Disseminated cutaneous gout: a rare manifestation of a common disease

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Abstract

Disseminated cutaneous gout is a rare atypical cutaneous manifestation of gout in which widespread dermal and subcutaneous tophi develop at extra-articular body sites. Given the lack of joint involvement that is typically a feature in tophaceous gout, the diagnosis may not be initially suspected. We present the case of a 50-year-old Hispanic man with poorly controlled gout who was evaluated for several years of firm papulonodules over the trunk and upper and lower extremities, sparing the joints; histopathology confirmed, the diagnosis of disseminated cutaneous gout. Per our literature review, disseminated cutaneous gout presents with polymorphous papules and nodules that can mimic other, more common cutaneous diseases. There is a preponderance of cases in males, Asians, and patients with longstanding gout. The lower extremities are involved in nearly all reports. Uric acid-lowering therapy with allopurinol has been reported to decrease the size and number of lesions in a minority of treated patients.

Keywords: cutaneous manifestations of systemic disease, rheumatologic disorders, gout, diagnosis

Introduction

Gout is a common inflammatory arthritis caused by deposition of monosodium urate (MSU) crystals in synovial fluid and other tissues. Hyperuricemia, usually related to renal underexcretion, is the essential precondition for gout. In advanced or untreated gout, tophi (collections of MSU crystals with associated inflammation) can form near joints, bones, tendons, and the external ear [1]. We present a case of disseminated cutaneous gout, a rare atypical cutaneous manifestation of gout.

Case Synopsis

A 50-year-old obese man with a history of colon adenocarcinoma and chronic gouty arthritis, nonadherent to medication and lifestyle interventions, presented to the emergency department complaining of worsening redness following incision and drainage of a painful skin lesion on the left calf. He reported multiple additional lesions over his trunk, arms, and legs of several years' duration, as well as chronic diffuse arthralgias. He was febrile and tachycardic and was found to have leukocytosis (16.2×10^9/L; normal range, 4.5-10.0) with neutrophilic predominance (79.4%). Owing to concern for cellulitis, broad-spectrum antibiotics were initiated and he was admitted for further management. Blood and superficial wound cultures were negative. Workup revealed elevated serum uric acid (9.3mg/dL; normal range, 4.0-8.1), which was unchanged from six months earlier. X-rays of the upper and lower extremities showed arthritic changes, without evidence of tophi. A rheumatology consultant determined there was no acute gout flare and recommended naproxen administration and restarting colchicine and febuxostat. As his skin

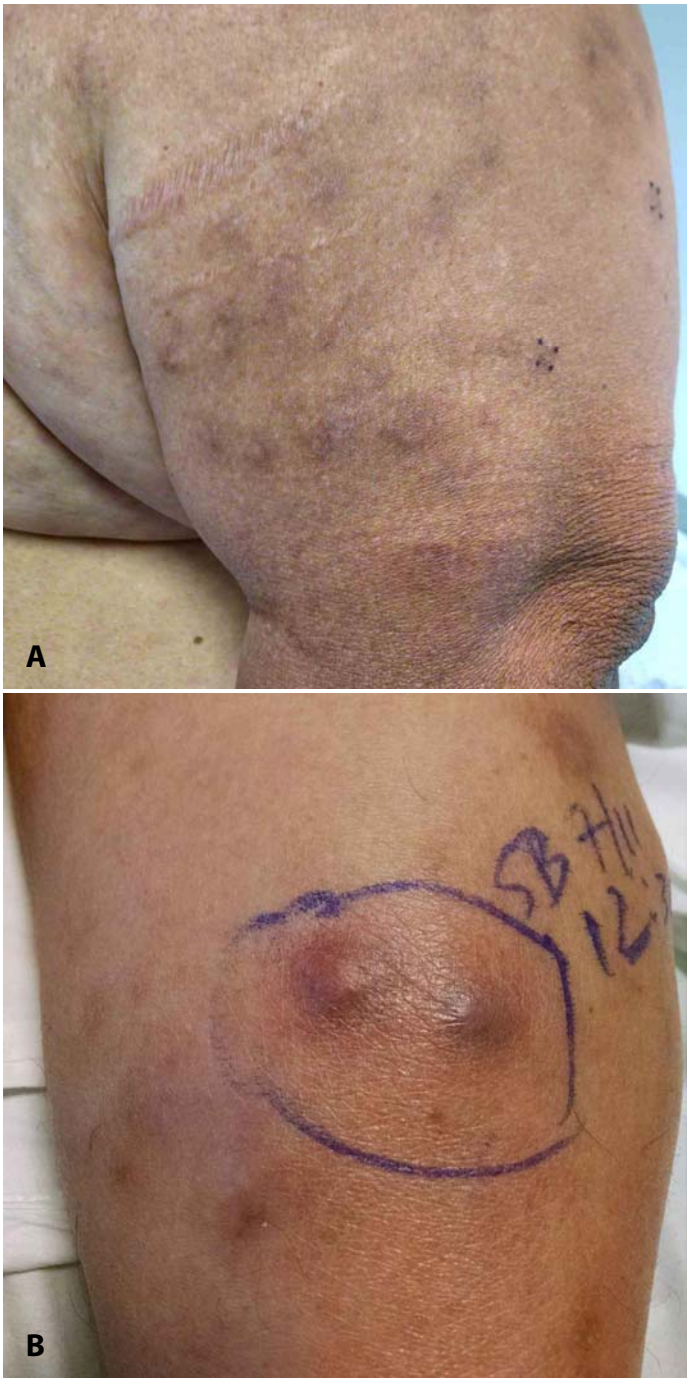

Figure 1. *Multiple hyperpigmented to erythematous firm papulonodules at extra-articular sites on the **A)** upper and **B)** lower extremities.*

lesions were not typical of gout, dermatologic evaluation was recommended.

Examination was significant for multiple mildly tender, erythematous to hyperpigmented, firm papulonodules on the bilateral flexor and extensor upper and lower extremities and abdomen; no lesions were located over joints (**Figure 1**). During the consultation, a family history of colon cancer was elicited in the patient's sister, raising concern for pilomatricomas or calcified epidermal inclusion cysts associated with Gardner syndrome. Upon punch biopsy, there was extrusion of a chalky white

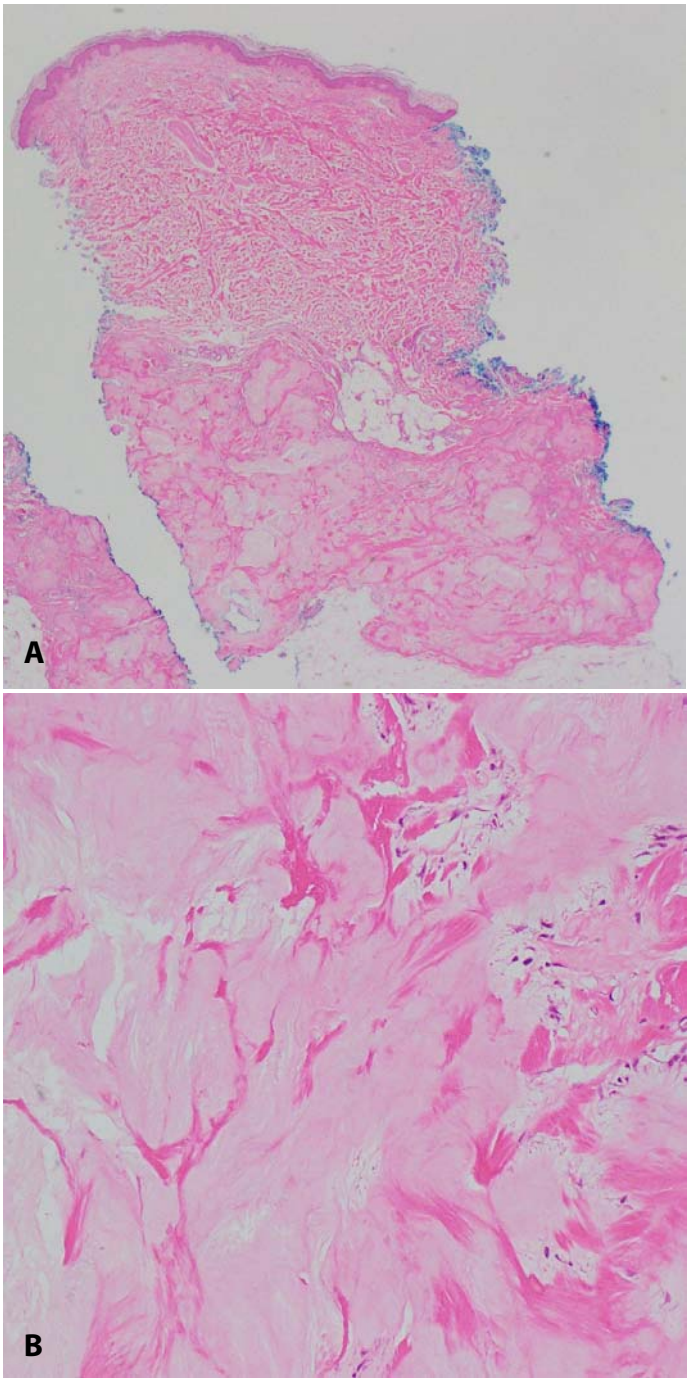

Figure 2. ***A)** Punch biopsy revealed deposition of amorphous pink material throughout the mid to deep dermis on low power. H&E, 10×. **B)** High-power image showing extension into the subcutaneous septae. H&E, 40×.*

substance without malodor. On histopathologic examination, there was deposition of amorphous pink material throughout the deep dermis extending into the subcutaneous septae (**Figure 2**), consistent with gout. A diagnosis of disseminated cutaneous gout was made. On follow-up nine months later, there was no significant improvement in the patient's skin lesions while on colchicine and febuxostat.

Case Discussion

Disseminated cutaneous gout is a rare cutaneous manifestation of gout in which widespread dermal and subcutaneous tophi form at extra-articular sites [2]. In some instances, the term miliarial gout has been used to describe cases featuring diffuse milia-like papules [3]. Given its varied clinical morphologies, the differential diagnosis can also include calcinosis cutis, rheumatoid nodules, foreign body granulomas, and eruptive xanthomas [4]. The pathogenesis is poorly understood. In our review of 23 reported cases of extensive extra-articular dermal/subcutaneous tophi (including the present case), [2-18], the majority of patients were male (87%) and Asian (57%), (**Table 1**). There was fairly equal representation from Asian countries with high gout prevalence (Taiwan) as well as those with low prevalence (China, South Korea, Philippines, Vietnam), [19]. Only 22% of patients were Hispanic or Caucasian (22%). Patients tended to have longstanding gout (mean duration 9.5 years) and hyperuricemia (83%). The lower extremities were most often affected (91%), followed by the upper extremities (74%) and trunk (39%). The most common comorbidities were chronic kidney disease (61%) and hypertension (61%). Notably, in several cases, the skin involvement prompted the initial diagnosis of gout.

If possible, biopsies of suspected gout should be fixed in absolute alcohol to permit visualization of negatively birefringent MSU crystals under polarized light [3]. Formalin fixation and hematoxylin-eosin staining lead to crystal dissolution, but the diagnosis can still be made based on dermal and/or subcutaneous deposits of pink amorphous material with a surrounding infiltrate of lymphocytes, histiocytes, and multinucleated giant cells.

Uric acid-lowering therapy with allopurinol has been reported to decrease the size and number of tophi in around one-third of patients with disseminated cutaneous gout. However, it is important to inform patients that improvement may occur gradually over years [4, 16, 18]. Surgical excision could be considered for tophi causing nerve compression or limiting mobility. All patients should be counseled on lifestyle modifications including weight loss and dietary trigger avoidance.

Conclusion

The manifestation of intra-articular tophi in advanced gout is general medical knowledge. However, disseminated cutaneous gout is a rare

Table 1. *Characteristics of reported patients with disseminated cutaneous gout, including present case (N=23), [2-18]*

Characteristic	Value
Age, mean (SD), years	49.1 (10.3)
Sex	
Male	20 (87.0)
Female	3 (13.0)
Race/Ethnicity	
Asian	13 (56.5)
Hispanic	3 (13.0)
Caucasian	2 (8.7)
Not reported	5 (21.7)
Gout duration, mean (SD), years	9.5 (6.0)
Hyperuricemia	19 (82.6)
Affected body site	
Lower extremities	21 (91.3)
Upper extremities	17 (73.9)
Trunk	9 (39.1)
Comorbidity	
Chronic kidney disease	14 (60.9)
Hypertension	14 (60.9)
Alcohol use	9 (39.1)
Diabetes mellitus	8 (34.8)
Obesity	7 (30.4)
Psoriasis	4 (17.4)
Allopurinol treatment	16 (69.6)
Complete resolution	1 (6.3)
Partial resolution	5 (31.3)
No response	1 (6.3)
Outcome not available	9 (56.3)

atypical variant that should be included in the differential diagnosis of firm papules and nodules outside the joints, even in the absence of a known history of gout. Disseminated cutaneous gout is most commonly reported in males, Asians, and those with longstanding gout, and strongly favors the lower extremities. If there is suspicion for gout, biopsies should be fixed in absolute alcohol to permit visualization of monosodium urate crystals under polarized light. Allopurinol may lead to improvement in a minority of cases. Further studies are needed to elucidate the pathophysiology, predisposing factors, and optimal therapy of disseminated cutaneous gout.

Potential conflicts of interest

The authors declare no conflicts of interests

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