

CASE REPORT

Multimodal approach in the Management of Diabetic Foot Ulcer: A Single Case Report

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ABSTRACT

Diabetic foot ulcers (DFUs) are a grave complication of diabetes that results in notable morbidity and mortality. This instance aims to illustrate how Ayurvedic treatment and off-loading techniques can effectively manage DFUs. A 45-year-old male patient who had a known case of Type-II DM for ten years presented to the OPD with complaints of non-healing ulcer at the plantar aspect of the left foot for two months. The patient was managed with oral Ayurvedic medications such as Sanjivani Vati (125 mg) with lukewarm water four times a day after food and Haritaki Churna 5gm with lukewarm water at bedtime orally, Irrigation of wound with Triphala Kwatha, dressing of wound with Apamarga Kshara Taila and Yashtimadhu Malhara along with below knee posterior slab for eight weeks. After eight weeks of treatment ulcer was completely healed. This scientific case report highlights the value of a multidimensional approach in managing diabetic foot ulcers.

KEYWORDS

• Ayurveda • Apamarga Kshara Taila • DFUs • Dushtavrana

KEY MESSAGE:

The management of DFUs is constantly challenging and requires addressing many factors to achieve positive outcomes. Ayurveda, with contemporary science, has the potential to recover such types of chronic life-threatening conditions with improvement in patient quality of life.

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INTRODUCTION

Diabetic foot ulcers (DFUs) are a major complication of diabetes mellitus with considerable morbidity and mortality. International Diabetes Federation reports suggested that 9.1–26.1 million people will develop DFUs annually.¹ According to research data, it is estimated that this number will increase day by day due to improper lifestyles and unhealthy food habits. Published guidelines for the effective management of diabetic foot ulcers (DFUs) suggest a variety of treatment modalities in modern as well as adjuvant medicines such as surgical debridement, infection, and glycemic control, topical dressings, off-loading, hyperbaric oxygen therapy, negative pressure wound therapy.² All these types of remedies have their effectiveness with their limitation.

In Ayurveda, DFUs can be correlated with Madhumeha Janya Dushtavrana. Ayurveda has considerable herbal or herbo-mineral formulations which are effective in the management of wounds. Acharya Sushruta allotted a whole Adhyay to manage wounds using different procedures and drugs. Based on their clinical presentation, Sushruta stated *Shashti Upkrama* for the treatment of different types of wounds.³ With the ages, alternative therapy in wound management set its place in wound care management with positive outcomes. This case study aims to illustrate the advantages of a combined approach using

Ayurvedic internal and external therapies, alongside a posterior below-knee cast to relieve pressure from the affected area.

PATIENT INFORMATION

A 45-year-old man with a history of type 2 diabetes and hypertension for 10 years presented to our OPD with a non-healing ulcer at the plantar aspect of his left foot for 2 months. The patient had surgical debridement of the wound 2 months ago and was advised for osteotomy (metatarsal head excision) in the left foot. The patient underwent dressing of the wound regularly but did not get satisfactory results in wound healing. The patient on Antihypertensive (Tab Telmisartan 40mg OD) and Antihyperglycemic (Tab Metformin 500mg BD) medication since 10 years.

Clinical findings

A Physical examination of the patient's wound showed at the Head of the 5th metatarsal bone in the plantar aspect of the left foot, around 4×4×0.2 cm³ in size with a spherical shape. The floor of the wound covered with relatively fresh granulation tissues along with surrounding skin was thickened, the edge of the wound slightly everted and the margin of the wound was clearly defined. The foot was well vascularized with loss of peripheral sensation. Loss of sensation was noted in the bilateral foot. (Figure 1)



Figure 1 X-ray affected foot – Antero-posterior and Lateral view

Timeline

The timeline of the patient event and therapeutic measures depicted in Table. (Table 1)

Diagnostic assessment

Laboratory findings showed increased fasting blood glucose (240mg/dl) and Postprandial blood glucose (379mg/dl), and increased HbA1c (11.8%). C-reactive protein was 62.32mg/dl. Other lab investigations were within normal range. The comparative difference of laboratory investigation before and after treatment is mentioned in table. (Table no. 1) Imaging study X-ray left Foot (AP -Lateral view) suggested soft tissue swelling without significant osteomyelitis changes. (Figure 1)

Table 1: Laboratory findings before and after treatment

BT	AT
CBC - WNL	CBC - WNL
FBS - 240mg/dl	FBS- 104mg/dl
PPBS - 379	PPBS - 170mg/dl
HbA1C - 11.8%	HbA1C- 10%
CRP 62.32mg/dl	CRP-17mg/dl

Based on clinical findings, the patient was diagnosed with a diabetic foot ulcer with **Grade II Wagner** classification of a diabetic foot ulcer.

Therapeutic intervention

The patient was advised to continue his antihypertensive and antihyperglycemic medications. For the management of DFU in this case, a combined approach was adopted in the form of Ayurveda and conventional measures. (Table 2)

Table 2: Timeline

Sr. no.	Year	Clinical Events and Intervention
1.	May 2021	The patient had footwear trauma and neglected and afterward developed an ulcer at the plantar aspect of the left foot
2.	June-July 2021	Done dressing regularly at a private general practitioner for 20 days and failed to heal. Consulted a podiatric surgeon and was diagnosed as a DFU and he advised osteotomy. A patient refused for surgery. Continue dressing with betadine

3. 7th Aug 2021
A patient visited Shalya Tantra OPD, ITRA, Jamnagar, Advised oral as well as local Ayurveda treatment. Patient was advised to consult diabetologist for control of hyperglycemia.

4. 8th - 30th Aug 2021
The ulcer area was cleaned with Triphala Kwatha and Packed with Apamarg Kshara Taila. Sanjivani Vati 125mg QD after food with water and Haritaki Churna 5gm HS with warm water was given as oral Ayurveda medication. Offloading in the form of below-knee slab given in left foot.

5. 31st Aug - 9th Oct 2021
Size of ulcer reduction noted. All therapeutic measures continue except a local application for ulcer done with Yashtimadhu Malhara.

6. 10th Oct 2021
The ulcer completely healed. And advised for diabetic footwear.

7. Nov 2021- Feb 2022
No recurrence was noted

Outcome measures and follow-up

The patient was assessed daily for ulcer healing status and overall condition. Day by day, the size of the ulcer decreased, and almost 70% contracted after 6 weeks of treatment. Seropurulent discharge from the wound reduced and was absent after 4 weeks of treatment. As the patient had neuropathy, there was no pain in the ulcer area. After 8 weeks of integrative management of Ayurveda with conventional approach, the ulcer was completely healed. The patient reported no foot ulcer recurrence in the next six months (Figures 2 to 7).



Fig 2: First day of consultation **Fig 3:** After 2 weeks of treatment



Fig. 4: After 3 weeks of treatment



Fig 5: After 4 weeks of treatment



Fig. 6: After 6 weeks of treatment



Fig. 7: After 8 weeks of treatment

DISCUSSION

DFUs are a global burden as time passes although a variety of treatment options in medical science. The traditional approach for such chronic morbidity is rising day by day with positive results. Ayurveda has its wound management treasure given by Acharya Sushruta and it is time to implicate in such a condition. Wound irrigation is a primary principle to make wounds clean here in this case Triphala Kwatha was used for cleaning the wound and was proven to have antimicrobial antifungal activity by its chemical constituents such as tannins.⁴ Chemical debridement in the form of *Lekhan* (~scrapping) was needed in this ulcer as it was hyper granulated and had seropurulent discharge. To fulfill that need we applied *Apamarg Kshara Taila* initially as it has a potential effect on autolytic tissue debridement by its alkaline property. Consequently, it aids in the growth of sound granulation.⁵ Once the wound attained the healing stage, to fasten the process of healing ulcer was dressed with *Yashtimadhu Malhara* until the achievement of complete healing status. *Yashtimadhu Malhara* helps in the epithelialization of wounds by its skin regeneration activity.⁶ Oral Ayurveda medications *Haritaki* and *Sanjivani Vati* are proven for their *Vrana Ropan* and *Vrana Shodhan* effects by acting on *Agni* and metabolism at a cellular level.⁵ The patient had an ulcer on the ball area of the foot, specifically on the weight-bearing part. Offloading in the form of a below-knee slab helps in pressure relief and thus it helps in

the healing of DFUs.⁷ This case report details a multimodal approach to managing diabetic foot ulcers, highlighting positive outcomes without unintended consequences.

CONCLUSION

This case demonstrates the significant clinical improvement in the DFU. Ayurveda along with the conventional approach offers desirable outcomes in treating chronic ulcers. This case suggests a safe, cost-effective, and limb-saving approach towards diabetic foot ulcers.

Conflict of interest: There are no conflicts of interest.

REFERENCES

1. Armstrong DG, Boulton AJM, Bus SA. Diabetic Foot Ulcers and Their Recurrence. *N Engl J Med*. 2017;376(23):2367-75.
2. Everett E, Mathioudakis N. Update on management of diabetic foot ulcers. *Ann N Y Acad Sci*. 2018 Jan;1411(1):153-165.
3. Acharya JT, editor. Reprint ed. *Susruta Samhita of Susruta, Chikitsa Sthana Ch. 1, Ver. 8*. Varanasi: Chaukhamba Surbharti Prakashan; 2019.; p. 317.
4. Biradar YS, Jagatap S, Khandelwal KR, Singhania SS. Exploring of Antimicrobial Activity of Triphala Mashi-an Ayurvedic Formulation. *Evid Based Complement Alternat Med*. 2008 Mar;5(1):107-13.
5. Foram J, Dudhamal T.S., Wound healing effect of Apamarga Kshara Taila and adjuvant drugs in the management of Diabetic Foot Ulcer - A

- Case Report. *Annals Ayurvedic Med.* 2020; 9 (4): 320-327
6. Dudhamal TS. Review of grey literature on Ayurveda wound healing formulations and procedures - A systematic review. *J Ayurveda Integr Med.* 2023 Jul-Aug;14(4):100779.
7. Crews RT, Shen BJ, Campbell L, Lamont PJ, Boulton AJ, Peyrot M, Kirsner RS, Vileikyte L. Role and Determinants of Adherence to Off-loading in Diabetic Foot Ulcer Healing: A Prospective Investigation. *Diabetes Care.* 2016 Aug;39(8):1371-7.

