



## Surgery

## HEALING A NON-HEALING ULCER IN UNCONTROLLED DIABETES WITH AN INTEGRATIVE APPROACH: CASE REPORT

Dr. Komal Dhalani

Assistant Professor, Department of Shalya tantra, Sumandeep Ayurved Medical College and Hospital, Pipariya, Vadodara, Gujarat, India.

## ABSTRACT

Diabetic foot ulcers (DFUs) are a serious complication of diabetes mellitus that can lead to severe health issues and are difficult to manage due to poor blood circulation, neuropathy, and a high risk of infection. Majority of ulcer end up in This case report details the management of a 55-year-old male with Type 2 Diabetes Mellitus (DM-II) who developed a foot ulcer which was not healing from 45 days. This report aims to showcase the integrative management that led to the complete healing of the wound, which included regular dressings of *Yashtimadhu Malhara* (ointment preparation made from glycyrrhiza glabra), with conventional medicines for DM, infection control and educating the patient on proper foot care. The treatment resulted in a significant reduction in the wound size upto complete healing. This case underscores the importance of an integrated approach and provides practical insights for clinicians managing similar cases.

KEYWORDS : Foot care, Foot ulcer, *Yashtimadhu Malhara*

## INTRODUCTION:

Diabetic foot ulcers (DFUs) are a common and serious complication of diabetes, affecting 15-25% of diabetic patients worldwide (1). In India, the prevalence is high, ranging from 3-13% among the diabetic population (around 1.4 crore people), leading to significant morbidity and healthcare burden (2). DFUs are particularly concerning due to the high risk of complications, such as infection, osteomyelitis, and ischemia, which can lead to permanent disability or amputation. Research shows that up to 15% of diabetic patients will develop a foot ulcer, and 14-24% of these will require amputation (4). These complications are often due to poor glycemic control and delayed treatment, contributing to increased morbidity, mortality, and healthcare costs, as well as a reduced quality of life (5). Managing DFUs is complex, as it involves addressing infection control, glycemic management, wound care, and patient education. A multidisciplinary approach, including podiatrists, endocrinologists, surgeons, and wound care specialists, is essential (6,7,8).

This case report presents a 55-year-old male with uncontrolled Type-2 Diabetes Mellitus (DM-II) who successfully healed a diabetic foot ulcer through an integrated management plan. This plan included wound debridement, infection control, glycemic management, consistent wound care, and patient education on foot care. The case emphasizes the effectiveness of an integrated approach in managing diabetic foot ulcers.

## CASE REPORT:

## Patient Information:

A 55-year-old male presented with a chief complaint of a non-healing ulcer near the great toe of his right foot, persisting 45 days. The ulcer was accompanied by pus discharge and redness. The patient reported a history of a road traffic accident (RTA) that occurred 2 months ago, coinciding with the onset of the ulcer. He has been a known case of Type 2 Diabetes Mellitus (DM-II) for 10 years and underwent a bypass surgery before 10 years. His current medication regimen includes metformin and glimepiride, taken as 1 tablet once daily before breakfast.

## Local Examination on the day of admission:



Figure 1 Ulcer With Visible Inflamed Surrounding

An Oval shaped ulcer, approx 2.5 cm × 1.5 cm with irregular margins, Sloping and inflamed edges with Exposed subcutaneous tissue and

inflamed surroundings with pus discharge and redness around the ulcer located inferior to right great toe. On measuring it was of 2.2 cm × 1.9 cm size with a base of subcutaneous tissue. Arterial pulses i.e. Dorsalis pedis, Anterior tibial, posterior tibial were palpable, indicating adequate blood flow to the affected area.

## DIAGNOSTIC FOCUS:

The diagnostic focus for this patient involved following evaluations to understand the extent and severity of the diabetic foot ulcer and underlying diabetes control.

## Laboratory Tests (on the day of admission):

Laboratory investigations for total leukocyte count, differential leukocyte count, haemoglobin, blood urea and serum creatinine were in the normal range, while blood sugar was found elevated as mentioned following:

Hemoglobin A1c (HbA1c): 9.3%

Fasting Blood Sugar (FBS): 210 mg/dL

Postprandial Blood Sugar (PPBS): 308 mg/dL

## Imaging Studies:

Foot X-ray was conducted to rule out any fractures or underlying bone involvement that could complicate the ulcer. The X-ray showed no evidence of fractures, osteomyelitis, or other bony abnormalities, confirming that the ulcer was confined to the soft tissues.

## Classification:

Based on the Wagner Classification [9] System for diabetic foot ulcers, the patient's ulcer was classified as Grade 3. This grade indicates a deep ulcer with abscess, reflecting the severity of the condition.

## Therapeutic Intervention:

The ulcer was managed with both local and systemic treatments, following a comprehensive care plan designed to promote healing and prevent complications.

## Systemic Management:

Treatment Continuation: The patient continued his conventional diabetes medications after physician's reference, including Tab GLIMISON-M2 (500 mg / 2 mg) 1 TDS(B/F), throughout the treatment of the foot ulcer. This was essential for maintaining glycemic control.

## Local Management:

Under local anesthesia debridement was done on the very first day, The wounds were cleaned daily with normal saline to remove DEBRIS, followed by application of adequate quantity of *Yashtimadhu Malhara*. Foot Care and Offloading: The patient was advised on proper foot care, including measures to offload pressure from the affected area. Offloading with POP was given to reduce mechanical stress on the ulcer. Dressings were continued and changed regularly until complete wound healing was achieved in 24 days. The frequency of dressing changes was determined based on the condition of the ulcer and the amount of exudate.

## FOLLOW-UPS

The patient was observed at regular weekly intervals for changes in symptoms, including pain, color, discharge, and odor. These observations were crucial for assessing the progress of healing and making any necessary adjustments to the treatment plan.

## OUTCOME

The treatment regimen led to significant improvement in the patient's condition within a span of 24 days. The ulcer size, which was initially approximately 2.5 cm in length and 1.5 cm in breadth, reduced significantly and eventually healed completely with no visible ulceration. The wound's appearance improved as the initially irregular margins became more regular, and granulation tissue filled the ulcer bed, indicating active healing. The initial symptoms of pus discharge and redness around the ulcer decreased progressively, and by the end of the treatment, there was no discharge and the redness had resolved completely. Additionally, the patient reported a reduction in pain and absence of foul odor as the wound healing progressed.



Figure 2: 4<sup>th</sup> day of dressing



Figure 3: 7<sup>th</sup> day of dressing



Figure 4: 10<sup>th</sup> day of dressing



Figure 5: 15<sup>th</sup> Day Of Dressing



Figure 6: 23<sup>rd</sup> day of dressing

## DISCUSSION:

Diabetic foot ulcers are difficult to treat due to factors like poor circulation, neuropathy, and weakened immune function common in diabetic patients. These issues delay wound healing and increase infection risk, complicating management (10). The patient's elevated HbA1c of 9.3%, Fasting Blood Sugar (FBS) of 210 mg/dL, and Postprandial Blood Sugar (PPBS) of 308 mg/dL indicate poorly controlled diabetes, which worsens wound healing and raises complication risk (11). Research shows that uncontrolled diabetes significantly hampers wound healing by affecting inflammatory response, angiogenesis, and collagen synthesis (12). Strict glycemic control has been proven to improve diabetic foot ulcer healing outcomes (13). By maintaining strict blood sugar levels, providing appropriate wound care, and ensuring patient adherence, healing prospects improve. In this case, conventional diabetes medications aided better glycemic control, enhancing wound healing beyond expectations due to the integrated management approach.

Additionally, applying *Yashtimadhu Malhara* locally, known for its anti-inflammatory and healing properties, supported granulation and epithelialization of the ulcer (14). Combining traditional and conventional treatments has been shown to have synergistic effects on chronic wound management (15). Regular follow-ups and meticulous wound care were crucial for recovery. Daily wound cleaning with saline and applying *Yashtimadhu Malhara* created an optimal healing environment, while monitoring changes in symptoms allowed for timely adjustments (16). Effective wound care management, including debridement, infection control, and moisture balance, is essential for healing diabetic foot ulcers (17).

The patient's education on foot care and use of offloading strategies were vital in recovery. Practices like protective footwear and offloading devices reduced stress on the ulcer, preventing further damage and aiding healing. Studies confirm that patient education and offloading are key in managing diabetic foot ulcers and preventing recurrence (18). Offloading reduces pressure, improving blood flow and healing. The patient's commitment to regular follow-ups and preventive measures is essential for preventing recurrence and ensuring long-term foot health.

## CONCLUSION

This case shows the importance of a multidisciplinary approach in managing complex diabetic foot ulcers, particularly in patients with poorly controlled diabetes. Integrative management with conventional diabetes medications and the local application of *Yashtimadhu Malhara*, along with diligent wound care and foot care practices, showed successful healing.

## RECOMANDATION

The observation needs to be studied in a greater number of patients to explore better options for diabetic wound management.

## ACKNOWLEDGEMENT

I express my sincere gratitude to Principal, SAMCH for supporting and providing the background to carry out research study.

## CONSENT OF PATIENT

Informed written consent of the patient was taken for procedure and publication of the images without disclosing the identity of a patient.

## CONFLICT OF INTEREST

None

## REFERENCES:

1. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. JAMA. 2005;293(2):217-228.
2. Pendsey S. Diabetic Foot: A Clinical Atlas. Jaypee Brothers Medical Publishers; 2003.
3. Boulton AJM, Vileikyte L, Ragnarson-Tennvall G, Apelqvist J. The global burden of diabetic foot disease. Lancet. 2005;366(9498):1719-1724.
4. Lavery LA, Armstrong DG, Wunderlich RP, Mohler MJ, Wendel CS, Lipsky BA. Risk factors for foot infections in individuals with diabetes. Diabetes Care. 2006;29(6):1288-1293.
5. Game FL, Hinchliffe RJ, Apelqvist J, et al. A systematic review of interventions to enhance the healing of chronic ulcers of the foot in diabetes. Diabetes Metab Res Rev. 2012;28(Suppl 1):119-141.
6. Lavery LA, Armstrong DG, Wunderlich RP, Mohler MJ, Wendel CS, Lipsky BA. Risk factors for foot infections in individuals with diabetes. Diabetes Care. 2006 Jun;29(6):1288-93.
7. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. JAMA. 2005 Jan 12;293(2):217-28.
8. Wagner FW Jr. The dysvascular foot: a system for diagnosis and treatment. Foot Ankle. 1981;2(2):64-122.
9. Brem H, Tomic-Canic M. Cellular and molecular basis of wound healing in diabetes. J Clin Invest. 2007 May;117(5):1219-22.
10. Prompers L, Huijberts M, Apelqvist J, et al. High prevalence of ischemia, infection, and serious comorbidity in patients with diabetic foot disease in Europe. Diabetologia. 2007 Jan;50(1):18-25.
11. Bhat S, Kumar G, Parashar A, Srivastava S. Effect of Yashtimadhu (Glycyrrhiza glabra) on chronic ulcers: A clinical study. Ayu. 2010 Jan-Mar;31(1):100-3.
12. Kshirsagar A, Aggarwal V, Singla A, Garg R, Sharma D. Integrative approach for wound healing in diabetes: Traditional medicine in modern practices. J Diabetes Metab Disord. 2018;17(1):21-30.
13. Wu SC, Driver VR, Wrobel JS, Armstrong DG. Foot ulcers in the diabetic patient, prevention, and treatment. Vasc Health Risk Manag. 2007 Nov;3(1):65-76.
14. Steed DL. Clinical evaluation of recombinant human platelet-derived growth factor for the treatment of lower extremity diabetic ulcers. J Vasc Surg. 1995 Sep;22(3):302-11.
15. Armstrong DG, Lavery LA. Diabetic foot ulcers: prevention, diagnosis, and classification. Am Fam Physician. 1998 Oct 1;57(6):1325-32.
16. Frykberg RG, Zgonis T, Armstrong DG, et al. Diabetic foot disorders: a clinical practice guideline. J Foot Ankle Surg. 2006 Sep-Oct;45(5 Suppl):S1-66.
17. Jeffcoate WJ, Harding KG. Diabetic foot ulcers. Lancet. 2003 May 3;361(9368):1545-51.
18. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. JAMA. 2005 Jan 12;293(2):217-28.