Case Report

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Others Section

Successful Conservative Management of a Deep Plantar Diabetic Foot Ulcer in the Presence of Superficial Venous Insufficiency: A Case Report

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ABSTRACT

Diabetic Foot Ulcers (DFUs) are a common and challenging complication of diabetes, often leading to significant morbidity and increased risk of amputation. This case report describes a 56-year-old male with type 2 diabetes and hypertension who presented with chronic non-healing ulcer over the plantar aspect of the left foot of one-year duration, measuring approximately 5×3 cm, associated with pain and swelling. Clinical examination revealed maggot infestation, callus formation, and serous discharge. Laboratory evaluation demonstrated leucocytosis {White Blood Cell (WBC) 14,000/mm^3} and suboptimal glycaemic control {Glycosylated Haemoglobin (HbA1c) 7.2%}, which improved to 6.5% on follow-up after intensification of therapy. Plain radiographs showed no evidence of osteomyelitis, and the ulcer was classified as Wagner Grade 2. Management included regular sharp debridement, moisture-retentive dressings, stepwise antibiotic therapy, glycaemic optimisation, and offloading using pressure-relieving footwear. Doppler studies revealed superficial venous insufficiency with lower-limb oedema, which was addressed through supportive measures. No growth was found on the wound swab culture. Within two weeks, marked clinical improvement was observed, with reduction in ulcer size to approximately 2.5×1 cm and the development of healthy granulation tissue. This case highlights the importance of early diagnosis, structured wound care management in achieving favourable outcomes, even in the presence of complicating factors such as venous disease and metabolic instability.

Keywords: Debridement, Diabetes mellitus, Off-loading, Peripheral neuropathy, Wound healing

CASE REPORT

A 56-year-old male presented in the outpatient department with a chronic non-healing ulcer on the plantar aspect of the left foot of one year's duration, associated with pain and swelling. The ulcer was oval and measured approximately 5×3 cm at presentation. He had a known history of type 2 diabetes mellitus, systemic hypertension, and varicose veins with suboptimal glycaemic control (fasting glucose 160 mg/dL, postprandial 290 mg/dL, HbA1c 7.2%) [Table/Fig-1]. He was receiving glimepiride, metformin, and amlodipine. The patient had previously undergone surgical amputation of the left fourth toe following road traffic trauma.

[Table/Fig-1]: Initial plantar ulcer with slough and callus.
Initial clinical photograph showing a Wagner Grade 2 plantar ulcer over the left forefoot with slough and surrounding callus (approximately 5×3 cm)

Local examination revealed a plantar ulcer containing slough, necrotic debris, and maggots (myiasis), with surrounding callus and serous discharge. Mild swelling was present without warmth or erythema, suggesting no overt infection. Peripheral pulses were palpable, and protective sensation was intact. Laboratory evaluation revealed leucocytosis (WBC 14,000/mm^3) with neutrophil predominance, haemoglobin 13.5 g/dL, platelet count 350,000/mm^3, blood urea 25 mg/dL, and serum creatinine 0.7 mg/dL.

Plain radiographs showed postsurgical absence of the fourth toe with soft-tissue prominence in the second web space without cortical erosion or features of osteomyelitis [Table/Fig-2a,b]. There were no radiographic features of osteomyelitis. Venous Doppler revealed superficial varicose veins with incompetent perforators and diffuse subcutaneous oedema, without thrombosis.

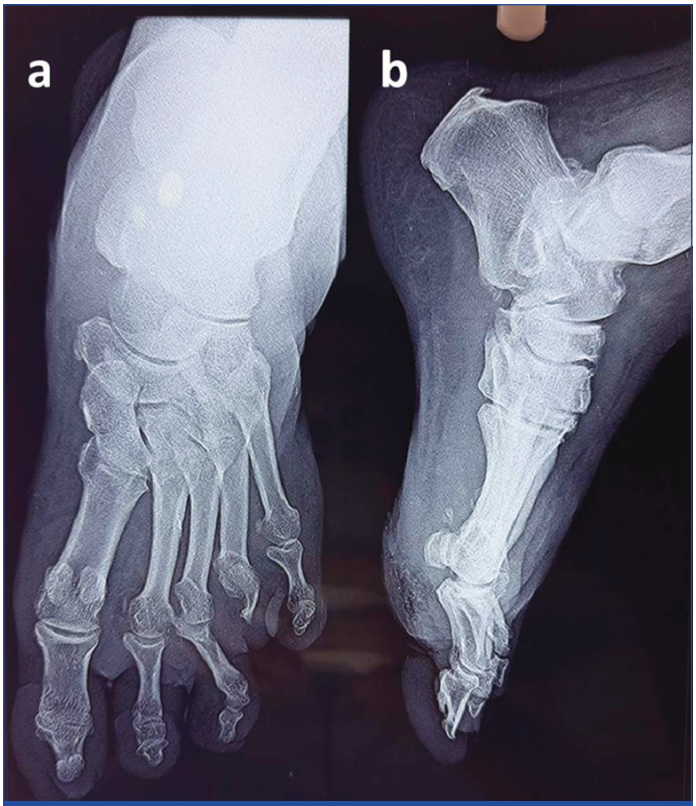
Diagnosis

Chronic plantar ulcer in a diabetic patient with preserved pulses and no radiographic bone involvement was consistent with a Wagner Grade 2 DFU [1] without systemic infection.

Therapeutic Intervention

A wound swab was obtained before intervention. Maggot removal was performed using turpentine oil application for 30 minutes, followed by saline and povidone-iodine cleansing. Sharp surgical debridement and callus removal were undertaken.

Empirical oral antibiotics, cefixime 200 mg twice daily and ornidazole 500 mg twice daily were initiated for local inflammation for five days. Daily wound care was continued. Due to limited response and persistent leukocytes, therapy was escalated to oral linezolid 600 mg twice daily for seven days. Compression stockings were advised for venous insufficiency.



[Table/Fig-2]: Plain radiographs of the left foot: a) Anteroposterior view; b) Lateral view.
Plain radiographs demonstrating post-surgical absence of the fourth toe with no cortical erosion, periosteal reaction, osteolysis, or soft-tissue gas suggestive of osteomyelitis

Local care included regular debridement, moisture-retentive dressings, and structured offloading using Total Contact Casting (TCC) during the active phase [Table/Fig-3], followed by transition to pressure-relieving footwear [Table/Fig-4]. Reduced weight-bearing and foot-care education was reinforced.

Glycaemic therapy was intensified: glimepiride was increased to 2 mg twice daily and sitagliptin 50 mg once daily was added. Serial random blood glucose levels improved from 196 to 168 and 162 mg/dL. A subsequent HbA1c measurement showed a reduction from 7.2% to 6.5%, suggesting improved glycaemic control.

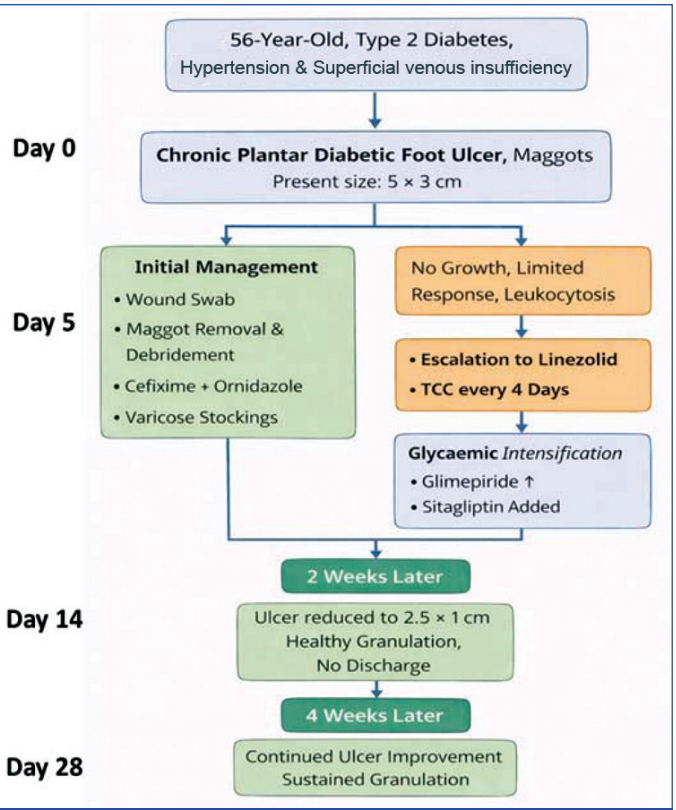
Follow-up was conducted. Healing assessment included reduction in ulcer size and depth, decreased slough, healthy granulation tissue, and absence of erythema or discharge. By three weeks, there was a marked reduction in ulcer dimensions [Table/Fig-5]. Serial follow-up over four weeks demonstrated progressive reduction in ulcer depth and sustained granulation tissue formation, without infection or need for surgical intervention [Table/Fig-6]. A schematic representation summarising the timeline of interventions and clinical improvement over four weeks is shown in [Table/Fig-7].

[Table/Fig-3]: Total Contact Casting (TCC).
Application of TCC during the active wound care phase to achieve effective plantar pressure redistribution and offloading

[Table/Fig-4]: Pressure-relieving footwear.
Therapeutic pressure-relieving footwear used during the maintenance phase to ensure continued offloading and prevent recurrence

[Table/Fig-5]: Early follow-up.
Clinical photograph demonstrating reduction in ulcer dimensions with healthy granulation tissue and absence of surrounding erythema or purulent discharge

[Table/Fig-6]: Follow-up clinical photograph.
Clinical image showing further reduction in ulcer depth with sustained granulation tissue formation, indicating favourable healing progression



[Table/Fig-7]: Timeline and Stepwise Conservative Management of a Wagner Grade 2 Diabetic Foot Ulcer (DFU).
Diagrammatic representation of sequential interventions including maggot removal, antibiotic therapy, glycaemic intensification, compression therapy, offloading with TCC, transition to pressure-relieving footwear, and progressive clinical improvement over four weeks

DISCUSSION

The DFUs remain one of the most challenging complications of diabetes mellitus and represent a significant cause of morbidity, hospitalisation, and lower-limb amputation worldwide. Nearly 15-25% of individuals with diabetes are estimated to develop a foot ulcer during their lifetime, with recurrence rates exceeding 40% within one year. In India, the prevalence of DFUs has been reported to be approximately 6.2%, highlighting the growing burden of diabetes-related complications in the region [2,3]. Early recognition and evidence-based management are essential [4]. This case highlights that structured, guideline-based care can achieve rapid improvement even without advanced wound technologies.

The ulcer met criteria for Wagner Grade 2, indicating deep tissue involvement without bone infection. Accurate grading influences prognosis and management [2]. International Working Group on the Diabetic Foot (IWGDF) guidelines recommends plain radiographs to exclude osteomyelitis or soft-tissue gas [5]. In this case, normal radiographic findings supported conservative treatment.

Regular sharp debridement is a cornerstone of DFU care, reducing necrotic burden, lowering plantar pressure, and stimulating granulation [6]. Maintenance of a moist wound environment further promotes healing, and consistent use of moisture-retentive dressings contributed to the favourable outcome observed. Although TCC is considered the gold standard for neuropathic plantar ulcers, real-world limitations often restrict its use in low-resource settings [7,8].

Superficial venous insufficiency with oedema represented an important complicating factor. Venous oedema can impair tissue perfusion and delay wound healing [6,9]. The addition of compression therapy using varicose stockings likely aided in reducing lower-limb oedema and improving the wound microenvironment, thereby complementing standard DFU management.

Although the wound culture showed "no growth," empirical antibiotics were initiated due to leukocytosis and clinical concern for inflammation. The regimen followed established principles of coverage for common soft-tissue pathogens, with commonly recommended agents including beta-lactam/beta-lactamase inhibitors, cephalosporins, clindamycin, fluoroquinolones, and linezolid [10]. Owing to limited early response and persistent leukocytosis, therapy was escalated to oral linezolid (an oxazolidinone antibiotic) for enhanced Gram-positive coverage. This approach aligns with the Infectious Diseases Society of America (IDSA) guidance, which emphasises that clinical judgement supersedes swab culture results in early DFU management [7].

Suboptimal glycaemic control is a recognised barrier to wound healing. At presentation, the patient's HbA1c was 7.2%, indicating moderate hyperglycaemia. At follow-up, HbA1c improved to 6.5% following intensification of oral antidiabetic therapy. Intensification of oral antidiabetic therapy, including escalation of sulfonylurea dosage and addition of a DPP-4 inhibitor, resulted in progressive improvement in random blood glucose levels during follow-up. Improved metabolic control has been associated with enhanced neutrophil function, reduced inflammatory cytokine activity, and improved collagen deposition, all of which support tissue repair. Improved metabolic control has been shown to enhance neutrophil function, reduce inflammatory mediators, and promote collagen deposition, all of which facilitate wound healing [11].

In the present case, application of TCC during the active care phase followed by transition to pressure-relieving footwear was associated with marked ulcer size reduction and healthy granulation within four weeks- representing a faster trajectory than many published series [12]. In the present case, a chronic one-year ulcer measuring 5×3 cm reduced to approximately 2.5×1 cm within two weeks, with sustained granulation tissue over four weeks, representing a favourable healing trajectory.

Overall, the healing outcome in this case was comparable to or better than outcomes reported in similar Wagner Grade 2 DFUs, where healing commonly requires 8-12 weeks or longer [8,13-15]. In contrast, this patient demonstrated significant granulation and reduction in ulcer depth within four weeks. This early response highlights the impact of structured, guideline-based therapy and comprehensive management in achieving favourable outcomes, even in clinically complex presentations.

CONCLUSION(S)

This case demonstrates that a Wagner Grade 2 plantar DFU complicated by superficial venous insufficiency and lower-limb oedema achieved marked improvement within four weeks with structured conservative management. Serial sharp debridement, TCC followed by pressure-relieving footwear, clinically guided antibiotic therapy, and glycaemic optimisation collectively promoted granulation and ulcer depth reduction. Close follow-up and appropriate care enabled successful healing without surgical intervention or osteomyelitis.

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