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CASE STUDY

Vranadhoopan Karma (Medicated Wound Fumigation Therapy) in the Management of Tropical Ulcer: A Case Report on Traditional Healing Practices

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ABSTRACT
Chronic tropical ulcers present a persistent therapeutic challenge due to poor response to conventional treatments. This case study evaluates the efficacy of Vranadhoopan Karma, an Ayurvedic fumigation therapy, in promoting wound healing. A 45-year-old female with a chronic, non-healing ulcer on the right heel, unresponsive to antibiotics and antiseptic dressings, underwent daily fumigation for two weeks using a blend of Gaur Sarshap (Brassica campestris), Vacha (Acorus calamus), Nimba (Azadirachta indica), and Guggulu (Commiphora mukul). Clinical assessments showed marked improvements, including significant pain relief, reduced ulcer size, enhanced granulation tissue formation, and epithelialization. Notably, Interleukin-6 (IL-6) levels decreased from 92.900 pg/mL to 6.20 pg/mL, reflecting a reduction in systemic inflammation. No adverse effects or secondary infections were noted. This case suggests that Vranadhoopan Karma may offer a safe and effective alternative for managing chronic tropical ulcers, supporting its potential for broader clinical application pending further studies.
Keywords *Tropical ulcer, Vranadhoopan Karma, Wound healing, Traditional medicine.*

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INTRODUCTION

Tropical ulcers are chronic, necrotizing skin lesions commonly seen in tropical and subtropical regions.The trophic ulcers are usually presented in the form of diabetic ulcer, leprotic ulcer, and pressure ulcer. The usual site for ulceration in trophic ulcer is the bony prominence on body part devoid of sensation. The chronic wounds management in health-care setting have significant impact on the patient's physical, mental, and financial health. In trophic ulcer management factors such as cause of ulcer, its location, size, and duration should be considered. Infection in such trophic ulcer leads to increase disease activity results delayed wound healing. Thus, a study was designed with aim to find relation between location of trophic ulcer and its infection status.[1] They are often caused by polymicrobial infections and are exacerbated by poor hygiene, malnutrition, and underlying systemic conditions such as diabetes or immune deficiencies. Standard treatment involves antibiotics, debridement, antiseptic dressings, and sometimes skin grafting. However, chronic ulcers often exhibit poor healing responses and may become refractory to treatment, necessitating alternative therapeutic interventions. Vranadhoopan Karma is a traditional Ayurvedic technique that utilizes the medicinal properties of herbal fumigation to promote wound healing. The therapy involves exposing the ulcer to therapeutic smoke generated by a combination of antimicrobial and wound-healing herbs. This technique has been described in classical Ayurvedic texts as an effective measure to disinfect wounds, reduce infection, promote granulation tissue formation, and expedite healing.[2]

MATERIAL AND METHODS

Patient Information

A 45-year-old female patient presented to the Shalya Tantra department with a chronic, non-healing ulcer over the right heel, associated with persistent pain and purulent discharge. The ulcer had been present for approximately two years and showed no significant improvement despite prolonged conventional management, including multiple courses of antibiotics and regular antiseptic dressings. There was no history of diabetes mellitus, hypertension, peripheral vascular disease, tuberculosis, or any other systemic illness known to impair wound healing. The patient also had no relevant family or genetic history, and her psychosocial background was unremarkable, with no occupational or lifestyle factors contributing to delayed healing.

On local examination, a single ulcer was observed on the right heel with irregular margins, slough at the base, unhealthy granulation tissue, purulent discharge, and mild surrounding induration with tenderness. No features suggestive of osteomyelitis or regional lymphadenopathy were noted. Routine hematological investigations were within normal limits. Based on the chronicity, local signs of infection, and poor response to standard therapy, the condition was clinically diagnosed as a tropical ulcer, corresponding to Dusta Vrana in Ayurvedic terminology. The patient was planned for management with Vranadhoopan Karma (Medicated Wound Fumigation Therapy) along with standard wound care. Written informed consent was obtained before initiation of treatment, and patient confidentiality was strictly maintained throughout the documentation and reporting process.

Clinical Findings

On local examination, a single chronic ulcer was present over the right heel, measuring approximately 5 × 5 cm. The ulcer had irregular margins with slough at the base and unhealthy granulation tissue. Moderate purulent discharge with mild foul odor was noted. The surrounding skin showed erythema, induration, and tenderness, suggestive of localized inflammation. No active bleeding was observed. There was no evidence of sinus formation, exposed bone, or features suggestive of deep tissue or bony involvement. Regional lymph nodes were not enlarged, and the patient did not exhibit systemic signs of infection such as fever or malaise.

Laboratory Tests

Laboratory investigations including Complete Blood Count (CBC) *(Hemoglobin: 12.4 g/dL; Total Leukocyte Count: 6,400 cells/mm^3; Platelet count: 250,000/mm^3)*, Bleeding Time *(2 minutes 30 seconds)*, Clotting Time *(4 minutes 30 seconds)*, Random Blood Sugar *(120 mg/dL)*, and urine routine and microscopic examination *(no pus cells, sugar, or epithelial cells detected)* were performed using standard laboratory methods and were found to be within normal reference limits. Serological tests for HIV, HBsAg, and VDRL were non-reactive. Serum Interleukin-6 (IL-6) was estimated using the Enzyme-Linked Immunosorbent Assay (ELISA) method and was found to be elevated at 92.900 pg/mL *(normal reference range: <7 pg/mL)*, indicating an ongoing inflammatory response associated with the chronic non-healing ulcer.

Timeline

The ulcer first appeared approximately two years prior to presentation and was managed with repeated courses of antibiotics and regular antiseptic dressings during this period; however, no sustained improvement in wound healing was observed. Following diagnostic evaluation, the patient was initiated on *Vranadhoopan Karma* as the primary therapeutic intervention. The therapy was administered once daily for a total duration of 20 days under aseptic precautions.

During the first 5 days, the patient reported a noticeable reduction in pain and local discomfort, with a decrease in purulent discharge. By days 6–10, improvement in wound hygiene was evident, characterized by reduced slough and early healthy granulation tissue formation. Between days 11–15, a marked reduction in surrounding erythema and induration was observed, along with a gradual decrease in wound size. By days 16–20, the ulcer showed significant healing, with well-formed healthy granulation tissue, minimal discharge, and substantial contraction of the wound margins. Overall, the 20-day treatment period demonstrated a progressive and sustained healing response following failure of long-term conventional therapy.

Diagnostic Assessment

A thorough diagnostic evaluation was conducted to assess the patient's condition and identify factors contributing to delayed wound healing. Routine hematological and biochemical investigations revealed values within normal reference limits, including Complete Blood Count *(Hemoglobin: 12.4 g/dL; Total Leukocyte Count: 6,400 cells/mm^3; Platelet count: 250,000/mm^3)*, Random Blood Sugar *(120 mg/dL)*, Bleeding Time *(2 minutes 30 seconds)*, Clotting Time *(4 minutes 30 seconds)*, and urine routine and microscopic examination *(no pus cells, sugar, or epithelial cells detected)*. Serological investigations for HIV, hepatitis B surface antigen (HBsAg), and Venereal Disease Research Laboratory (VDRL) test were

performed to exclude underlying infectious etiologies and were found to be non-reactive. In contrast, inflammatory marker analysis demonstrated a markedly elevated serum Interleukin-6 (IL-6) level of 92.900 pg/mL *(normal reference range: <7 pg/mL)*, estimated by the Enzyme-Linked Immunosorbent Assay (ELISA) method, indicating a persistent inflammatory state. Based on the chronic clinical presentation, normal systemic investigations, and significantly elevated IL-6 levels suggestive of sustained inflammation, the patient was diagnosed with a chronic tropical ulcer with persistent inflammation, corresponding clinically to Dusta Vrana, necessitating targeted therapeutic intervention to control inflammation and promote wound healing.

Therapeutic Intervention

Vranadhoopan Karma is performed using Gaur Sarshap (Brassica campestris), Vacha (Acorus calamus), Nimba (Azadirachta indica), and Guggulu (Commiphora mukul) for their antimicrobial and wound-healing properties. The herbs are dried, purified, and crushed into a fine powder. The mixture is ignited in a controlled manner using a Dhoopan Yantra, ensuring proper ventilation. The patient is positioned comfortably, maintaining a one-foot distance between the wound and the fumigation source. Medicinal fumes are directed toward the wound for 10–15 minutes per session, once daily for two weeks. After the procedure, the wound is allowed to absorb the medicinal effects, and if required, a sterile dressing is applied. The wound is monitored for improvement, ensuring optimal therapeutic benefits without causing tissue damage.

RESULT

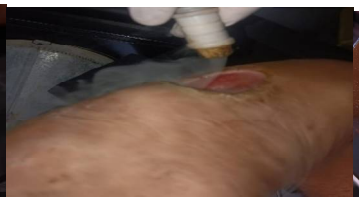
The patient demonstrated a significant and progressive clinical response following treatment with Vranadhoopan Karma, with evident improvement across all phases of wound healing. During the initial treatment sessions, there was a rapid reduction in pain and purulent discharge, indicating effective control of the prolonged inflammatory phase. This led to improved patient comfort, enhanced mobility, and better tolerance of wound care procedures.

As treatment progressed over the two-week period, clear transition from the inflammatory phase to the proliferative phase of wound healing was observed. The wound bed showed a marked reduction in slough, followed by the appearance of healthy, well-vascularized granulation tissue. Surrounding erythema, induration, and tenderness gradually subsided, reflecting resolution of local inflammation.

By the end of the treatment period, the ulcer demonstrated significant contraction in size with progressive epithelialization from the wound margins, indicating advancement into the maturation phase of healing. The wound surface appeared clean with minimal discharge, healthy margins, and restoration of normal surrounding skin texture.

Biochemically, a notable improvement in inflammatory status was documented. Serum Interleukin-6 (IL-6) levels decreased markedly from 92.900 pg/mL at baseline to 6.20 pg/mL post-treatment, approaching normal reference values *(<7 pg/mL)*. This reduction correlated well with clinical findings and confirmed effective modulation of persistent systemic inflammation. The treatment was well tolerated, with no adverse reactions or secondary infections observed during therapy or follow-up, supporting both the safety and therapeutic efficacy of medicated wound fumigation in the management of chronic tropical ulcers with persistent inflammation.


Figer 1. Ulcer Before Treatment


Figer 2. Wound fumigation


Figer 3. After Treatment

DISCUSSION

Acharya Sushruta has described Shashti Upakramas—sixty treatment modalities for the management of *Dushta Vrana* (chronic wounds). Among these, Vranadhoopan (herbal wound fumigation) holds special importance due to its dominance of ***Agni*** and *Vayu Mahabhuta*, making it highly effective in wounds that are contaminated, foul-smelling, exudative, or associated with infection. It performs *Shodhana* (cleansing), *Krimighna* (antimicrobial), *Durgandha Nashaka* (deodorising), and *Ropana* (healing) actions. In a modern perspective, *Vranadhoopan* can be considered a natural wound fumigation therapy using volatile medicinal compounds. *Vranadhoopan* therapy is to enhance epithelial regeneration and promote healing. *Vranadhoopan* was then performed using an herbal combination of *Nimba*

(*Azadirachta indica*), *Vacha* (*Acorus calamus*), *Gour Sharshapa* (*Sinapis alba*), *Guggulu* **(***Commiphora mukul***).**

Table 1 Probable Mode of Action of Each Ingredient of Vranadhoopan

Herb	Botanical Name	Ayurvedic Properties	Probable Modern Action
Nimba [4]	*Azadirachta indica*	Tikta-Kashaya rasa, Laghu-Ruksha guna, Sheeta virya	Exhibits antibacterial, anti-inflammatory, antioxidant, and wound-healing effects. Helps in de-sloughing, odour control, and granulation.
Vacha [5]	*Acorus calamus*	Katu-Tikta rasa, Laghu-Teekshna guna, Ushna virya	Contains volatile oils (asarones) with strong antimicrobial action; promotes collagen synthesis and contraction of wound tissue.
Guggulu [6]	*Commiphora mukul*	Katu-Tikta-Kashaya rasa, Laghu-Ruksha-Sookshma guna, Ushna virya	Acts as anti-inflammatory, antimicrobial, and antioxidant; promotes fibroblast activity and angiogenesis.
Gour Sarshapa [7]	*Sinapis alba*	Katu-Tikta rasa, Laghu-Snigdha guna, Ushna virya	Isothiocyanates provide antibacterial and antifungal action; its pungent property promotes local vasodilatation and slough removal.

Chronic tropical ulcers pose significant therapeutic challenges due to their persistent nature, resistance to conventional treatments, and high risk of secondary infections. In this case, despite two years of standard therapies, including antibiotics and antiseptic dressings, the patient's ulcer showed no signs of healing. The persistent inflammation, as indicated by an elevated IL-6 level of 92.900 pg/mL, suggested an ongoing inflammatory process that contributed to delayed wound healing. This highlights the need for alternative or adjunctive treatments, such as Vranadhoopan Karma, which offers an Ayurvedic approach to wound management [8].

Vranadhoopan Karma involves the fumigation of wounds with medicinal herbs possessing antimicrobial, anti-inflammatory, and wound-healing properties. The use of Gaur Sarshap, Vacha, Nimba, and Guggulu in this process not only aids in reducing microbial load but also promotes granulation tissue formation. The gradual reduction in pain, wound size, and IL-6 levels (from 92.900 pg/mL to 6.20 pg/mL) within two weeks indicates a significant decrease in systemic inflammation and enhanced wound healing [9]. The mechanism behind this could be attributed to the immunomodulatory and antimicrobial properties of the herbs used, which help in reducing bacterial colonization and controlling excessive inflammatory responses [10].

The Dhoopan Dravyas used in this study exhibit multiple therapeutic actions, including Shothahara (anti-inflammatory), Vranashodhan (wound cleansing), Vranaropan (wound healing), Vedanasthapan (analgesic), Durgandhahar (deodorizing), Krimighna (antimicrobial), Putihar (antiseptic), and Karna Roga Shamak (ear disease alleviating). These properties contribute significantly to wound healing by addressing symptoms such as pus discharge (Puya), foul odor (Puti), pain (Vedana), and swelling (Shotha), ultimately preventing further tissue damage and accelerating the healing process. Several studies have scientifically validated the anti-inflammatory, antibacterial, antimicrobial, antifungal, antipyretic, analgesic, antiulcer, and antiseptic effects of these herbs, both individually and in combination [11]. These properties make them highly effective in managing suppurative conditions such as chronic wounds and infections, similar to their established role in treating otitis media with symptoms of discharge, foul smell, inflammation, pain, and tissue damage.[3]

Interleukin-6 (IL-6) plays a crucial role in inflammation and immune regulation. While it contributes to host defense by stimulating acute-phase responses, dysregulated IL-6 production is associated with chronic inflammation and autoimmune disorders [12]. In conventional medicine, IL-6 inhibitors like Tocilizumab have been used in inflammatory conditions such as rheumatoid arthritis and juvenile idiopathic arthritis.The significant decline in IL-6 levels observed in this case suggests that Vranadhoopan Karma may exert an immunomodulatory effect, helping to regulate excessive inflammation without the need for pharmacological IL-6 inhibitors [13].

This case reinforces the therapeutic potential of Ayurvedic wound fumigation in managing chronic ulcers, particularly in cases where conventional treatments fail. The absence of adverse effects, alongside the notable clinical improvements, suggests that Vranadhoopan Karma is a safe and effective complementary approach to chronic wound management [14-15-16]. Further clinical trials and controlled studies are required to establish its efficacy on a broader scale, comparing it with standard antimicrobial and anti-inflammatory therapies [17].

CONCLUSION

Chronic tropical ulcers remain a significant clinical challenge due to their persistent nature and resistance to conventional treatments. This case highlights the effectiveness of Vranadhoopan Karma as a complementary Ayurvedic intervention for wound healing. The notable reduction in pain, wound size, and inflammatory markers (IL-6 from 92.900pg/mL to 6.20pg/mL) within two weeks demonstrates its potential in reducing inflammation and accelerating tissue regeneration. The antimicrobial, anti-inflammatory, and wound-healing properties of Gaur Sarshap, Vacha, Nimba, and Guggulu contributed to improved wound outcomes without adverse effects.

This case underscores the immunomodulatory effects of Vranadhoopan Karma, suggesting its ability to regulate excessive inflammation without the need for pharmacological IL-6 inhibitors. Given the absence of complications and the observed clinical benefits, Vranadhoopan Karma presents itself as a safe and effective adjunctive therapy for chronic wound management. Further clinical trials and comparative studies are warranted to establish its efficacy on a larger scale and explore its role in integrative wound care approaches.

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