

Varicose Vein Sclerotherapy Using Polidocanol for Chronic Non-Healing Leg Ulcer: A Case Report from Muhimbili National Hospital

Azza Naif, MMed^{1*}, Wesley D. Oliver, B.S.², Erick Mbuguje, MMed³, Shemin Mehta, MBChB⁴,
Mwivano Shemweta, MMed⁵

^{1*}Interventional Radiologist Department of Radiology, Muhimbili National Hospital Dar es Salaam,
Tanzania

²Medical Student Howard University College of Medicine

³Interventional Radiologist Department of Radiology, Muhimbili National Hospital Dar es Salaam,
Tanzania

⁴Consultant Interventional Radiologist Liverpool University Hospitals NHS Foundation Trust
Liverpool, United Kingdom

⁵Interventional Radiologist Department of Radiology, Muhimbili National Hospital Dar es Salaam,
Tanzania

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ABSTRACT

Background: Chronic venous ulcers represent the most severe manifestation of chronic venous insufficiency and are associated with significant morbidity, particularly when longstanding and untreated. In low-resource settings, limited access to advanced vascular interventions often results in prolonged disease duration and poor outcomes. Minimally invasive techniques such as ultrasound-guided foam sclerotherapy offer a potential alternative for definitive management.

Case Presentation: We report a 26-year-old male who presented with a 10-year history of left lower limb swelling and a chronic non-healing ulcer around the ankle. The lesion initially developed as a raised skin lesion and progressed into an ulcer associated with intermittent bleeding. Clinical examination revealed varicose veins and localized swelling of the left lower limb. Duplex ultrasound demonstrated dilatation of the small saphenous vein with an incompetent sapheno-popliteal junction and multiple incompetent perforator veins, with no evidence of deep venous thrombosis.

Intervention: The patient underwent ultrasound-guided polidocanol foam sclerotherapy targeting the incompetent venous segments.

Outcome: Following treatment, progressive ulcer healing was observed, culminating in complete epithelialization and resolution of symptoms. No complications were reported.

Conclusion: This case demonstrates that ultrasound-guided polidocanol foam sclerotherapy can achieve complete healing of longstanding venous ulcers by addressing underlying venous reflux. It also highlights the feasibility and effectiveness of this minimally invasive technique in a low-resource setting and supports its broader adoption in similar healthcare environments.

Keywords: Chronic venous ulcer, polidocanol, foam sclerotherapy, interventional radiology, Tanzania, venous insufficiency

INTRODUCTION

Chronic non-healing ulcers are a major clinical challenge worldwide and are associated with significant morbidity, reduced quality of life, and increased healthcare costs. In sub-Saharan Africa, this problem can be exacerbated by delayed presentation, limited access to vascular imaging, and restricted surgical resources that delay treatment. When the underlying venous pathology is not addressed, these ulcers often persist for many years and have a low likelihood of spontaneous healing. [1]

Chronic venous ulcers are open skin lesions of the lower extremity that persist for more than four to six weeks and arise as a consequence of chronic venous insufficiency, commonly due to superficial venous reflux resulting from valvular incompetence. These ulcers are typically located near the medial or lateral malleolus depending on the primarily affected superficial vein and are usually preceded by clinical features such as visible varicosities, limb swelling, skin induration, and dermatitis. [2] Epidemiological studies estimate the prevalence of venous leg ulcers to range between 0.1% and 1% of the adult population in high-income countries, with substantial healthcare utilization associated with long-term management. [3]

Effective treatment of venous ulcers requires correction of the underlying venous reflux in addition to wound care and compression therapy. The use of foam sclerotherapy as a treatment of chronic ulcers by targeting superficial venous reflux—a key driver of ulceration—has become a viable option for many patients. [1] This is a minimally invasive procedure performed under ultrasound guidance, that allows for targeted ablation of refluxing venous segments. This technique has been shown to accelerate ulcer healing, improve venous clinical severity scores, and enhance patient quality of life, especially when combined with compression. [4,5]

In this report, we describe a 26-year-old male with a 10-year history of chronic non-healing venous ulcer who underwent ultrasound-guided polidocanol foam sclerotherapy with complete ulcer resolution. To our knowledge, this represents one of the first reported uses of this technique for chronic ulcer management in Tanzania and highlights the potential role of interventional radiology treatments for chronic venous disease in low-resource settings.

Case Presentation

A 26-year-old male presented to our outpatient clinic with a 10-year history of left leg swelling and ulceration around the lateral malleolus. He reported that the ulceration started as a hard raised skin lesion, which later progressed into an ulcer. The ulcer was associated with intermittent episodes of bleeding.

The patient also noted the presence of multiple tortuous vascular structures along the lower leg. He reported multiple prior episodes of conservative management, including wound care, with no significant improvement. A biopsy at the ulcer was done in 2024 which was reported as consistent with a lobular capillary hemangioma.

At presentation his blood pressure was 110/60mm of Hg, heart rate 70 beats/min, respiratory rate 20 cycles/min and temperature 37.2 C. Chest and abdominal examination were unremarkable. Both lower limbs were warm to the touch. Some swelling was noted on the left lower leg with visible varicose veins on the left calf extending to just above the ankle (Figure 5A). Laboratory examinations were within normal limits. Lower extremity duplex ultrasound showed a dilated left short saphenous vein (SSV) measuring about 5.6mm with an incompetent sapheno-popliteal junction and perforators (Figures 1A, 1B, and 2). The great saphenous vein (GSV) was normal. There was no evidence of deep vein thrombosis (DVT) and arterial flow was normal.

Based on clinical and imaging findings, the patient was diagnosed with chronic venous insufficiency with varicose veins involving the left lower limb. He was subsequently scheduled for ultrasound-guided foam sclerotherapy of the short saphenous vein using polidocanol foam.

The procedure was performed under ultrasound guidance with the patient in a prone position. The vein was identified and multiple punctures were made along its length each about 4cm apart (Figures 3 and 4). 3% polidocanol was mixed with air at a ratio of 1:3 (2 mls with 6 mls). Compression was applied at the saphenopopliteal junction to prevent the mixture from going into the deep veins. The mixture was then slowly

injected under ultrasound guidance, starting from a few centimeters adjacent to the junction downwards. Compression was maintained for about 10 minutes and released. A compression bandage was then applied immediately after the procedure as part of a three-layer dressing.

The patient reported one week later for a follow-up, and a repeat procedure was done using 0.5ml of 3% polidocanol mixed with 1.5mls of air. Follow up of the patient at 1, 3, 6 and 12 months showed gradual resolution of the ulcer to a subsequent complete healed ulcer at 4 months (Figure 5B). No recurrence was noted at 2 years follow-up.

DISCUSSION

Chronic venous insufficiency (CVI) is a progressive disease resulting from valvular incompetence and venous reflux, which ultimately leads to venous hypertension and microcirculatory dysfunction. [1] Persistent venous hypertension contributes to inflammatory changes within the skin and subcutaneous tissues, resulting in lipodermatosclerosis, pigmentation, and eventual ulceration. Venous ulcers are classified as C6 disease under the Clinical-Etiologic-Anatomic-Pathophysiologic (CEAP) classification system, representing the most advanced stage of chronic venous disease. In this stage, failure to correct the underlying venous reflux significantly reduced the likelihood of spontaneous ulcer healing. [2]

In the present case, duplex ultrasound demonstrated dilation of the short saphenous vein with an incompetent saphenopopliteal junction and multiple incompetent perforator veins, findings consistent with superficial venous reflux as the primary driver of venous hypertension. Treatment targeted the underlying pathophysiology using ultrasound-guided polidocanol foam sclerotherapy, which induces endothelial damage, thrombosis, and eventual fibrosis of the treated vein. By eliminating reflux within the incompetent venous segments, venous pressure in the distal limb is reduced, improving tissue perfusion and facilitating wound healing. [1]

Foam sclerotherapy offers several advantages compared with liquid sclerosants. The foam displaces blood within the vein lumen and provides greater contact with the venous endothelium, thereby increasing the effectiveness of the sclerosant. Clinical trials have demonstrated that foam preparations are significantly more effective than liquid formulations in achieving vein occlusion and eliminating reflux. [6,7] As a result, ultrasound-guided foam sclerotherapy has become an established minimally invasive treatment option for superficial venous disease.

Evidence from the literature supports the use of foam sclerotherapy for patients with active venous ulcers. A prospective randomized study comparing surgical treatment with polidocanol foam sclerotherapy demonstrated similar ulcer healing rates between the two modalities, with healing occurring in over 90% of patients treated with foam sclerotherapy. [8] Other studies have shown that treating superficial venous reflux with foam sclerotherapy significantly improves ulcer healing and reduces recurrence when combined with compression therapy. [9] Additionally, large observational cohorts have reported that a majority of patients with advanced venous disease experience healing or significant improvement within one year following foam sclerotherapy. [10]

An important aspect of the present case is the long duration of ulceration prior to definitive treatment. Chronic ulcers persisting for several years are often associated with tissue fibrosis and impaired healing potential. The complete healing observed in this patient after treatment of the underlying venous reflux highlights the importance of addressing the underlying hemodynamic abnormalities rather than relying solely on conservative wound care.

This case also illustrates the potential value of interventional radiology techniques in low-resource healthcare settings. Traditional surgical treatments for varicose veins may require operating room infrastructure, anesthesia services, and prolonged recovery times. In contrast, ultrasound-guided foam sclerotherapy can be performed as an outpatient procedure with minimal equipment requirements, making it particularly suitable for healthcare systems with limited surgical capacity. The successful outcome in this patient demonstrates that minimally invasive venous interventions can be effectively implemented in such settings.

Finally, this case may represent one of the early documented uses of polidocanol foam sclerotherapy for chronic venous ulcer management in Tanzania, highlighting the expanding role of interventional radiology in the management of vascular diseases within sub-Saharan Africa. Broader implementation of these techniques could significantly improve outcomes for patients suffering from chronic venous disease in similar resource-limited environments.

Although endovenous techniques such as foam sclerotherapy are widely used in high-income countries for the management of superficial venous insufficiency and venous ulcers, reports describing their implementation in sub-Saharan Africa remain limited. Access to advanced vascular surgery and endovenous thermal ablation technologies is often restricted in many low- and middle-income countries due to cost, equipment requirements, and specialized training needs. In contrast, foam sclerotherapy can be performed using relatively simple equipment—primarily ultrasound guidance and sclerosant—making it a practical and scalable intervention in resource-constrained environments. The successful outcome observed in this patient with a longstanding ulcer highlights the potential for interventional radiology-based therapies to expand treatment options for chronic venous disease in Tanzania and similar settings. To our knowledge, this case represents one of the first reported uses of polidocanol foam sclerotherapy for the treatment of chronic venous ulceration in Tanzania, underscoring the growing role of minimally invasive vascular interventions in improving patient outcomes in the region.

CONCLUSION

This case demonstrates that ultrasound-guided polidocanol foam sclerotherapy can effectively treat chronic venous insufficiency and promote healing of longstanding venous ulcers. The successful outcome in this patient highlights the potential role of interventional radiology-based venous interventions in low-resource healthcare settings such as Tanzania. Broader adoption of these techniques may improve outcomes for patients with chronic venous disease where access to advanced surgical therapies is limited.

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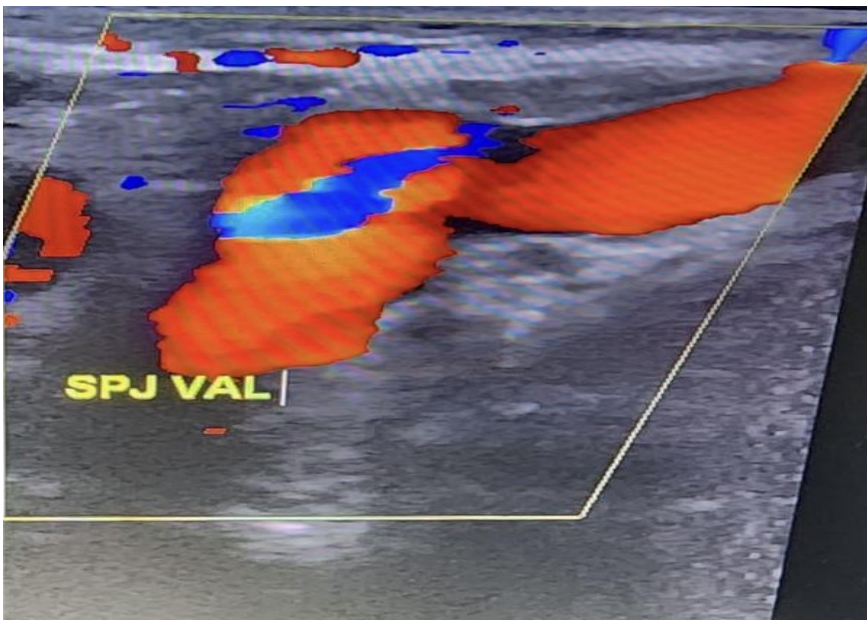


Figure 1(A): Color doppler ultrasound showing persistent flow at the saphenopopliteal junction (SPJ) during Valsalva maneuver.

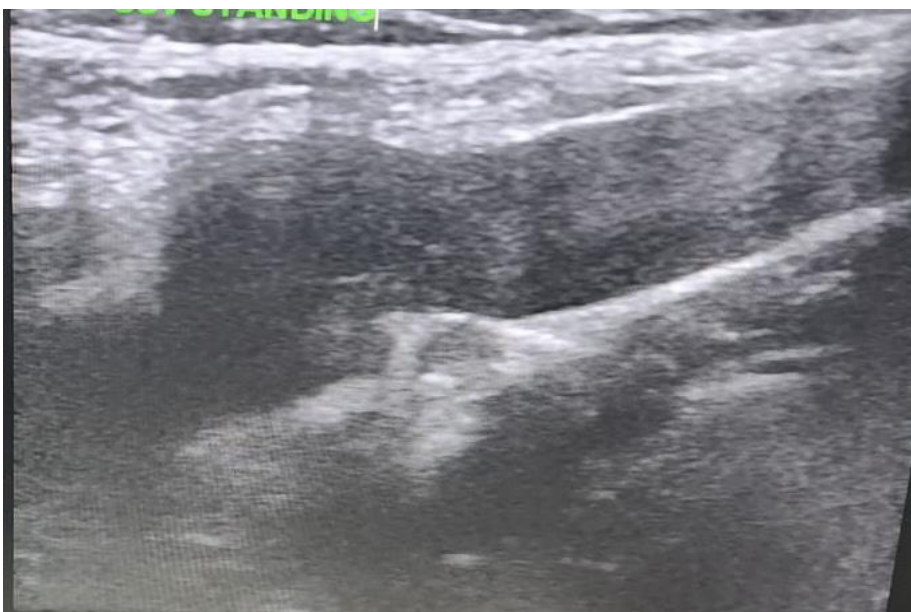


Figure 1(B): Ultrasound of the saphenopopliteal junction (SPJ) during valsalva showing patent junction with dilated saphenous vein.

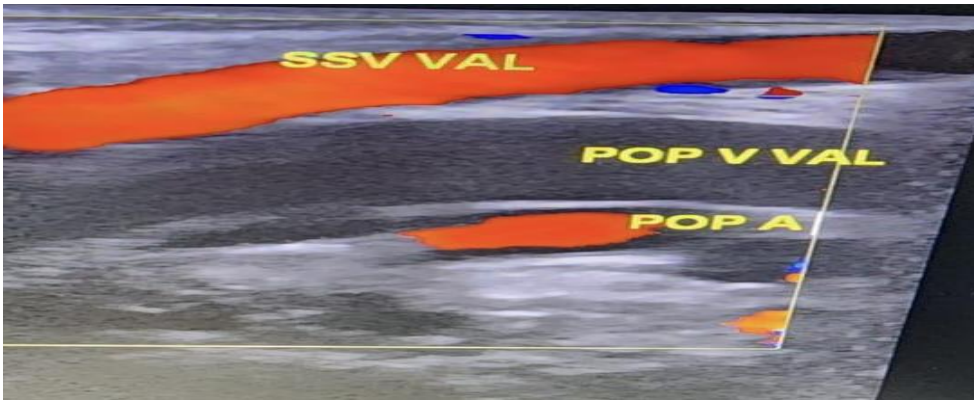


Figure 2: Color doppler ultrasound at the level of the popliteal vein showing maintained flow in the small saphenous vein (SSV) during valsalva maneuver.



Figure 3: Access into the small saphenous vein done at different spots under ultrasound guidance.

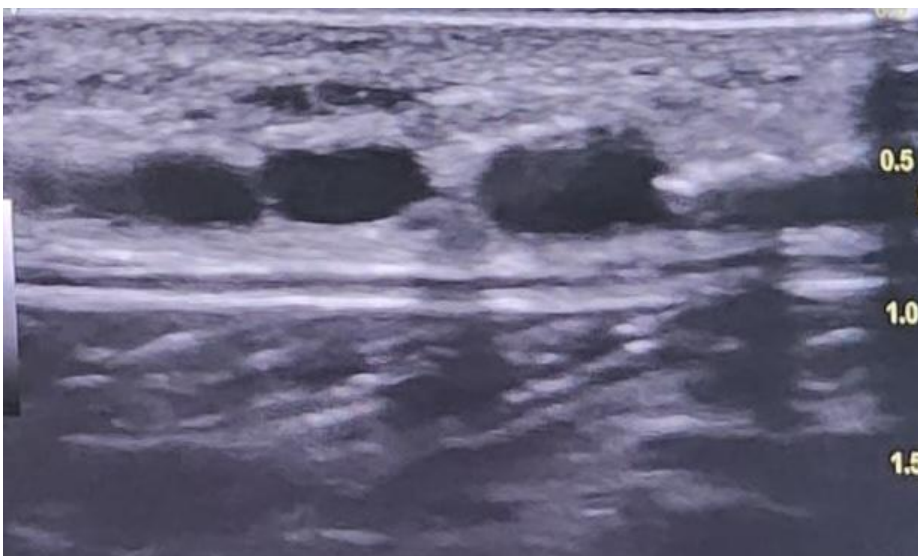


Figure 4: Ultrasound image confirming needle position into the small saphenous vein prior to sclerotherapy.



Figure 5 (A): Pre-sclerotherapy image showing ulceration on the lateral malleolar area



Figure 5 (B): 4 months post sclerotherapy showing complete healing of the ulcer.