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SUCCESSFUL HEALING OF A CHRONIC DIABETIC FOOT ULCER THROUGH LEECH APPLICATION AND *APAMARGA KSHARA TAILA* WITH ADJUVANT AYURVEDA: A CASE REPORT

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ABSTRACT **Introduction:** Diabetic foot ulcers (DFUs) are a serious complication of diabetes mellitus, often leading to poor healing and increased amputation risk due to vascular and neuropathic compromise. **Case Details:** 70-year-old male with a chronic non-healing DFU of five months' duration, previously unresponsive to conventional treatment and advised for amputation. The ulcer presented with necrotic tissue, foul discharge, and signs of peripheral vascular compromise. Ayurvedic treatment was initiated with dietary modifications, local application of *Tankan Churna* and *Apamarga Kshara Taila*, oral administration of *Haritaki powder*, *Pippali powder*, and *Sanjivani Vati*, alongside *Panchavalkala Kwatha* irrigation and *Jalauka Avacharana* (leech therapy). **Result:** Progressive wound improvement was observed with complete healing by the sixth week, indicated by healthy granulation and tissue integrity. This outcome may be attributed to the wound debridement and healing-enhancing properties of *Kshara Taila*, anti-inflammatory and detoxifying action of oral drugs, and improved microcirculation from leech therapy. **Conclusion:** The case highlights the potential of integrative Ayurvedic protocols in managing chronic DFUs and preventing amputation. Further clinical studies are warranted to validate efficacy and establish standard Ayurvedic treatment guidelines for DFUs.

KEYWORDS : *Apamarga Kshara Taila*, Diabetic foot ulcer, *Haritaki, Madhu Mehaja Dusta Vrana, Pippali.*

INTRODUCTION

India was predicted to have around 20 million diabetes patients, but recent data from the INDIAB study (Diabetologia, 2011) revealed a far greater burden, with approximately 62 million people currently affected and projections exceeding 85 million by 2030. [1][2] Diabetes is associated with multiple complications, notably affecting the heart, kidneys, eyes, and feet, significantly impacting quality of life and increasing mortality risk.

Foot complications are particularly common, primarily due to prolonged hyperglycemia causing vascular and neuropathic damage.[3] Reduced blood flow and peripheral neuropathy impair wound healing and diminish pain perception, leading to unnoticed injuries, ulcer formation, and secondary infections. Vascular insufficiency also limits surgical options, making amputation less favourable due to poor healing outcomes.[4]

In Ayurveda, diabetic foot ulcers correlate with *Madhumehaja Dusta Vrana*, as described by Sushruta. He noted that in *Madhumeha*, weakened vessels in the lower limbs fail to eliminate vitiated Doshas such as *Meda* (fat) and *Rakta* (blood), resulting in *Prameha Pidaka* (boil-like eruptions) that rupture into chronic non-healing ulcers.[5][6] Sushruta emphasized that such wounds, especially on the lower limbs, are difficult to heal (*Kashtasadhya*).

Case Report

A 70-year-old male farmer with a 10-year history of type 2 diabetes mellitus presented with a chronic, non-healing ulcer of endogenous origin located on the dorsal aspect of the left foot, persisting for approximately 5 months. The ulcer was insidious in onset and associated with purulent discharge and difficulty in ambulation. Despite receiving conservative wound management, including daily antiseptic dressing with 5% povidone-iodine and oral hypoglycemic agents (Glimepiride 1 mg and Metformin 500 mg, twice daily), there was progressive worsening of the wound over a 4-month period. Due to the lack of clinical improvement, the patient was advised below-knee amputation to prevent systemic sepsis. However, the patient declined surgical intervention and opted for Ayurvedic treatment. Notably, the patient had previously undergone surgical amputation of the first, second, and third digits of the left foot one year prior due to diabetes-related complications (Figure 1).

CLINICAL EXAMINATION

Patient was pallor with no Icterus, Cyanosis, Lymphadenopathy. Patient had bilateral pitting oedema.

Local Examination revealed 8*6 cm^2 sized irregular shaped non healing ulcer at the dorsal of the left foot lower limb, Floor covered with Whitis yellow slough, copious-sero purulent discharge, foul smelling and Surrounding area was hyperpigmented with pre gangrenous changes (loss of hair, atrophic nails, glossy skin). 1^{st}, 2^{nd}, 3^{rd} toes of the left foot amputed. Patient had grade I tenderness with diminished pinprick sensation but hot and cold sensations present. Temperature of affected feet was normal. There was no enlargement of inguinal region or popliteal fossa. Dorsalis pedis and Anterior tibial artery feebly palpable while posterior and anterior tibial arteries of left foot had good blood flow.

Laboratory investigations showed mild anemia (haemoglobin 9.3 g/dL) and elevated erythrocyte sedimentation rate (84 mm/hour), indicating inflammation. Blood glucose levels (fasting 134 mg/dL, postprandial 160 mg/dL, random 134 mg/dL) and urine sugar (3+) indicated poor glycemic control. Renal (serum creatinine 0.6 mg/dL) and liver function tests (SGPT 15 IU/L, SGOT 36 IU/L) were normal. Bleeding and clotting times were within normal limits. Serological tests for HIV and HBsAg were negative. Digital X-ray of the right foot (AP and lateral views) showed no abnormalities.

Therapeutic Intervention

The patient was advised a restricted diet of *Mudga Yusha* (green gram soup) for the first 15 days. Local treatment began with daily application of *Tankan Churna* in normal saline to reduce slough and odor, followed by regular dressing with *Apamarga Kshara Taila* once healthy granulation appeared. Oral medications included *Haritaki* (*Terminalia chebula* Retz.) powder 3 g at bedtime with lukewarm water, *Pippali* (*Piper Longum* L.) powder 3 g with honey after meals, and *Sanjivani Vati* 1 tablet (125 mg each) thrice daily post meals. *Panchavalkala Kwatha* was used for wound irrigation before each dressing. *Jalauka Avacharana* (leech therapy) was performed every 7 days until complete healing.

OBSERVATION AND RESULT

On day 1 of treatment, the ulcer appeared unhealthy with necrotic tissue and exudate (Figure 1). By the end of the first week, there was a notable reduction in slough and exudate (Figure 2). After the second week, the ulcer bed showed healthy granulation tissue with a

significant reduction in ulcer size (Figure 3). The healing progressed steadily, and by the third, fourth, and fifth weeks, there was marked reduction in wound dimensions accompanied by healthy contraction of the ulcer margins (Figures 4–5). By the sixth week, the ulcer demonstrated complete healing with well-formed granulation and tissue integrity (Figure 6), indicating accelerated wound healing. This improvement can be attributed to the local application of *Apamarga Kshara Taila*, which likely promoted neovascularization, enhanced tissue perfusion, and stimulated collagen deposition, contributing to all phases of wound healing.

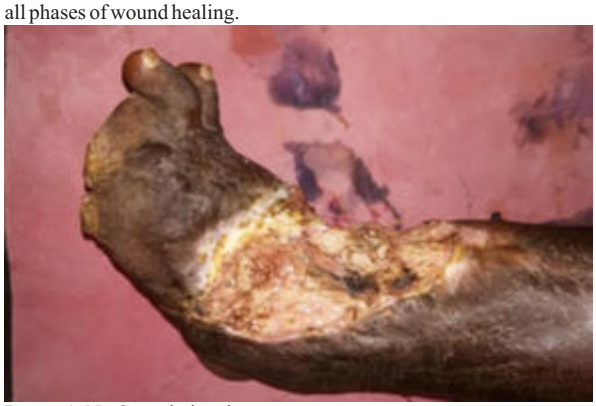

Image 1: No Granulation tissue seen

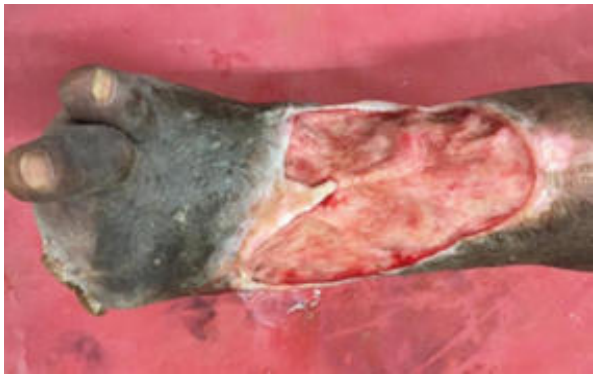

Image 2: Healthy Granulation Tissue

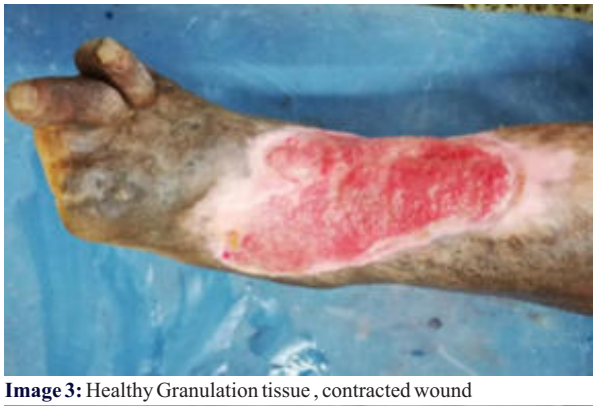

Image 3: Healthy Granulation tissue , contracted wound

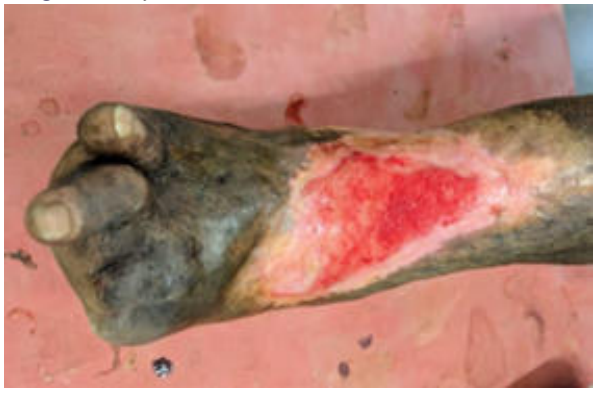

Image 4: Healthy Granulation tissue , contracted wound

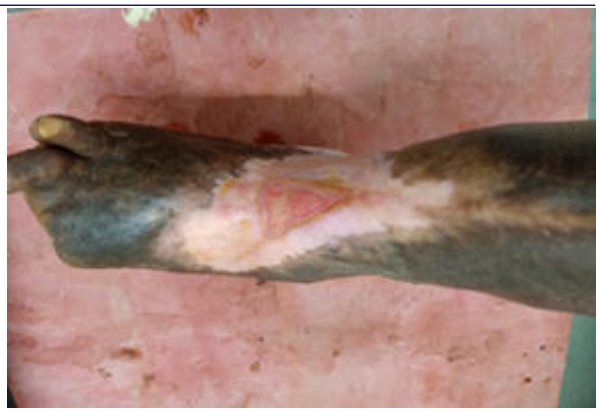

Image 5: Healthy Granulation tissue , contracted wound

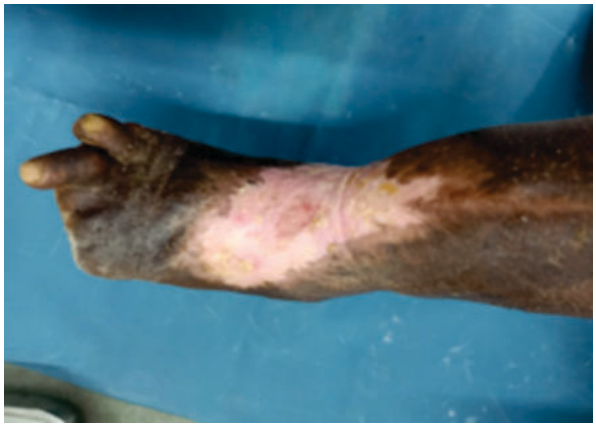

Image 6: healed wound with scar tissue

DISCUSSION

Acharya Sushruta highlighted the poor prognosis of *Dushta Vrana* (non-healing ulcers) associated with *Madhumeha* and noted that endogenous ulcers are difficult to heal in Ayurveda.[7] Ayurvedic management of diabetic foot ulcers has shown satisfactory outcomes, offering safe and patient-friendly alternatives to allopathic treatments. ***Tankan Churna*** exhibits *Lekhana* (scraping) and *Shodhana* (cleansing) properties, aiding in slough removal and promoting healthy granulation. Sushruta advocated the use of ***Kshara*** for wound debridement, particularly in *Dushta Vrana*.[8] ***Apamarga Kshara Taila***, prepared using fresh plant paste and *Kshara Jala*, facilitates autolytic debridement. Its alkaline nature neutralizes the acidic wound environment caused by ketone accumulation and pus, promoting healing.[9]

Panchavalkala Kwatha, rich in tannins, flavonoids, and phytosterols, acts as a *Shodhana* agent. It possesses anti-inflammatory properties that help reduce the inflammatory phase, enhance collagen synthesis, and support wound contraction and healing.[10] ***Pippali Churna*** with honey has antioxidant and *Pachana* (digestive stimulant) effects, aiding tissue rejuvenation and balancing *Rasa Dhatu* function.[11]

Haritaki provides *Anulomana* (mild laxative) effects, clearing metabolic waste and improving oxygenated blood flow through antioxidant action in vascular tissues.[12] Disease progression in diabetes is often due to poor diet, stress, and lack of foot care. *Nidana Parivarjana* (eliminating causative factors) is essential in Ayurvedic management. ***Sanjivani Vati,*** through its *Amahara* (digestive and detoxifying) action, may improve distal perfusion and tissue regeneration.[13]

Jalaukaavacharana (leech therapy), a form of *Raktamokshana*, helps eliminate vitiated *Rakta* and *Pitta*. Leech saliva contains active compounds like **hirudin, bdellins, eglins,** and vasodilators that enhance microcirculation, reduce inflammation and pain, and support tissue repair in diabetic ulcers.[14]

Mudga Yusha (green gram soup) and ***Shaali*** (plain rice) served as *Pathya Kalpana* (prescribed diet), improving *Rasa Dhatu* quality by reducing *Kleda* (waste), thereby enhancing *Rasa-Rakta Samvahana*

(circulatory function). Strict dietary adherence helped limit digestible calorie intake and prevented further disease progression.

CONCLUSION

This case study suggests that *Apamarga Kshara Taila* with adjuvant Ayurvedic treatment promotes healing of diabetic foot ulcers and may help avoid amputation. Further studies on more patients are needed for scientific validation.

CONSENT

Informed written consent has been taken from the patient before initiating the treatment. The patient also has given consent to publish her report for the purpose of knowledge dissemination in the field of clinical research. While preparing the case report, all necessary care has been observed to maintain the confidentiality of the patient's identity.

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Conflict Of Interest: The author declares that there is no conflict of interest

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