**CLINICAL VIGNETTE**

# Leukocytoclastic Vasculitis in a Patient with Insulin-dependent Diabetes

Sean Faulk, BS, Senxi Du, MD, MPH and Patrick Poquiz, MD

***Case Description***

A 57-year-old woman with rheumatoid arthritis on methotrexate, pulmonary hypertension, and poorly controlled diabetes mellitus on insulin presented to the emergency department with 3 weeks of worsening dyspnea, fever, pleuritic chest pain, bilateral wrist pain, and a purpuric distal extremity rash. She also noted three weeks of diaphoresis and malaise associated with two infliximab infusions for rheumatoid arthritis. Upon arrival she was afebrile with normal blood pressure of 123/66 and 92% RA oxygen saturation. She met SIRS criteria with tachycardia with a heart rate of 121 and tachypnea with respiratory rate of 40. Physical examination was also notable for accessory muscle use, and a non-blanching purpuric rash on bilateral feet extending up to the buttocks. Complete blood count was unremarkable but comprehensive metabolic panel included elevated creatinine at 1.22 mg/dL, consistent with prerenal etiology, and an anion-gap metabolic acidosis. Urinalysis revealed mild proteinuria and microhematuria, similar to prior testing. Initial infectious evaluation was negative, including COVID-19, influenza, HIV, and MRSA nares. Rheumatologic testing revealed positive anti-dsDNA, positive anti-Smith antibodies, and low C3 levels, with negative ANCA, anti-GBM, cryoglobulins, and IgA. A transthoracic echocardiogram showed worsened pulmonary hypertension compared to a previous admission with pulmonary artery systolic pressure 66 mmHg, compared to 48 mmHg previously. During the hospitalization she became hypoxic which did not respond to initial oxygen supplementation and escalated to high flow nasal cannula. She also started empiric intravenous antibiotics for bacterial pneumonia. Because of her unusual rash, dermatology performed a skin biopsy showing leukocytoclastic vasculitis (LCV). Rheumatology felt her constellation of findings was consistent with rheumatoid arthritis/systemic lupus erythematosus overlap syndrome given leukopenia, joint involvement, low C3, and anti-dsDNA. Antibiotics were discontinued, and she was treated with IV methylprednisolone for 3 days with marked improvement in symptoms and hypoxia. She was discharged home on an oral prednisone taper with follow-up scheduled with primary care, rheumatology and pulmonology. Her insulin regimen was modified with tapering instructions to allow adequate coverage for hyperglycemia for the duration of the steroid taper.

Two weeks after discharge, she was readmitted to the intensive care unit for diabetic ketoacidosis (DKA) and Fournier's gangrene of the perineum arising from a progressively worsening sacral ulcer. She reported multiple ulcers with accompanying purulent drainage, pain, fevers, and diarrhea. She was treated with multiple surgical debridement and antibiotics. Her home methotrexate was held and prednisone dose reduced to facilitate wound healing. She required an insulin drip for DKA followed by optimization of her insulin regimen and glucose levels. She was discharged with oral antibiotics, a reduced prednisone dose, and continued wound care. Two months later, she was seen in general surgery clinic with appropriate recovery.

***Discussion***

LCV is a cutaneous small-vessel vasculitis characterized by palpable purpura in the lower extremities, often triggered by drugs, infection, or autoimmune disease.[1-4] The incidence of LCV is estimated to be 45 per million, most commonly impacting adults.[1] While often self-limited with minimal extracutaneous involvement, it may be complicated by persistent ulceration and renal involvement that may progress to other complications including overlying infection.[2-6]

LCV is classically defined by crops of symmetric palpable purpura to dependent lower extremities, but may include other cutaneous features. A multivariate analysis of 160 patients with LCV reported palpable purpura (89.2% of cases), necrosis (30.4%), ulcers (20.3%), and pustules (16.5%)/ Systemic involvement was found in 20% of cases.[3] Important signs of extracutaneous vasculitis include systemic constitutional symptoms, arthralgias, myalgias, hematuria, paresthesia, weakness, pleuritis, and sinusitis.[1-4] Our patient reported arthralgias and weakness in addition to significant dyspnea and pleuritic chest pain, suggesting systemic disease.

Initial laboratory evaluation for isolated cutaneous vasculitis generally includes CBC with differential, chemistry profile, liver function tests, and urinalysis to assess for potential systemic involvement or causes. However, further studies are indicated in the setting of chronic or recurrent disease, unclear cause, or findings of systemic involvement on history or exam.[2] Skin biopsy is needed for definitive diagnosis, though cannot provide clarity on etiology.[2-6] Biopsies should ideally be done within 24-48 hours. Otherwise, immune complexes may dissipate and histopathology becomes nonspecific.[2]

A single episode of isolated cutaneous vasculitis without systemic involvement can be treated supportively, with oral antihistamines and NSAIDs as necessary.[2-6] The mainstay of

treatment for widespread, symptomatic, or ulcerative/necrotic disease is oral steroids, though colchicine and dapsone can be considered for chronic LCV.[4-6] LCV symptoms typically resolve in <6 months for about half of cases, with 8% with successive crops for more than 10 years.[3]

Despite a low mortality rate (<2%),[3] LCV can result in a number of complications, the most common being ulcers and renal involvement. The progression of necrosis into ulcers often causes impaired wound healing due to vessel destruction, which can lead to overlying infection.[2-6] The presence of ulcerative lesions requires administration of a short course of oral corticosteroids.[2-6] While not present in this particular case, another common complication of LCV is nephritis, often associated with severe abdominal pain, arthralgias, and persistent purpura. Significant proteinuria above 1-2 grams per 24 hours generally indicates the need for renal biopsy and immunosuppressive therapy.[6]

We present a complex case of a patient with diabetes mellitus and rheumatoid arthritis who developed LCV with extracutaneous involvement and sacral ulcer progression, further complicated by overlying Fournier's of the perineum. Despite increased insulin dosing for steroid-induced hyperglycemia, the patient still developed DKA. This case demonstrates the difficult balance that can arise when treating certain rheumatologic diseases in patients with severe diabetes. Intravenous steroid therapy may be necessary for severe cases of LCV with dangerous systemic involvement. For ulcerative LCV and many other rheumatologic conditions, oral steroid therapy remains the cornerstone of treatment. However, for patients with diabetes, whether insulin-dependent or not, steroid-induced hyperglycemia can lead to life-threatening complications. This case highlights the importance of close follow-up and management of comorbidities for the immunocompromised patient, particularly for patients with diabetes discharged on steroids. Our patient might have benefitted from formal diabetes education to review her insulin taper and to learn home sliding scale insulin. Proper wound care, thorough skin exams, education, and close follow-up are essential to reducing the risk of overlying infection and preventing prolonged hospital admissions. This case also highlights the importance of smooth transitions of care and timely follow-up with a primary care physician to ensure issues from hospitalization continue to be addressed.

In summary, LCV is an inflammatory skin condition with variable presentations and etiologies. Initial diagnostic evaluation should include a CBC, CMP, and urinalysis to evaluate for systemic manifestations, while skin biopsy is required for definitive diagnosis. Patients with systemic symptoms should be sent to the hospital for steroid treatment and supportive care. Despite a low mortality rate and predominantly self-resolving disease course, management may require oral steroid therapy if complicated by ulcerative lesions or renal involvement. However, patients with significant comorbid conditions who receive steroid therapy require close follow-up for potential complications.

## REFERENCES


1. **Baigrie D, Goyal A, Crane JS**. Leukocytoclastic Vasculitis. 2023 Aug 8. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 29489227.
2. **Goeser MR, Laniosz V, Wetter DA**. A practical approach to the diagnosis, evaluation, and management of cutaneous small-vessel vasculitis. *Am J Clin Dermatol*. 2014 Aug;15(4):299-306. doi: 10.1007/s40257-014-0076-6. PMID: 24756249.
3. **Sais G, Vidaller A, Jucglà A, Servitje O, Condom E, Peyri J**. Prognostic factors in leukocytoclastic vasculitis: a clinicopathologic study of 160 patients. *Arch Dermatol*. 1998 Mar;134(3):309-15. doi: 10.1001/archderm.134.3.309. PMID: 9521029.
4. **Carlson JA, Ng BT, Chen KR**. Cutaneous vasculitis update: diagnostic criteria, classification, epidemiology, etiology, pathogenesis, evaluation and prognosis. *Am J Dermatopathol*. 2005 Dec;27(6):504-28. doi: 10.1097/01.dad.0000181109.54532.c5. PMID: 16314707.
5. **Xu LY, Esparza EM, Anadkat MJ, Crone KG, Brasington RD**. Cutaneous manifestations of vasculitis. *Semin Arthritis Rheum*. 2009 Apr;38(5):348-60. doi: 10.1016/j.semarthrit.2008.01.007. Epub 2008 Mar 20. PMID: 18355896.
6. **Sunderkötter C, Bonsmann G, Sindrilaru A, Luger T**. Management of leukocytoclastic vasculitis. *J Dermatolog Treat*. 2005;16(4):193-206. doi: 10.1080/09546630500277971. PMID: 16249140.