

Chronic Lymphedema and Venous Stasis Ulceration in a Rural West Virginia Patient: A Case Report Highlighting Urgent Need of Quality Improvement in Rural Wound-Care Management due to Socioeconomic Disparities

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ABSTRACT: This report presents a 55-year-old male with chronic bilateral leg lymphedema and venous stasis ulcerations, whose condition was worsened by delayed vascular intervention. Imaging revealed critical bilateral common iliac vein stenoses greater than 70%. This case highlights the downstream effects of structural socioeconomic barriers on chronic disease outcomes in underserved Appalachian communities. ¹

KEYWORDS: Appalachian Community, Socioeconomic Status, Venous Ulcerations, Vascular Intervention.

1. INTRODUCTION

Chronic lymphedema and venous stasis ulceration are conditions that commonly present concurrently due to shared pathophysiological mechanisms. Chronic lymphedema is a clinical progression of impaired systemic lymphatic drainage, progressing to interstitial fluid accumulation, tissue fibrosis, and increased susceptibility to infections. ² Venous stasis ulcers, the most severe manifestation of chronic venous insufficiency, result from sustained venous hypertension, leukocyte activation, and microcirculatory dysfunction. ³ Together, these conditions create a cycle of inflammation, edema, and poor wound healing that significantly impacts quality of life. Management requires multidisciplinary care, including compression therapy, wound management, infection control, and, when indicated, vascular interventions to address underlying venous pathology. ⁴ However, access to such specialized care is often limited in rural regions, where socioeconomic barriers, transportation challenges, and healthcare resource shortages exacerbate disease progression. ¹ This case highlights how these systemic factors contributed to delayed vascular intervention in a patient with advanced chronic lymphedema and venous stasis ulceration in rural West Virginia.

2. CASE PRESENTATION

A 55-year-old Caucasian male with a BMI of 56.5 kg/m² presented with chronic bilateral lower extremity lymphedema and multiple nonhealing venous stasis ulcers. The patient was admitted for surgical debridement of his ulcerated wounds. Past medical history was notable for morbid obesity, type 2 diabetes mellitus, chronic lymphedema, obstructive sleep apnea, GERD, and recurrent soft tissue infections. He had been managing his wounds at home with limited resources and no consistent outpatient follow-up. The wounds, which were now foul-smelling and exudative, had developed over several months and progressively worsened despite his efforts. On examination, the patient was hemodynamically stable and afebrile. Both legs showed advanced stasis dermatitis, marked edema, and multiple ulcerated areas with surrounding erythema and fibrosis. Palpation revealed brawny induration consistent with chronic lymphedema. Laboratory tests were notable for hypoalbuminemia (2.1 g/dL), mild anemia, and poorly controlled blood glucose. Blood cultures grew extended-spectrum beta-lactamase (ESBL)-producing *Escherichia coli* and *Proteus mirabilis*. He was started on intravenous meropenem and placed on wound care protocols with local debridement and offloading measures. A venogram performed during hospitalization revealed greater than 70% stenosis in both common iliac veins. Cardiopulmonary clearance was obtained for endovascular stenting; however, procedural scheduling was delayed due to limitations in stent availability at the facility. The vascular team attempted to arrange transfer or outpatient follow-up at a larger center, but the patient lacked transportation, financial means, and social support to make such arrangements feasible. ⁵



3. PROGNOSIS

The patient's prognosis has clinically deteriorated by prolonged lack of quality wound care and impaired access to timely clinical care. These conditions are regularly prevalent in rural and underserved areas. In this case it is evident that lack of structured outpatient support, such as wound care awareness, enabled the ulcerations to deepen and progress to widespread infection. Vascular intervention delays further exacerbated the patient's venous hypertension. Impaired access to wound-care and vascular treatment created a case of chronic morbidity and widespread clinical complications.

4. DISCUSSION

This case underscores the complexities of managing chronic vascular conditions in resource-limited settings. The patient's clinical deterioration was not primarily due to delayed recognition but rather to systemic barriers: understaffed specialty services, limited procedural resources, and poor social infrastructure.⁵ Chronic venous disease, particularly when complicated by obesity and diabetes, requires longitudinal, multidisciplinary care.⁴ However, rural regions such as Beckley, West Virginia, often face limited access to care due to patients' socioeconomic realities.¹ This case also reflects broader public health concerns. Rural Appalachia continues to face disproportionate rates of diabetes, obesity, and cardiovascular disease. Healthcare workforce shortages, transportation barriers, and underfunded public health infrastructure exacerbates the burden.¹ For his patient, these issues converged to delay a necessary vascular intervention, leading to prolonged hospitalization and avoidable suffering.

5. QUALITY IMPROVEMENT

Improvement in patient outcomes presenting with chronic lymphedema and venous stasis in underserved regions such as rural Appalachian communities require significant quality improvement programs targeting clinical and education gaps. A notable factor to address in this case was the lack of wound care education in many individuals with chronic lymphedema and venous stasis. In response, during the patient's hospitalization an education outreach program was conducted by the care team to target health literacy in these patients. This informal effort included distribution of materials highlighting proper wound care, compression therapy, infection awareness, and importance of early vascular interventions.

As a result of this initiative, a major systemic deficiency was identified. It was identified that many patients experienced a drastic lack of knowledge in wound care and management. It illuminated that many rural patients lack the access to standardized information required to identify complications early and seek clinical care.

Constructing on this insight, future QI programs should target the development of standardized patient educational tools, and routine out-reach wound care management as the first step in preventing these complications. As initiated by the Beckley Appalachian regional hospital by their women's health outreach and ARH mobile care.⁶ Furthermore, establishing tele-medicine based wound care management to remotely monitor high-risk patients, and addressing transportation barriers by implementing mobile wound care centers, and medical transport programs aid in the improvement of continued care. Overall, a well organized combination of all these initiatives and programs would mitigate complications of chronic vascular diseases.

6. CONCLUSION

This case illustrates how structural inequalities in healthcare access, particularly in rural settings, can significantly impact the progression of chronic disease. Without interventions to improve access to specialty care, procedural resources, and social support systems, patients in communities like rural West Virginia will continue to face disproportionate burdens of preventable complications. Solutions may include mobile vascular units, expanded telemedicine services, and public policy efforts to close care gaps in rural America.^{1,5}

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8. ETHICAL STATEMENT AND CONFLICT OF INTEREST DISCLOSURE

Consent: Consent was provided and waived by all parties in this study.

Conflict of Interest: It is declared by all authors that no financial support was given by any organization in respect to this case report, and declared by all authors that no personal financial interest is associated with the submitted work.

Disclaimer: All measures were taken to not disclose any patient information that could lead to the revelation of their identity.

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