stage. *Sutra-sthana* has descriptions under seven significant themes, and in *Chikitsa*, he expanded these seven concepts into sixty other types. He also focuses on a diet and routine the injured should follow to heal quickly and prevent problems.

**Table 1. Shada Rasa's role in wound healing is as follows:**<sup>4</sup>

Madhura Rasa	possessing therapeutic powers similar to those of Sandhanakar and Balkrita
Amla Rasa	Forms Puya (pus) and causes Vidaha (burning feeling) in the wound
Lavana Rasa	Due to Vishleshana and Lekhana Karma, she performs the role of <i>Vrana Shodhana</i>
Katu Rasa	which possesses qualities similar to those of <i>Vrana Shodhana</i> <i>Kushthaghina</i> , <i>Krimighana</i> , and <i>Lekhana</i>
Tikta Rasa	It strengthens Twak and Mamsa Dhatus and dries up Kapha
Kashaya Rasa	Possesses <i>Kleda Shoshaka</i> and <i>Vrana Shodhakaa Ropak</i> characteristics

He has described *sapta upakrama* in the management of *Vrana Sopha* from *vimlapanam* to *vaikritapaham*, which is scar remodelling and management in Ayurveda.<sup>5</sup> In *chikitsa sthana*, he has explained *vrana chikitsa* as *shasti upakrama* explaining sixty management protocols for the wound in a circumcised manner. It includes *ahara* and *vihiara* indicated for wound healing, methods to accelerate the path of an injury from *ama avastha* to *pakwa avastha* in the inflammatory phase of the damage, surgical interventions for impairment, and various forms of topical applications for multiple stages of impairment, systematic measures for *dosha-dushya* balance. It covers the *purva karma*, *Pradhan karma* and *paschat karma* intended for each type of wound. One of the significant aspects is the explanation of measures like *utsadana*, *avasadana* for stimulating and depressing granulation,

*mrdukarma* and *darunakarma* for hardening and softening the wound, *ksharakarma* for improper granulation, *krsnakarma*, *pandukarma* and *pratisarana* for discolouration of the skin, *romasanjanana* and *lomapaharana* for respiratory and depilatory measures. This covers the broad concept of scar remodelling and cosmetic management to achieve wholesome wound healing.<sup>6</sup> *Charaka* has also given an extensive description of *Vrana* and has consistently described measures like *utsadana*, *avasadana*, *varnya*, *ropana*, *katinyakara* and *mrudukara lepan* and *dhupana* recipes, standards for *roma rohana* for aesthetic healing of the wound.<sup>7</sup> *Vaghbatta* has mentioned *lepa* formulations for less hypo and hyper granulations and measures like *Roma Sanjana*, *twak shuddikara*, *twak shuddikara*, and topical applications for healthy *ropana karma*.<sup>8</sup>

- utsadana – Stimulating granulation
- avasadana - Depressing granulation,
- mrdukarma – Hardening of wound
- darunakarma - softening the wound
- krsnakarma , - Blackening measures
- pandukarma – Whitening measure
- romasanjanana – respiratory measures
- lomapaharana - depilatory measures

### 3. UTSADANA

Sushruta has mentioned *utsadana* in *shasti upakrama*. These measures increase healthy granulation in dried, deep-seated wounds and lack healthy granulation. Patients are asked to eat the meat of carnivorous animals, remain free from stress and apply *lepas* with *ghrita* processed with drugs like *ashwagandha* and *apamarga*. <sup>9</sup>Charaka has advised using *lepas* with *jeevaneeya*, *brimhaniya* and *stanyani dashemani* to induce healthy granulation<sup>10</sup> Vaghbata has mentioned massaging the wound with the paste of drugs of *nyagrodadhi* and *padmakadi gana*, *ashwagandha*, *bala* and *tila*.<sup>11</sup>

### 4. AVASADANA

This is a measure used for depressing excessive granulation tissues. Wounds with soft and raised granulation tissues are treated with honey and powders of *kasisa*, as mentioned by Sushruta. Charaka advises using nodes of the *bhurja* plant, *ashma kasisa*, purgatives like *Guggulu* and stools of *kapota* and *kalavinka*. These help in the removal of excessive granulation.<sup>12</sup> Wounds with raised granulation associated with itching, hardness and chronicity are to be cleaned, and application of *kshara* is indicated. Dahana, pachana, darana, vilayana, sodhana, ropana, shoshana are the *Karmas* of *kshara*. With *lavana*, *tikta rasa*, *ushna veerya*, *Ruksha* and *Tikshna Guna* and *Katu Vipaka*, the three doshas are alleviated by prepared *kshara* is a combination of several medications. Due to its *Stambhana* property, it stops bleeding and kills worms (larva), *ama*, *kapha*, *kustha*, *visa*, and *meda*. Numerous *agneya* medications are included during the preparation process, which is *katu* in *rasa*, produce heat, enter the most profound site (for *tiksna guna*), ensure suppuration (pachana), liquefaction of diseased tissues (vilayana), improve tissue repair and granulation, and promote suppuration (pachanga).<sup>3</sup> Vaghbata has indicated the use of buds of *jati*, *manohna*, *pura* and *agnika* in addition. 14A randomized control trial was done with *Madhu* and *kasisa yukta kalpa* for *avasadana karma* in hyper granulation of post-operative fistula patients treated with *kshar sutra*. Excessive secretions caused by chronic irritation, sensitivity, improper preparation, and poor ligation technique, all of which are linked to *Ksharsutra*, are the most likely causes of hyper granulation tissue formation in the fistula in ano. *Utsanna Mrudu Vrana Maansa* (Hyper Granulation) in *Bhagandara* (fistulain-ano) is common. The study concludes that both are effective, with the latter having significantly high efficacy.<sup>15</sup> In Ayurvedic literature, the use of *Kasisa* in chronic wounds with erupted wound edges and discharge has been postulated. The ferrous sulphate acts as a vasoconstrictor due to its astringent property, thus reducing the size of hyper granulation tissue.<sup>16</sup> Honey is a hyperosmolar medium, forestalling bacterial development. As a result of its high consistency, it frames an actual hindrance, and the presence of the protein catalase gives honey cell reinforcement properties. Honey has been demonstrated to be helpful in anticipation of hypertrophic scarring and post-

consumer contractures. Honey is an exceptionally compelling specialist for dressing split-thickness skin grafts.<sup>17</sup>

### 5. MRDUKARMA

Sushruta opines this measure's use for challenging wounds, devoid of granulation and vitiated by *vata*. He indicates blood-letting for injuries associated with *vata* and *rakta* while *snehana* and *pariseka* with *vata hara ushna dravyas* for *vata* and *kapha*. He also advises tight bandaging to promote softness and rapid healing.<sup>18</sup> Charaka describes fumigation of hardened and dry wounds with fumes of ghee, bone marrow and muscle fat to soften the tissues and promote healthy granulation. When the injury is associated with severe dryness and pain, topical applications of ghee with barley flour or processed ghee with *jivaniya dashemani dravyas*, *payasa*, *mudga* and *shastika lepa* are indicated with *ghrita*.<sup>19</sup>

### 6. DARUNAKARMA

According to Sushruta wounds with excessive soft granulation tissues and are unhealthy, powders of equal quantity of leaves of *dhava*, *priyangu*, *Asoka*, *Rohini*, *Triphala*, *dhataki Pushpa*, *rodhra* and *sarjarasa* are to be mixed and dusted in dry form on the soft granulation tissues<sup>20</sup> Charaka describes the fumigation of the wound with aromatic drugs and heartwood of aromatic plants to harden the tissues and promote healthy granulation. Likewise, applying *lepa* made with *Triphala*, *lodhra*, *khadira* and roots of *nyagrodha* helps in healthy granulation.

### 7. KRSNAKARMA

Blackening measures are employed in white scars caused by improper wound healing. *Bhallataka* nuts impregnated with cow urine are kept in milk. Later oil is extracted and mixed with powders of burnt hoofs of domestic and marshy animals and applied topically to blacken the scar. This is explained by Sushruta.<sup>21</sup> Charaka emphasizes using the *bhasma* of *Kasia* and *loha* mixed with the paste of flowers of *Triphala*.<sup>22</sup>

### 8. PANDUKARMA

The whitening measure is used for wounds with hyperpigmentation due to improper granulation and scar formation. Sushruta describes the usage of fruits of *Rohini* immersed in cow's milk for a week as a paste, powders of *sharava*, roots of *vidula*, *sarja*, *kasisa* and *madhuka* mixed with honey and used as *lepa* over the scar. He also delineated the use of *kapittha* stuffed with *aja mutra*, *kasisa*, *tuttha*, *haratala*, *manahsila*, *vamsha*, *chakramarda* and *rasanjana* buried under the *arjuna* tree for a month. He explains that hen's egg shells are powdered and blended with *kataka*, *madhuka* (*glycyrrhiza glabra*), *samudra* *manduki* (*jalashukti* or *muktashukti*), and *manichurna* (*sphatika churna*) to make a *gutika*, which is used for scraping over the site where skin colour normalisation is required.<sup>23</sup> For the prevention of scars on the skin surface,

Manashiladi Lepa is described in 'Rasa Tantra Sara Va Siddha Prayoga Sangraha.' Following a clinical evaluation of treatment in a Caesarian segment wound, it is reasonable to conclude that Manashilaadi Ointment effectively prevents scar formation without causing any adverse effects.<sup>24</sup> In equal parts, the shell of a hen's egg, katak, madhuk, sea-oyster and crystals (pearl according to Jejjata and Brahmdev) should be mashed and pasted with cow's urine and fashioned into boluses that should be spread over the cicatrix to restore normal skin pigmentation. Other references are also found for restoring back normal skin pigmentation. Vaghbata mentioned the application of the paste of kaliyaka, lata, amrasthi, padmaka, manji sta, and parada ground with gomaya for restoring normal skin tone and colour of the scar after healing. Dhyamaka (*Cymbopogon martinii*), ashwathamula (*Ficus religiosa*), nichulamula (*Barringtonia acutangula*), Laksha (*Laccifer lacca*), gairika (Red Ochre), Hema, amruta, and Kasia (green vitriol) blended and used as lepa for application by Acharya Charaka. Application of khararika tuttha as lepa restores normal pigmentation.

## 9. ROMASANJANANA

These are measures used as repilatory agents over scars. Ivory ashes and pure *rasanjana*, mashed and pasted with goat milk, should be applied to the area where hair growth is desired. This paste is potent enough to cause hair growth, even in the palm. Other measures by Sushruta are to use a pulverised compound made up of the cremated ashes of bones, nails, hairs, skin, hoofs, and horns of any quadruped to a section of the body that had previously been anointed with oil, resulting in the appearance of hair in that area. Finally, the plaster made of iron sulphate and Karanja leaves mixed with *kapittha swaras* and plastered can induce hair growth. Vaghbata explained the use of *hasti danta mashi* combined with *rasanjana* for promoting hair growth over the scar.<sup>25</sup> A standard measure mentioned by all three acharyas is applying the paste of ash of nails, hair, bones, skin, horn and hoofs of quadrupeds added with oil as a repilatory agent.

## 10. LOMAPAHARANA

In wounds that do not heal properly due to the presence of hairs, the hairs must be removed with razors, scissors, and forceps. The powdered conch shell in two parts, one part of orpiment, pounded with sour gruel and applied to part acts as a depilatory measure. *Bhallataka taila* mixed with the latex of *snuhi* is another measure. Ashes of *kadali*, seeds of *Sami* mixed with orpiment and *saindhava lavana* pounded in cold water remove hair and accelerate wound healing, according to Sushruta. Seeds of *ingudi* burnt and mixed with *kadali*, orpiment and the tail of house lizards destroy follicles over scar when applied topically.<sup>26</sup>

## 11. DISCUSSION

After an accidental or endogenous injury, the skin undergoes a wound-healing process that creates a mature scar.<sup>27</sup> Generally, periods of wound recuperating are arranged into three phases, the inflammatory, the proliferative and the remodelling phase. The essential periods of wound mending incorporate hemostasis and irritation, trailed by multiplication and movement of dermal and epidermal cells and the framework combination. At last, remodelling and differentiation give the remaking of tissue respectability, similar to the target of wound healing. Every year, millions of patients throughout the world are left

with scars as a result of trauma or surgery. Hypergranulation (or over-granulation) produces more granulation tissue than is required to compensate for the tissue loss caused by skin injury or trauma. Hypergranulation is a common but not uncommon complication of wounds. The lack of trustworthy evidence on the subject has led to many behaviours, some of which cause pain or discomfort and others which may impede healing. Inflammation, proliferation, and remodelling are the three steps that make up the typical wound-healing process. This process is sometimes disrupted, resulting in hypertrophic or keloid scarring.<sup>29</sup> This distinction of kinds and identification of contributory elements, combined with an awareness of natural healing processes, goes a long way towards identifying effective therapy pathways and justifying treatment decisions, one of which is to wait and watch. With proper surgical technique and wound care, clinicians can reduce the chance of these pathological scars forming. If pathological scars do develop, should refer for patients for treatment, which usually involves topical or intralesional corticosteroids. Phototherapy, radiation, or surgical resection may be used to treat pathological scars in resistant cases.<sup>30</sup> Ayurveda is a science that clarifies both physical and psychological well-being. Even though mentioned in various orders, the concepts and the choice of drugs are highly similar in all three *Samhitas*, with extensive descriptions in *Sushruta Samhita*, the bible for surgery in Ayurveda. *Bhrajaka Pitta* is responsible for manifesting our colour in the *Avabhasini* (upper layer of the skin) *Tvacha*. The *Bhrajaka Pitta* governs the colour and complexion. Qualitative and quantitative variations of *Bhrajaka Pitta* or *Bhrajaka agni* will change an individual's colour and complexion. This may be influenced by several factors, including diet and lifestyle, exposure to extremes of climate, nature of trauma and intrinsic factors of wound healing. These influencing factors vitiate Pitta, which leads to its increase or decrease. The *vayu* and *kapha* also, when vitiated, will have a bad influence on the *Bhrajaka Pitta* and cause a Blackish and White appearance of the skin, respectively. A clean wound heals faster than a contaminated wound and leaves a smaller scar. Healing an infected wound is difficult, especially in the case of vascular ulcers, tubercular ulcers, tropical ulcers, and other types of ulcers. Although many workers have already completed numerous tasks, there are restrictions, such as cost-effectiveness, poor material availability, and modality in rural locations. In India, about 80% of the population lives in rural areas with low sanitation and nutrition. These people's wounds take longer to heal because they become infected due to their neglect and lack of healing elements, resulting in permanent scars such as keloids and hypertrophic scars. Scar remodelling is gaining significant attention in the current sophisticated life. It is appreciated that the concept of scar remodelling, *vaikritapaham*, can be traced back to many formulations and concepts in *brihatrayee*. Western medicine has reached heights in treating these cosmetic issues with silicone gel sheeting, topical application of contractures gel, tretinoin, calcipotriol, vitamin E, Imiquimoid, Mederma, use of a pulsed eye or non-ablative fractional LASER, Mesenchymal stem therapy, pressure therapy, and surgical interventions like tension-free primary closure, beak plasty, V-Y advancement flaps, dermabrasion and various other management protocols for scars and cosmetic satisfaction with their pros and cons.<sup>31</sup> The numerous measures featured in *vaikritapaham* are summed as *Utsadana*, which signifies elevation, as shown in *Alpamamsi Vrana*, *Vataja*, *Vata-Pittaja*, and *RukshaVrana*, among others. *Aalepa* of *Vataghna Dravyas* with *Ghrita* is used in this method for *Utsadana*. The purpose

of Utsadana is to raise the beds and cavities of deep Vranas. Avasadana is a method of decreasing the Unnatmamsi Vrana that involves using Avasadan medicines and Madhu. Mrudukarma uses lotions, ghrita, and other softening methods in Vataj, Kathina, and Alpamansi Vranas. Darunkarma is an efficient hardening method in Mrudu Vrana. This is accomplished through the employment of Kashayarasatmaka Dravyas. Chemical cauterization is used for the Shodhana of Chirakari, Kandu, Kleda, and Sravayukta Vrana in Ksharakarma. Ushna Gunatmak Kshara is employed for this Teekshna application. Krsnakarma is blackening white cicatrix with medicinal drugs such as Bhallatak Taila. In contrast, pandukarma is the restoration of natural and healthy pigmentation of surrounding skin with medicinal medications applied to black cicatrix. Using medicinal Churna and lepas, Pratisarana is used to help a discoloured scar return to its normal colour. Romasanjanana is a method for regrowing hair on a hairless scar. Romashatana is a upakrama for eliminating Roma from non-healing Vrana and romavyapta. It is performed through the use of Yantra and a variety of lepas.<sup>32</sup>

## 12. CONCLUSION

The current study highlighted various non-invasive

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- Suresh YY, Prashanth BK, Rao R, Kekuda P. Clinical Evaluation of Modified Manashiladi Lepa in preventing treatments for scar management in Ayurveda. These measures can also be put into everyday practice, as many drugs mentioned are in daily routine. Efficient use of shasti upakrama in wound management and appropriate vaikrtapaham measures for a scar can bring Ayurveda to par with modern cosmetic surgical advances. With gaining popularity in aesthetic approach to wound healing, these non-invasive and topical applications of medicines and potential cauterizing agents are the need of the hour. Extensive research for efficient applicability and significant topical mode of delivery of the drugs is the scope for further studies.

## 13. AUTHORS CONTRIBUTION STATEMENT

Dr Devyani Dasar conceptualized and guided me throughout the whole compilation of the review article; Dr Akshay Kumar helped curate data and gave necessary inputs. Dr Shubham Biswas contributed to designing the manuscript.

## 14. CONFLICT OF INTEREST

Conflict of interest declared none.

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