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A Case Report on Diabetic Foot Ulcer Treated with Topical Application of *Vraṇaropaṇa Taila* (Ayurvedic Medicated Oil)

[1]Dr Sajiya KT , [2]Dr Sunitha PV, [3]Dr KM Madhu, [4]Dr Anoop AK

1. PG Scholar, Department of Shalyatantra, VPSV Ayurveda College, P O Edarikode,Malappuram (Dist.),Kerala- 676501,India.
2. Professor, Department of Shalyatantra, VPSV Ayurveda College,P O Edarikode,Malappuram (Dist.),Kerala- 676501,India.
3. Chief Medical Officer, Arya Vaidya Sala, Kottakkal, P O Kottakkal, Malappuram (dist.), Kerala-676503,India.
4. Medical Officer, Arya Vaidya Sala, Kottakkal, P O Kottakkal, Malappuram (dist.), Kerala-676503,India.

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KEYWORDS

Diabetes mellitus, *Duṣtavr̥aṇa, Vraṇaropaṇa taila*

ABSTRACT:

Diabetes, a silent killer and globally renowned disease, has enormously afflicted most parts of the world causing serious health issues to an individual. The aetiology of these ulcers includes high glucose levels, improper foot hygiene, etc. The pathophysiology of diabetic foot ulcers involves oxidative stress to the nerve tissues and other complications leading to loss of sensation in the patient's feet. In DM the normal steps of wound healing are obliterated and hence the inflammatory phase is prolonged causing non healing status. *Taila lepana* (external application of medicated oil) is explained by *Ācārya Suśruta* for the management of *Vraṇa*.

We report an ethically approved (Approval No: IRB/Doc/PG/28/23; dated 10/10/2023) and CTRI registered (CTRI/2024/07/070784) case study of 64 years old female having a right foot wound with serous discharge and foul smell since 8 months. The case was treated throughout patient care with oral medication and lepana with Vranaropana taila followed by regular dressing for 60 days. Two months' procedure resulted in complete wound healing with normal scar formation and restored ability to walk.

Introduction

Diabetes is one of the most prevalent diseases across the world affecting around one-third of the population in the world and a major source of welcoming certain dreadful health conditions in most individuals. Multiple factors such as a sedentary lifestyle, genetic factors, more sugar intake, altered glucose metabolism etc. contribute to diabetic foot ulcer. Diabetes adversely affects health causing a surge in body weight, cardiac abnormalities, oxidative stress and other irregularities and one of these situations includes inordinate skin ailments occurring in the foot of the insulin-resistive person known as diabetic foot ulcer.

In this condition a breakdown occurs in the tissues of the foot's skin and layers present underneath the skin are vividly exposed. Vascular insufficiency and decrement in leucocyte function accompany these ulcers with infection, which might vary from simple cellulitis to further chronic osteomyelitis followed by frequent hospitalization.[1] It is difficult to manage them with routine exercise, diet or insulin treatment, but more than three-fourths of amputation is prevented if it is diagnosed at early stages and suitable treatment is been given to the

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patient.[2] *Vrana* means *gatravichurnana.*[3] If a *vrana* remains for many days and develops signs of infection, it is called *dustavrana*[4] (non-healing ulcer). *Shashtiupakrama* for *vrana* are explained by *Sushruta.*[5] *Taila lepana* is one of such procedure which helps in *vranashodhanaropana.*[6]

Vranaropana taila is mentioned in *Ayurveda Yoga Sangraha,*[7] where it is indicated as *vranaropanamuthamam*. Here we report a case of diabetic foot ulcer treated with oral medication and *lepana* with *Vranaropana taila* followed by dressing twice in a day.

Case report:

Patient information

A 64-year-old female patient, who is a housewife, having Type 2 diabetes mellitus, presented with non-healing ulcer at the ball of right foot since 8 months. Patient had diabetes since 7 years and was under regular medication for the same (Insulin-subcutaneous-15U in morning and 15U at night in a day). Patient had noticed it accidently as a wound. She took conservative management for 2 weeks from allopathic hospital but did not get complete relief. Later the wound area increased. The patient was consulted to Shalyatantra OPD, VPSV Ayurveda College hospital for further management.

CLINICAL FINDINGS

On initial examination, ulcer was found to be of 4×3.5cm size, round shape with central darkened area and thickened yellowish rim floor [Figure1]. Palpation of the wound revealed hard callous margin with normal temperature and no specific tenderness around the wound. Primary blood investigations have shown raised ESR 48mm/hr, WBC count 10000 cells/ mcL and Fasting Blood Sugar -148mg/dl and Post Prandial Blood Sugar - 220 mg/dl and HbA1c was 9.5%. It was diagnosed as a case of diabetic foot ulcer and treatment was designed as per the Ayurvedic recommendations of the *dushtavrana* management.

Therapeutic intervention:

Surgical debridement was done on the first day (Figure 2)

***Taila lepana* procedure (Application of ayurvedic medicated oil)**

***Purvakarma* (preparation of the patient) –** The patient was made to lie in comfortable position, the ulcer and surrounding area was cleaned with *triphala kashaya*. Later the area dried by using sterile gauze.

***Pradhana karma* (main procedure) –** A sterile gauze impregnated with *vranaropana taila* kept over the *vraṇa*. A sterile pad placed over it and dressing was done once daily in the morning for 8 hours.

***Pashchatkarma*-** After 8 hours the *vraṇa* was cleaned with lukewarm water and dressed with a plane sterile pad.

Table [1]- Plan of wound management through Ayurveda:

Plan	Procedure details	Duration
Kshalana	Ulcer cleaning with *triphala kashaya*	60 days
Lepana	Gauze impregnated with *Vranaropana taila* placed over the ulcer	60 days
Oral medications	*Manjishtadi Kashaya* 15ml mixed with 60 ml lukewarm water- half and hour before food- 7am and 7pm 2 *Kaisora guggulu* tablet- 2 times in a day after food	60 days
Follow up	*Manjishtadi Kashaya* and *kaisora gugulu* tablet	30 days

Follow-up and Outcome:

The patient was advised to follow the drug regime strictly. The condition of the patient was monitored on the 1st day, 14th day, 21st day, 28th day and

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60th day. After 14 days of treatment, there started to develop healthy granulation tissue (Fig 3). On 21st day, epithelialisation was started (Fig 4). On 28th day ulcer covered more than 50% of granulation tissue and epithelialisation (Fig 5). After two months of treatment, the ulcer later healed with complete epithelialisation and good scar formation (Fig 6). The patient was subsequently found able to perform her routine activities without any discomfort.

Fig. 1- Before debridement

(Day 1)

Fig. 2- After debridement
(Day 1)

Fig. 3- Image of ulcer
(Day 14)

Fig.4 – Image of ulcer

(Day 21)

Fig. 5 – Image of ulcer

(Day 28)

Fig. 6 – Image of ulcer

(day 60)

Discussion:

Wound occurs due to ischemia, infection and neuropathy in chronic diabetes and these wounds are always a challenge to treat. Infection is a common and major complication of diabetic foot wounds which leads to micro thrombi formation, causing further ischemia, necrosis, and progressive gangrene. The worst scenario for impaired would healing or the clearing of infection may be vascular insufficiency [8]. The formulation *vraṇaropaṇa taila* is specifically described as

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"*vraṇaropaṇamuttamam*",[7] signifying its excellence in wound healing. It contains *durvā, jāti, yaṣṭimadhu,* and *kāravī,* [7] each contributing to both *śodhana* and *ropaṇa* actions.

Durvā possesses *madhura, tikta* and *kaṣāya rasa*, *guru guṇa,* and *śīta vīrya.*[9] These properties reduce discharge and inflammation while promoting wound healing. *Jāti* which is characterized by *kaṣāya* and *tikta rasa*, *laghu, snigdha, mṛdu guṇa,* and *kaṭu vipāka*[10] is well known for its *vraṇaśodhana* and *ropaṇa* effects.[10] Studies have shown that it enhances wound contraction, granulation tissue formation and neovascularization, which are especially beneficial in chronic wounds such as diabetic foot ulcers.[11]

Yaṣṭimadhu, with *madhura rasa*, *guru* and *snigdha guṇa*, *śīta vīrya*, and *madhura vipāka*[12], supports wound healing by reducing pain, correcting pigmentation (*varṇya* property)[12] and exerting immunomodulatory effects that regulate inflammation.[13] It also exhibits *sandhāniya* and *śoṇitastāpana* actions, promoting collagen synthesis, tissue stabilization and epithelial regeneration.[13]

Kāravī is described as *kaṭu rasa*, *laghu, rukṣa guṇa*, *śotahara* and *durgandhanāśana.*[14] Studies confirm its antioxidant and antibacterial activities [15], explaining its efficacy in reducing foul odor and local inflammation.

When applied to an ulcer, *Vraṇaropaṇa Taila* acts on vitiated *doṣa* and *dhātu*. The *kaṣāya rasa* of *durvā* and *jāti* performs *lēkhana* and *klēdahara* actions, [16] facilitating slough removal and reducing exudates. *Kāravī* further mitigates foul smell and swelling.[14] The antioxidant properties of *durvā*[17] and *yaṣṭimadhu*[18] help neutralize excessive reactive oxygen species preserving fibroblasts and keratinocytes while their antibacterial activity prevents microbial colonization. The presence of fat soluble β-carotene in *durvā* enhances wound strength and vitamin A in *yaṣṭimadhu* aids keratinocyte migration and epithelialisation.[18]

As inflammation subsides, *durvā* and *jāti* through their *rakta-śodhaka* and *poṣaṇa* effects, improve circulation, support fibroblast proliferation, angiogenesis and extracellular matrix deposition resulting in healthy granulation tissue formation. *Jāti* phytochemicals, such as secoiridoids and triterpenes, provide antioxidant-driven cytoprotection and accelerate tissue repair,[19] while *C. carvi* suppresses inflammatory mediators (TNF-α, IL-1, IL-6), ensuring smooth transition from inflammation to proliferation.[19]

Finally, the *varṇya* and *tvak-prasādana* qualities of *durvā* and *yaṣṭimadhu* promote scar maturation with restored texture and pigmentation, leading to functional and aesthetic recovery of the wound. Thus, by integrating Ayurvedic principles with modern pharmacological insights, *Vraṇaropaṇa Taila* emerges as a potent formulation for addressing non-healing ulcers and restoring tissue integrity.

Conclusion:

In the present case, the diabetic foot ulcer healed in 60 days with good scar formation. Oral medication and *Vranaropana taila lepa* followed by wound dressing resulted in wound healing and hence removed the need of any surgical intervention by reducing the inflammatory stage and promoting proliferative phase.

Ethical Clearance and Trial Registration

The study was conducted after obtaining approval from the Institutional Ethics Committee of VPSV Ayurveda College, Kottakkal with Approval No: IRB/Doc/PG/28/23; dated 10/10/2023. The trial was prospectively registered in the Clinical Trials Registry of India (CTRI) with the registration number CTRI/2024/07/070784.

Therefore, the annotations for Consent, Intervention and Outcome are valid and may be accepted.

Consent to publish declaration:

Written informed consent was obtained from the patient for treatment, clinical documentation, and publication of anonymized data and images.

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Limitation of study:

Large sample size study should be conducted to validate the data.

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Conflict of interest:

There is no conflict of interest.

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