

Cutaneous Dissemination of Tophi Indicating Poorly Managed Gout: A Case Report

Rakotonirainy Oliva Henintsoa^{1*}, Solofoniaina Marinah Hasintsoa², Radinasoa Rajo Paidia², Rakotonirina Lalao Nomenjanahary¹ and Rapelanoro Rabenja Fahafahantsoa¹

¹Department of Rheumatology and Dermatology, Joseph Raseta Befelatanana University Hospital, Antananarivo, Madagascar

²Department of Internal Medicine, Joseph Raseta Befelatanana University Hospital, Antananarivo, Madagascar

Citation: Henintsoa RO, Hasintsoa SM, Paidia RR, Nomenjanahary RL, Fahafahantsoa RR. Cutaneous Dissemination of Tophi Indicating Poorly Managed Gout: A Case Report. *Medi Clin Case Rep J* 2026;4(1):1606-1609. DOI: doi.org/10.51219/MCCRJ/Rakotonirainy-Oliva-Henintsoa/443

Received: 12 February, 2026; **Accepted:** 15 February, 2026; **Published:** 17 February, 2026

***Corresponding author:** Rakotonirainy Oliva Henintsoa, Department of Rheumatology and Dermatology, Joseph Raseta Befelatanana University Hospital, Antananarivo, Madagascar, Tel: +261340210389

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ABSTRACT

Gout is a systemic metabolic disease caused by chronic hyperuricemia. Poor adherence to urate-lowering therapy is a major contributor to chronic gout. Disseminated cutaneous tophi are rare manifestations of tophaceous gout. We report the case of a 72-year-old man with chronic gout, presenting with multiple disseminated tophi, destructive polyarthritis and renal failure.

A 72-year-old man was hospitalized due to severe disabling pain in both ankles and heels, leading to an inability to walk. His BMI was 30 kg/m². Joint examination revealed ankle arthritis and mild flexion contractures affecting the hands, elbows and knees. Cutaneous manifestations included surgical scars on the fingers; large, firm, painless subcutaneous swellings on the second left finger, left elbow and along the postero-external aspect of the left forearm; diffuse infiltrated yellowish nodules, some ulcerated, on the legs, the left auricle and the third left finger. Biological tests showed metabolic syndrome with uncontrolled diabetes, mixed dyslipidemia and an elevated serum uric acid level of 530 µmol/L. He also presented with severe renal insufficiency and an elevated CRP level of 100 mg/L. Cutaneous biopsies from different sites revealed monosodium urate crystals, confirming the diagnosis of diffuse cutaneous tophi. Conventional radiographs of the hands and feet showed signs of gouty arthropathy. The patient was treated with colchicine (0.5 mg/day), prednisolone (30 mg/day for 3 days), atorvastatin, ramipril and insulin glargine (8 IU in the evening), resulting in favorable clinical improvement.

Keywords: Chronic gout; Tophi; Medication adherence; Renal insufficiency

Introduction

Gout is an ancient systemic metabolic disease caused by chronic hyperuricemia, leading to the deposition of monosodium urate crystals in joints and soft tissues¹. Despite the proven efficacy of urate-lowering medications in preventing chronic gout, patient adherence to treatment remains low². Recent literature describes more severe and atypical manifestations of the disease. The classic monoarticular involvement is becoming increasingly rare, with atypical polyarticular presentations now more common³. Similarly, tophi, traditionally found periarticularly or in avascular soft tissues such as the auricle of the toes⁴, have been reported in other organs⁵. Cutaneous dissemination of tophi has been described as a rare dermatological manifestation of chronic gout⁶⁻⁹. We present the case of a 72-year-old Malagasy patient with chronic gout, characterized by disseminated cutaneous tophi, destructive polyarthritis and renal insufficiency.

Case Presentation

A 72-year-old man was hospitalized in the Rheumatology department due to severe disabling pain in both ankles and heels. His medical history was unremarkable, with no hypertension, diabetes or alcohol use. He reported recurrent episodes of debilitating joint pain over the past 42 years; each

treated with injectable diclofenac. He had undergone multiple surgical excisions of masses, diagnosed as gouty tophi, on his hands. However, he had never received urate-lowering therapy. The current episode began 10 days before admission with the sudden onset of severe pain in both ankles and heels, accompanied by nocturnal pain that resulted in an inability to walk. The appearance of spontaneous wounds on his heels and the failure of pain relief with injectable diclofenac prompted his hospitalization.

On Admission The patient complained of persistent intense pain in both ankles and heels. His blood pressure was 110/90 mmHg, heart rate was 84 bpm, temperature was 37.9°C and BMI was 30 kg/m². Joint examination revealed fluctuating swelling in both ankles, along with mild, painless flexion contractures affecting the hands, elbows and knees. Cutaneous findings included surgical scars on the extensor surfaces of the fingers; large, firm, painless subcutaneous masses on the extensor surface of the metacarpophalangeal joint of the second left finger and the left elbow, extending along the postero-external aspect of the left forearm; diffusely infiltrated subcutaneous yellowish nodules, some ulcerated, located on the legs, the left auricle and the extensor surface of the third left finger (**Figure 1**). The remainder of the clinical examination was unremarkable.



Figure 1: **Left:** Surgical scar from tophus excision on the right hand. **Center:** Top: Large subcutaneous tophus over the olecranon, **Bottom:** Large tophus over the extensor surface of the distal interphalangeal and metacarpophalangeal joints. **Right:** Disseminated subcutaneous tophi on the leg and tophus on the auricle of the left ear.

Biological and Imaging Findings Laboratory tests revealed an elevated CRP level of 100 mg/L, normocytic anaemia with haemoglobin at 87 g/L and renal insufficiency with a serum creatinine level of 185 μ mol/L, corresponding to an estimated glomerular filtration rate (eGFR) of 35.77 mL/min/1.73m². Blood urea was 8.43 mmol/L and the electrolyte panel was within normal limits. Fasting blood glucose was 20.74 mmol/L, with a glycosylated haemoglobin level of 11.3%, indicating poorly controlled diabetes. Serum uric acid was elevated at 530 μ mol/L. The lipid profile was abnormal, with a total cholesterol level of 5.24 mmol/L, HDL cholesterol at 0.92 mmol/L, LDL cholesterol at 2.95 mmol/L and triglycerides at 3.01 mmol/L. Cutaneous biopsies from different sites revealed monosodium urate crystals (**Figures 2 and 3**), confirming the diagnosis of diffuse cutaneous tophi. Conventional radiographs of the hands and feet showed signs of gouty arthropathy with multiple periarticular geodes. Renal and urinary tract ultrasound imaging demonstrated a dedifferentiated renal parenchymal pattern without evidence of lithiasis.

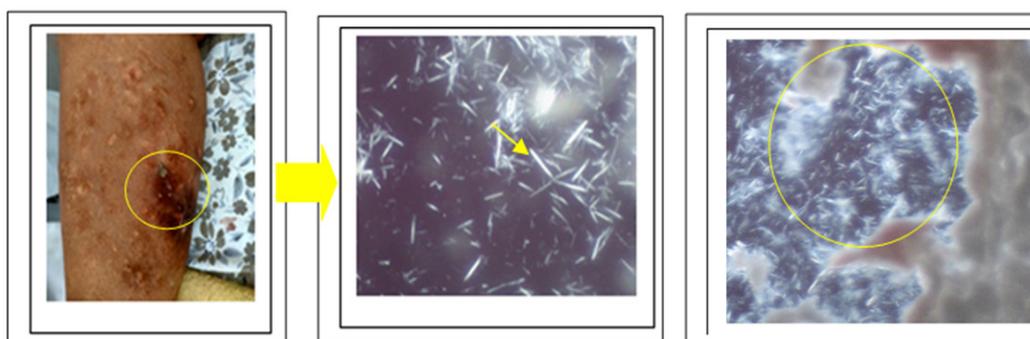


Figure 2: **Left:** Left leg-disseminated tophi sampled for microscopic examination. **Center:** Monosodium urate crystals in a needle-shaped formation observed under polarized light microscopy at 4 \times magnification. **Right:** Monosodium urate crystals in a needle-shaped formation observed under polarized light microscopy at 10 \times magnification

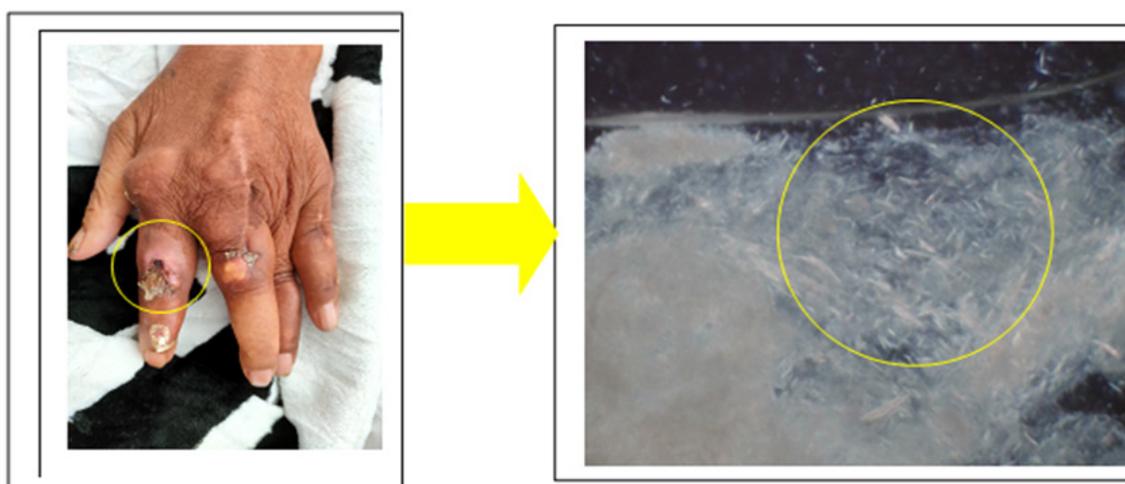


Figure 3: Left: Ulcerated tophus on the second left finger. Right: Needle-shaped monosodium urate crystals observed in the biopsy sample from the ulcerated tophus on the second left finger under polarized light microscopy at 4× magnification

Conclusion and Management The patient presented with an acute gout flare superimposed on chronic gout (disseminated cutaneous tophi, gouty arthropathy), along with newly diagnosed uncontrolled diabetes, mixed dyslipidaemia and possible chronic renal insufficiency. During hospitalization, he was treated with colchicine (0.5 mg/day), prednisolone (30 mg/day for 3 days), atorvastatin (20 mg/day), ramipril (10 mg/day) and insulin glargine (LANTUS®) (8 IU in the evening). His condition improved, with resolution of the acute flare and stabilization of fasting blood glucose levels. Upon discharge, the patient continued with the same therapeutic regimen, supplemented by physiotherapy. He is scheduled for follow-up to initiate febuxostat therapy. Additionally, he was referred to endocrinology for diabetes management and nephrology for further evaluation of his renal insufficiency.

Discussion

This case report highlights the coexistence of both classic manifestations of gout and the rare presentation of disseminated cutaneous tophi. The patient's clinical profile is characteristic of gout, with metabolic syndrome, a sedentary lifestyle, recurrent arthritis, tophi, renal insufficiency and hyperuricemia¹⁰. Additionally, it illustrates the challenge of ensuring patient adherence to treatment, as evidenced by the absence of urate-lowering therapy despite the long-standing disease history. Disseminated cutaneous involvement of tophi is an uncommon manifestation of chronic gout^{7,9,11}. Given the diverse characteristics of the lesions, differential diagnoses include subcutaneous calcinosis, rheumatoid nodules and eruptive xanthomas^{12,13}. Cutaneous biopsies are essential to confirm the diagnosis, as they reveal monosodium urate crystals^{7,9,11,14}. The identification of monosodium urate crystals remains the gold standard for diagnosing gout¹⁵. In our case, this step was made possible by the recent availability of a polarized microscope in our department, allowing for the detection of monosodium urate crystals in various lesion sites. Risk factors for disseminated cutaneous tophi include obesity, chronic venous insufficiency and long-term corticosteroid therapy⁶.

Conclusions

This case report highlights the polymorphic presentation of gout. The identification of monosodium urate crystals is crucial

for confirming the diagnosis. Patient adherence to treatment remains a significant challenge.

Author Contributions

1. Oliva Henintsoa Rakotonirainy: contributed to the conceptualization, formal analysis, and writing of the original draft, as well as its revision and editing.
2. Marinah Hasintsoa Solofoniaina: contributed to the writing of the original draft, as well as its revision and editing.
3. Rajo Paidia Radinasoa: supervised and validated the work.
4. Rakotonirina Lalao Nomenjanahary: supervised and validated the work.
5. Fahafahantsoa Rapelanoro Rabenja: provided resources and supervision.

Ethical Approval

The authors thank the patient who provided written consent for this report. The authors have included only the information necessary for scientific understanding.

Consent

Patient has provided written consent for the publication of this report in accordance with the journal consent policy.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare no conflicts of interest.

Funding

No funding was received for this study.

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