Pyoderma Gangrenosum Like Presentation of Venous Leg Ulcers: A Retrospective Case Series

Powell C, Lucas J, Gandy H, Adepu, N, Ramasamy P
University of South Carolina School of Medicine/Prisma Health Midlands

Background

- The development of venous leg ulcers (VLUs) is driven by chronic venous insufficiency (CVI), which leads to microcirculatory damage and eventual ulceration.
- PG is a rare type of neutrophilic dermatosis, characterized by painful and rapidly developing ulcers with irregular and erythematous-violaceous borders.
- Diagnosis of PG is challenging due to its variable clinical presentation and the absence of specific histological or laboratory findings.
- The potential intersection between these chronic ulcers and the pathological features of pyoderma gangrenosum (PG) creates a novel diagnostic and therapeutic challenge.
- There may be a novel inflammatory cascade, that acts like PG and warrants early recognition to allow for anti-inflammatory measures to be taken to allow for proven VLU treatments like compression therapy and debridement.

Objectives

- Elucidate our experiences with this wound pathology in seven patients who initially presented with VLUs but had a sudden ulcer progression.
- To bring awareness to this potentially undefined complication of venous leg ulcers.
- Reduce the diagnostic timeline and initiation of effective treatments and instigate other clinicians to report similar cases, all in hopes of reducing patient morbidity and suffering, and healthcare costs.

Methods

- Retrospective case series between October 2019 and June 2025.
- Patient charts were analyzed wound characteristics, relevant past medical history, Treatment progression throughout the wound progression, and timing of rapid wound deterioration with emphasis on biopsy results and physical exam.
- Data collection occurred chronologically, starting on the first day of presentation to the Outpatient Wound Care clinic.

Results

Case	Age	Sex	Initial wound location & duration	Pertinent PMH	Development of PG-behaving wound	Pathology	Wound therapy	Biologics	Steroids	Outcome
1	55	Female	Posterior right knee pressure injury; chronic ulcer history, presenting wound 1.4 × 2.3 × 0.2 cm; followed ~5 months before deterioration	Lymphedema, diabetes mellitus, spina bifida, hypertension, chronic LE ulcers, left AKA	After ~5 months wound rapidly enlarged to 5.5 × 5 × 0.1 cm with erythema and sloughing; progressed further to 6.5 × 5 × 1.5 cm with necrotic tissue	Biopsy: epidermal ulceration, reactive epidermal hyperplasia, dermal fibrosis with mixed inflammatory infiltrate; nonspecific; second biopsy negative for PG	Saline dressings, silver calcium alginate, selective debridement, saline wet-to-dry dressings, wound vac	Adalimumab	Prednisone; topical tacrolimus; later clobetasol and triamcinolone to wound edges	Marked improvement after biologic initiation; complete wound healing at ~8 months after PG diagnosis
2	74	Female	Bilateral distal pretibial venous leg ulcers present 4 months	Chronic renal disease, pulmonary hypertension, stage III CKD	Rapid deterioration of right pretibial wound to 11.2 × 8 cm with severe pain after medication change	Two biopsies inconclusive for PG	Compression therapy, sharp debridement, silver calcium alginate, local wound care	Adalimumab	Prednisone attempted but discontinued due to intolerance; topical steroids (clobetasol, triamcinolone)	Improvement with biologic therapy; healthy granulation and epithelization; successful full-thickness skin graft with continued healing
3	67	Female	Right proximal/posterior calf venous leg ulcer present several months	CAD, CHF, thyroid disease	Wound with violaceous border and yellow slough enlarged from 3.7 × 3.5 cm to 5 × 5.7 cm with severe pain and necrosis	Biopsy nonspecific (possible effect of prednisone); clinical diagnosis of PG	Debridement, gentamicin ointment, nitroglycerin to edges, Aquacel AG dressing, compression therapy	Adalimumab	Prior prednisone; cyclosporine while awaiting biologic	Initial improvement after adalimumab; later variable course with deterioration reported
4	69	Female	Chronic right dorsal foot venous ulcer present 3 years	Venous stasis, diabetes mellitus, lymphedema, prior PG after knee replacement	Rapid deterioration with deep tissue involvement and severe pain	Clinical diagnosis after ruling out infection	Gentamicin ointment, compression therapy, collagen dressing, local wound care, selective debridement	Previously adalimumab; trial of infliximab; later IVIg	Tacrolimus topical; prior systemic steroids	Dramatic improvement after dalbavancin + IVIg; medial ankle wound epithelized and dorsal wound reduced significantly
5	58	Female	Left pretibial ulcer 1 month after minor trauma	Poorly controlled type 2 diabetes, CKD, CHF, spinal stenosis, atrial fibrillation (on apixaban)	Severe pain, violaceous borders, progressive inflammation and slow healing despite therapy	Initial biopsy nondiagnostic; repeat biopsy showed epidermal acanthosis, hyperkeratosis, scattered dermal neutrophils	Compression therapy, Medihoney, collagenase (Santyl), topical timolol, Apligraf grafts	None	Topical clobetasol	Gradual healing with grafts and compression; complete closure with scarring
6	53	Male	Chronic distal leg ulcer 9 months	Hypertension, hyperlipidemia, uncontrolled diabetes, CAD, history of lupus/discoid lupus	Pathergy with new lesions at adhesive sites; chronic nonhealing ulcer	Shave biopsy showed neutrophils concerning for PG; repeat biopsy negative (likely due to steroid use)	Medihoney dressings, compression therapy, collagen therapy, placental tissue graft with stem cells	None	Topical steroids and intralesional triamcinolone	Significant improvement with grafting; final diagnosis revised to venous stasis ulcer with PG features
7	85	Female	Right lower extremity ulcer 9 months after trauma	Sjögren's syndrome, hypertension, peripheral vascular disease, chronic venous stasis	Worsening ulcer 6.4 × 4.1 × 0.6 cm with slough and pain	Biopsy: dense dermal neutrophilic infiltrate concerning for PG	Compression therapy, collagen dressings, TheraSkin and Apligraf grafts, selective debridement	Adalimumab (Humira)	Oral steroid taper; topical clobetasol	Gradual improvement with biologics and grafts; slow but progressive healing

Table 1. Clinical Characteristics, Treatments, and Outcomes of Patients With Pyoderma Gangrenosum–Like Wounds

Example Case 1:

A 69-year-old female with lower extremity venous stasis, diabetes mellitus, and lymphedema with non-healing venous ulcer of right dorsal foot.

- Right dorsal foot ulcer with a 3.2 cm by 1.8 cm wound bed, characterized by a dark red discoloration and extreme pain. (Figure 1)
- Deterioration: Two months after presentation her wounds significantly deteriorated. (Figure 2)
- Treatment: Three IV-immunoglobulins treatments. After inflammation suppression, selective level debridement of superficial necrosed tissue was performed.
- Resolution: On follow up one month later the wounds showed dramatic improvement (Figure 3), and the patient reported much less pain. Selective level debridement of superficial necrosed tissue was performed. Within two weeks, the wound showed epithelization and vascularized wound bed.

Figure 1: initial presentation.

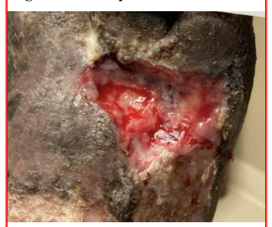

Figure 2: deterioration.

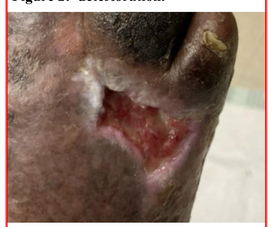

Figure 3: improvement

Example Case 2:

A 55-year-old female with a history of lower extremity lymphedema, diabetes mellitus, spina bifida, hypertension, and a long history of chronic lower extremity ulcers, presented to the wound care clinic with an epithelialized pressure injury to the posterior right knee

- Right posterior knee with wound measuring 1.4cmx2.3cmx.2cm (Figure 1). Treated with silver ca alginate
- Deterioration: Five months after presentation, the patient's wounds significantly deteriorated (Figure 2).
- Biopsy with concern for PG, further rapid deterioration despite abx (Fig 3).
- Treatment: Topical tacrolimus and biologic treatment was started with adalimumab.
- Resolution: On follow up two months later the wounds showed dramatic improvement, and the patient reported much less pain. Eight months after diagnosis her wound was completely healed (Figure 4) with continued adalimumab injections and wound vac.

Figure 1: initial presentation.

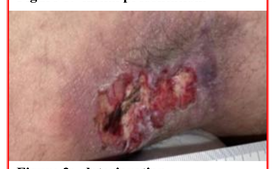

Figure 2: deterioration.

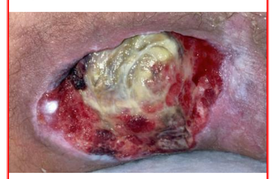

Figure 3: rapid progression.

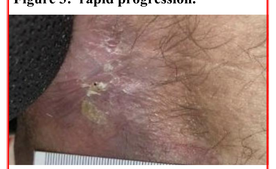

Figure 4: improvement.

Discussion

- Leukocyte recruitment results from increased endothelial stress, causing the release of vasoactive agents, inflammatory mediators, chemokines, and adhesion molecules.[1]
- The translocation of leukocytes through the venous endothelium initiates an inflammatory response.
- The pathophysiology of PG is not well understood, many pro-inflammatory cytokines are indicated, including TNF-α, IL-1α, IL-8, IL-12, IL-15, IL-17, IL-23, and IL-36.[2]
- The present cases suggest that a complex entity exists in patients diagnosed with CVI and VLUs.
- The patients presented were diagnosed with VLUs due to CVI; however, the wound behavior and response to biologics and immunosuppressants indicate a more complex underlying process.
- The literature lacks a well-defined pathology that encompasses the characteristics our patients' chronic wounds, although several studies on VLUs and PG reveal overlapping clinical correlations.

Conclusion

- PG is a complex condition which lacks clear diagnostic criteria. The overlap between PG features and pre-existing VLUs raises the possibility of a distinct but related pathology. This proposed entity develops in chronic venous wounds and is linked to CVI pathogenesis but includes an inflammatory response that mimics a PG: extreme pain, rapid wound deterioration, and delayed healing. This inflammatory response requires the use of immunosuppressants and biologics in order to increase the efficacy of more traditional VLU treatments, like compression and debridement.

References

1. Comerota A, Lurie F. Pathogenesis of venous ulcer. *Semin Vasc Surg*. 2015;28(1):6-14. doi:10.1053/j.semvascsurg.2015.07.003
2. Ortega-Loayza AG, Nugent WH, Lucero OM, Washington SL, Nunley JR, Walsh SW. Dysregulation of inflammatory gene expression in lesional and nonlesional skin of patients with pyoderma gangrenosum. *Br J Dermatol*. 2018;178(1):e35-e36. doi:10.1111/bjd.15837
3. Braswell SF, Kostopoulos TC, Ortega-Loayza AG. Pathophysiology of pyoderma gangrenosum (PG): an updated review. *J Am Acad Dermatol*. 2015;73(4):691-698. doi:10.1016/j.jaad.2015.06.021