Gouty panniculitis: A case series

Nicole A. Negbenebor, MD,[a] Aubrey Allen Hess, MD,[b] Christopher DiMarco, MD,[a] Leslie Robinson-Bostom, MD,[a] Hongmei Li, MD, PhD,[c] Oluwakemi Onajin, MD,[d] and Omar P. Sangueza, MD[d]
Providence, Rhode Island; Greenville, North Carolina; and Winston-Salem, North Carolina

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Gouty panniculitis is a rare type of lobular panniculitis that develops when uric acid crystals are deposited in subcutaneous tissue, which may precede or appear subsequently in the setting of chronic tophaceous gout.[1,2] The pathogenesis is not fully understood, but it has been postulated that overproduction and accumulation of uric acid are triggered by subcutaneous tissue damage and localized inflammation.[2] Herein we report three cases of diffuse gouty panniculitis.

This is a retrospective clinical review of three patients with gouty panniculitis. One was seen by the dermatology service at the Wake Forest Baptist Medical Center, and two were seen at the Warren Alpert Medical School of Brown University. Two patients were male and one was female, with an average age of 51 years. In all cases, the diagnosis of gouty panniculitis was made by biopsy and histologic examination. One patient had no known history of gout. Two patients had a history of gout, and one of these patients had been previously treated with febuxostat. We performed this study with the intention of examining the presentation and analyzing the clinical characteristics of each case.

CASE REPORTS

Case 1

A 68-year-old woman presented with a 2-year history of large, firm, hyperpigmented plaques on the bilateral upper and lower extremities and a 20-year history of progressive joint pain and deformity involving the hands and feet. The physical examination revealed bilateral lower-extremity edema with multiple dusky pink to dark-brown, firm, indurated plaques with several overlying 1-cm superficial ulcerations (Fig 1). A punch biopsy from the right forearm grossly demonstrated hard, white, chalky material throughout the dermis and subcutaneous tissue. Histologic examination demonstrated deep dermal and subcutaneous deposits of feathery pink, needle-shaped crystals with surrounding granulomatous inflammation, consistent with gouty panniculitis. The crystals were birefringent on polarizing microscopy. Her past medical history included diabetes mellitus, hypertension, and polycythemia vera. She had a 20-year history of arthritis, which was initially diagnosed as seronegative rheumatoid arthritis. She was treated sequentially with methotrexate, infliximab, prednisone, and certolizumab. She denied alcohol use and a family history of gout or renal disease. The laboratory results showed a serum uric acid level of 8.5 mg/dL (reference range, 2.6 to 6.0 mg/dL). Complete metabolic panel and complete blood cell count with differential were within normal ranges. Treatment with 100 mg of allopurinol daily was initiated and gradually increased to 600 mg daily. The serum uric acid level decreased to 5.0 mg/dL over 2 years, and she reported a significant improvement in joint pain on the follow-up visits.

Case 2

A 49-year-old man presented with a 10-year history of asymptomatic, widespread, hyperpigmented and indurated nodules and plaques involving the bilateral lower extremities (Fig 2). Physical examination showed multiple dark macules and nodules involving the shins and thighs and some nodular areas without overlying skin changes on the upper extremities. Punch biopsy of the right lower

From the Warren Alpert Medical School of Brown University, Providence[a]; the East Carolina University Brody School of Medicine, Greenville[b]; DermDx, New England, LLC[c]; and the Wake Forest School of Medicine, Winston-Salem.[d]
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Correspondence to: Nicole A. Negbenebor, MD, 593 Eddy Street, Providence, RI 02903. E-mail: nicole_negbenebor@brown.edu.

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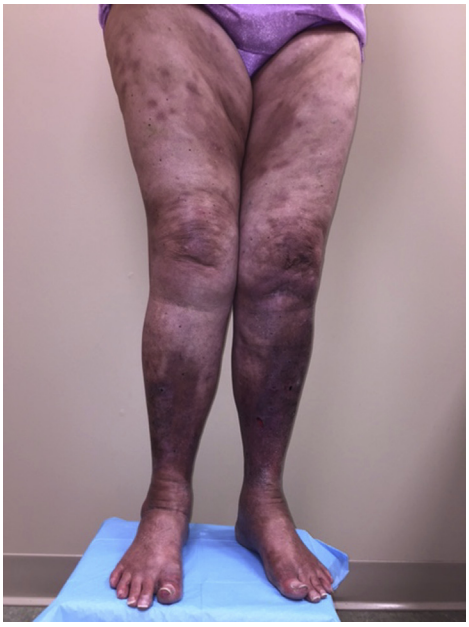

Fig 1. Dusky pink to brown indurated plaques with overlying superficial ulcerations.

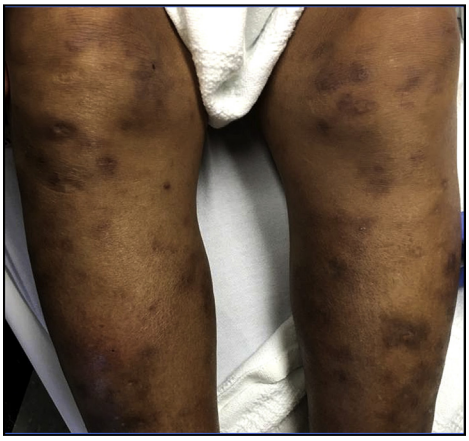

Fig 2. Hyperpigmented and indurated nodules and plaques.

leg was performed, which showed extensive palisading granulomatous inflammation surrounding pink to gray amorphous feathery material in the deep dermis and subcutaneous fat (Fig 3). His past medical history included hypertension, diabetes mellitus, chronic kidney disease, and gout. The patient reported that the rash had been intermittent over the past 10 years, with occasional swelling and eruption of the lesions. The patient stated that the lesions on his thighs were older than those on his shins and that the rash was worse before he started to take febuxostat for gout. At this presentation, he had a serum uric acid level of 7.8 mg/dL. The patient was restarted on febuxostat 80 mg.

Case 3

A 36-year-old man presented with an 8-year history of painful nodules on the face, abdomen, and back. Three years earlier, painless ulcers with yellow drainage overlying the nodules began to develop. He reported a prior diagnosis of gout but had no other past medical history. The patient self-bandaged the wounds without seeking medical care and presented when he could not keep up with bandaging. Physical examination showed red to yellow firm nodules over the hands, digits, arms, legs, and helices. The right thigh had a larger, hyperpigmented, indurated plaque with adjacent ulcerations with white material within and serosanguinous drainage (Fig 4). Punch biopsy of the right medial thigh showed palisaded granulomas with central aggregates of pink, homogenous material suspicious for gout within the dermis and septa of the subcutaneous fat. His initial serum uric acid level was 12.1 mg/dL. The patient was started on oral prednisone and allopurinol for treatment along with topical xeroform for the ulcers. The patient experienced improvement but had many recurrences when he missed treatment.

DISCUSSION

Although gouty tophi are common, gouty panniculitis is a unique and unusual complication of gout in which monosodium urate crystals are deposited within dermal and subcutaneous tissue. The pathogenesis of gouty panniculitis is unclear, although it has been associated with hyperuricemia and the presence of subcutaneous plaques that may precede the development of the articular clinical expression of tophaceous gout.[2] Stasis dermatitis and previous subcutaneous tissue damage may be predisposing factors that allow for inflammation and blood vessel microtrauma.[2] Review of the current literature in addition to the cases presented suggests that gouty panniculitis tends to affect the lower extremities. However, there have been cases involving the nose.[3-5] Two of our patients presented with upper and lower-extremity panniculitis, suggesting that stasis of blood flow in the lower legs is not the only predisposing factor to gouty panniculitis. As in our patients, gouty panniculitis appears as indurated, erythematous nodules or plaques with or without pain, which can result in ulceration of the overlying skin and drainage of serous fluid with positive crystals. Our first patient presented with superficial ulcerations, whereas our third patient had severe ulcers, suggesting that there may be a wide range of severity of the presenting skin lesions. The clinical variability of gouty panniculitis has been described, with cases ranging from nontender,

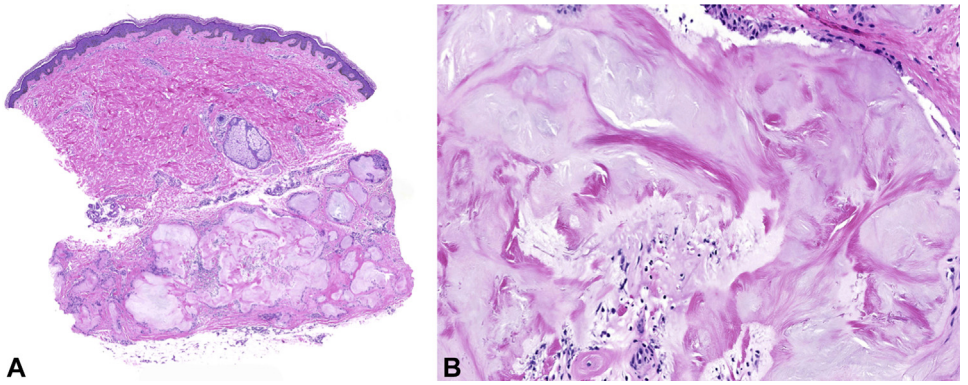

Fig 3. **A** and **B**. Palisading granulomatous inflammation surrounding pink to gray amorphous feathery material in the deep dermis and subcutaneous fat. **A**, Low power view of palisading granulomatous inflammation surrounding pink to gray amorphous feathery material in the deep dermis and subcutaneous fat. **B**, High power view of the deep dermal amorphous pink, feathery deposits.

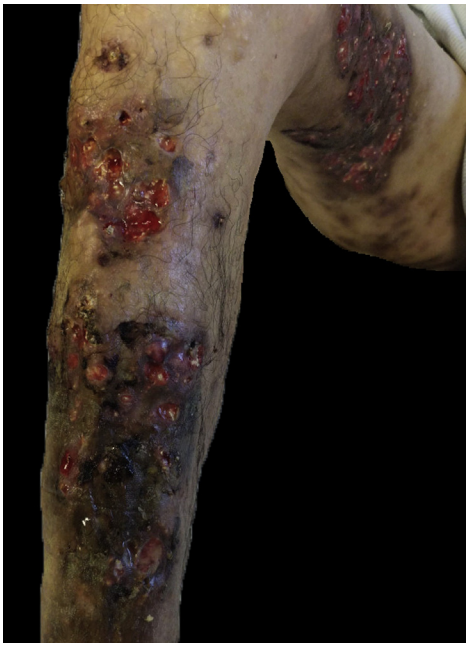

Fig 4. Hyperpigmented, indurated plaque with ulcerations containing white material and serosanguinous drainage.

subcutaneous nodules to ulcerations with exudate.[2] The cutaneous lesions may precede, manifest with, or appear years after the onset of gout. Although all of our patients presented with elevated uric acid levels, cases have been reported with uric acid levels within the normal range, suggesting that hyperuricemia may not be sufficient for the development of gouty panniculitis.[6] Chronic renal insufficiency associated with hypertensive nephropathy may also be a risk factor for the deposition of monosodium urate crystals into the subcutaneous tissue.[2]

Gouty panniculitis may have a gradual onset, as evidenced by our patients whose cutaneous manifestations had been present for 2, 8, and 10 years before diagnosis. Previous literature has suggested that the average time to diagnosis is measured in years, which implies a chronic progressive disease course with a difficult diagnosis.[6]

The diagnosis of gouty panniculitis depends on histopathology, in which fixation in alcohol and anhydrous processing reveals the key features of the urate crystals. Routine formalin fixation and hematoxylin-eosin staining can wash out the crystals. Histopathologic examination of gouty panniculitis will reveal needle-like urate crystals with typical feathering and a granulomatous reaction with histiocytes and multinucleated giant cells.[6]

Clinical differential diagnoses that should be considered include lobular panniculitis without vasculitis, such as autoimmune disease, panniculitis associated with malignancy, and panniculitis associated with calcium deposition in patients on hemodialysis. Other disorders that must be ruled out include cellulitis, pseudogout, oxalosis, calciphylaxis, and lupus panniculitis.[2,7]

A standardized treatment for gouty panniculitis has not been established, given the rarity of this entity. Therapy consists of agents to manage hyperuricemia. Some reports indicated that treating patients with allopurinol up to 600-1200 mg/day and colchicine not only improved the lesions but also stopped the formation of new lesions. Low-dose, short-term systemic steroids, such as prednisone 10 mg/day, can be given to control inflammation and pain.[2] It is reasonable to recommend that drugs that may increase serum uric acid, such as thiazide and loop diuretics, niacin, and low-dose (<3 g/day) salicylic acid, should be avoided in patients with gouty panniculitis if possible.

In conclusion, gouty panniculitis may not be obvious to the clinician because of the rarity of the disease and the gradual onset of findings. However, slow development of subcutaneous tissue nodules or plaques in the setting of hyperuricemia should indicate a possible diagnosis of gouty panniculitis. With or without gouty arthritis, gouty panniculitis should be suspected in patients with chronic gout or hyperuricemia who begin having cutaneous manifestations, as described in this case series. When considering this diagnosis, the clinician may ask the histopathologist for a fixation technique that facilitates proper diagnosis. These patients should then have close clinical monitoring or further workup for systemic disease.

Conflicts of interest

None disclosed.

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