

# Chronic Tophaceous Gout Presenting as Bilateral Knee Masses in an Adult Patient: A Case Report

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## Learning Point of the Article:

Chronic tophaceous gout presenting with ulcerating skin breakdown overlying a fungating tophaceous mass is uncommon and surgical intervention is traditionally reserved for atypical cases that present with deformities, severe pain, and joint destruction.

## Abstract

**Introduction:** Gout is a common disorder of uric acid metabolism that leads to the precipitation of monosodium urate crystals. It most commonly affects the first metatarsophalangeal joint but can also affect other joints such as knees, elbows, wrists, and ankles. Chronic gout can present as recurrent episodes of monoarticular or polyarticular inflammatory arthritis, tophaceous soft tissue deposits of monosodium urate crystals, uric acid renal calculi, and/or chronic nephropathy.

**Case Report:** We report the case of a 67-year-old Caucasian male patient with bilateral tophaceous gout to his knees involving the soft tissue and ulcerating skin breakdown to his left knee after an acute traumatic injury. Plain radiographs of the bilateral knees revealed large soft tissue masses anterior to the patella. Magnetic resonance imaging of the left knee was also performed which demonstrated heterogeneous masses consistent with tophi and peripheral enhancement with central necrosis. A diagnostic biopsy was performed to rule out malignancy the results confirmed gouty tophi. We report this case to note the atypical presentation of this disease.

**Conclusion:** Chronic tophaceous gout presenting with ulcerating skin breakdown overlying a fungating tophaceous mass is uncommon considering the current availability of effective pharmaceutical treatments for hyperuricemia. Surgical intervention for tophaceous gout is seldom required and is traditionally reserved for atypical cases that present with deformities, severe pain, and joint destruction. Although ulcerative tophi are rare, they can have significant morbidity and greatly impact patients' quality of life. Surgical intervention was indicated in our patient to excise the mass and avoid infective complications.

**Keywords:** Gouty tophi, inflammatory arthritis, tophaceous gout.

## Introduction

Gout is a disorder of uric acid metabolism that is characterized by an acute or chronic deposition of monosodium uric acid crystals in joints, bones, soft tissues, and kidneys. Patients typically present with monoarticular arthritis most commonly affecting the first metatarsophalangeal joint of the foot. Chronic gout can present as recurrent episodes of monoarticular or polyarticular inflammatory arthritis, tophaceous soft tissue deposits of monosodium urate crystals, uric acid renal calculi, and/or chronic nephropathy. The most common locations of

large aggregates of tophi include fingers, the first metatarsophalangeal joints, knees, olecranon bursa, Achilles tendons, and helices of the ear [1]. These patients may experience chronic pain and often have polyarticular involvement. Tophi typically deposit within or around joints but can also develop subcutaneously [2]. Due to the availability of urate-lowering drugs, tophaceous gout presenting as soft tissue masses is uncommon. When present around the knee, it has been known to occur in the patellar and quadriceps tendons and mimic a neoplastic lesion. While tophi can become large

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## Author's Photo Gallery

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**Figure 1:** The left lower extremity (a) and the right lower extremity (b) preoperatively demonstrating gouty tophi with overlying ulceration to the left lower extremity.



**Figure 2:** Plain radiograph of the left lateral knee preoperatively demonstrating a soft tissue mass with calcium precipitation overlying the extensor mechanism.



**Figure 3:** Radiographic image of the right lower knee preoperatively demonstrating a soft tissue mass with calcium precipitation overlying the extensor mechanism.

and result in joint deformities, ulceration of the skin by tophi is uncommon and difficult to treat. We report the case of a 67-year-old Caucasian male suffering from chronic tophaceous multiarticular gout with soft tissue involvement, presenting with skin breakdown overlying his left anterior knee. We report this case to note the atypical presentation of this disease. The patient provided informed written consent for print and electronic publication of this case report.

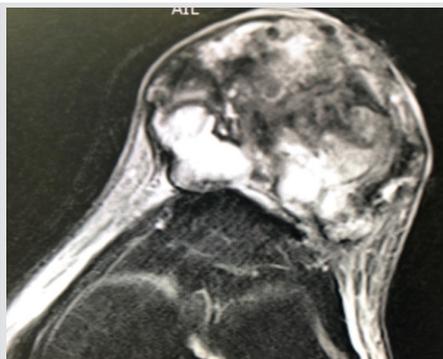
**Case Report**

A 67-year-old Caucasian male with a 10-year history of tophaceous gout in his knees bilaterally, treated with allopurinol, was admitted with a 3-week history of swelling, pain, and drainage from his left knee. His symptoms began after an acute traumatic injury to the left lateral knee, in which he suffered a small cut with a break in the skin. Before the injury, the patient was asymptomatic and denied any pain, bleeding, or skin breakdown to the bilateral knees. On physical examination, the patient had a large, tennis ball-sized mass over his left knee anterior to the patella and patellar tendon, with a second irregularly shaped firm mass inferior to this (Fig. 1a). There were multiple areas of skin breakdown over the large mass overlying the patient’s left knee, which was draining purulent and sanguineous fluid that appeared to be gouty tophaceous material. There was no surrounding erythema. Over the right anterior knee, there were two large, firm masses (Fig. 1b). The

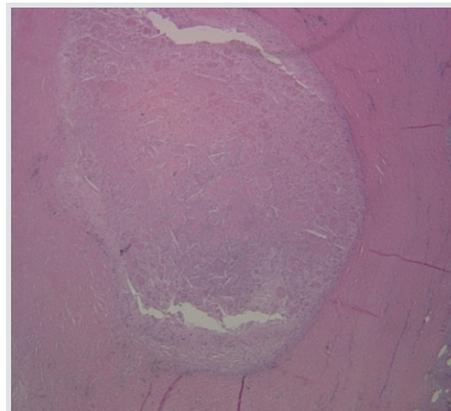
superior mass was tennis ball sized and the inferior mass was smaller and irregularly shaped. There was thinning of the overlying skin, which remained intact. He denied any pain to the right knee. The patient’s examination was also remarkable for a 3×3 cm, firm, mobile, non-tender, soft tissue mass over the proximal right olecranon. He denied any pain or limited range of motion or function secondary to this mass. His medical history consisted of gout, diabetes mellitus, and hypercholesterolemia. The patient reported a distant history of a similar mass being resected from his right knee. His surgical history also included removal of the left knee bursa and carpal tunnel release. He denied any smoking or illicit drug use but endorsed social alcohol use. He had an average build with a body mass index of 26.9. The patient was started on intravenous antibiotics and imaging studies were performed.

Plain radiographs of the bilateral knees revealed large soft tissue masses anterior to the patella (Fig. 2 and 3). Magnetic resonance imaging of the left knee was also performed which demonstrated heterogeneous masses consistent with tophi and peripheral enhancement with central necrosis (Fig. 4). A diagnostic biopsy was performed to rule out malignancy and to confirm tophaceous gouty masses (Fig. 5). The results of the biopsy confirmed gouty tophi.

Surgical intervention was indicated for excision of the mass overlying the patient’s left knee due to its extraordinary size and ulcerating presentation. This was coordinated with plastic



**Figure 4:** Axial T2-weighted magnetic resonance imaging of the left knee preoperatively revealing an enhancing and heterogeneous soft tissue mass overlying the extensor mechanism.

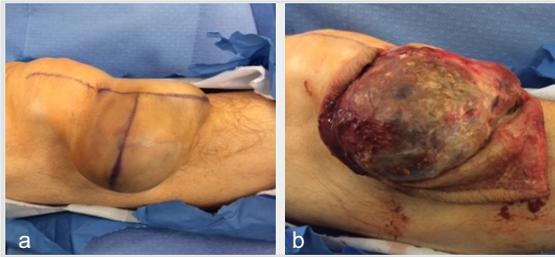


**Figure 5:** Histological evidence of biopsy showing gouty tophus.



**Figure 6:** The left knee postoperatively demonstrating wound closure with a Jackson-Pratt drain.





**Figure 7:** The right knee gouty tophi preoperatively (a) and during perioperative exposure (b).



**Figure 8:** Post-operative images of the right (a) and left (b) knee.

about the knee, it has been known to occur in the patellar and quadriceps tendons and mimic a neoplastic lesion [6].

Poorly controlled gout may progress to chronic complications such as polyarticular attacks, painful symptoms between acute flares, and tophi deposition in soft tissues and joints [4]. Tophi can also be associated with ulcerations, bone

fractures, tendon and ligament ruptures, carpal tunnel syndrome, and other nerve compression syndromes [3]. Inadequately treated tophi can enlarge to a size which can cause mechanical pressure on overlying skin and lead to sinus formation with drainage of fluid containing sodium urate crystals. The swollen and erythematous soft tissue can also be mistaken for, and must be differentiated from, cellulitis or septic arthritis [1].

While surgical intervention is seldom required for tophaceous gout, it may be indicated in cases involving recurrent gouty attacks, chronically draining tophi, severe intractable pain, loss of motion, and joint destruction and deformities [7]. The primary indication for surgical intervention is an infection of ulcerating tophi or sepsis [8] but can also be considered in mechanical impairments, uncontrollable pain, and cosmesis [2]. Treatment options include simple enucleation of the tophi. However, this may lead to complications such as skin necrosis and tendon and joint exposures [7]. Classic curettage and debridement may also be implemented to remove tophi; however, this technique has high rates of delayed wound healing and skin necrosis [9]. In addition, skin grafting can be performed for wound closure [10].

urgery for complex wound closure. A midline incision was used to approach the mass. Due to skin defects, a transverse incision was also made which allowed for the rotation of the skin and proper wound closure. The inferior mass was more encapsulated and was circumferentially resected in its entirety after careful elevation of the patellar tendon. Overlying necrotic tissue was removed and plastic surgery performed an adjacent soft tissue transfer for wound closure over a Jackson-Pratt drain (Fig. 6). No skin graft was necessary. The mass was found to be extra-articular and directly anterior to the extensor mechanism. The patient's wound healed uneventfully and he returned to normal function. Two months following excision of the left knee gouty mass, the patient returned and underwent planned resection of the gouty tophaceous mass over the anterior aspect of the right knee using a similar technique (Fig. 7). Of note, the patient denied any antecedent pain or trauma to this knee. At the 1-year follow-up, the patient demonstrated full, painless, active range of motion in his bilateral knees. The surgical incisions appeared well healed and the patient had resumed his normal activities of daily living (Fig. 8).

### Discussion

Gout is a type of inflammatory arthritis associated with hyperuricemia, defined as a serum urate level greater than the saturation point of urate crystal formation at 6.8 mg/dl. This can often result from impaired renal uric acid excretion but is unlikely to be sufficient enough to lead to gout [3]. The prevalence of gout increases with age, male sex, postmenopausal state, and African American race, which are key risk factors for the development of the disease [4]. Other conditions that can be associated with gout include insulin resistance, obesity, hypertension, congestive heart failure, and organ transplantation [4]. Recurrent flares can be triggered by recent diuretic use, alcohol intake, hospitalization, and surgery. Urate-lowering therapies can also trigger acute gouty attacks in the early initiation period as a result of the mobilization of uric acid stores [5]. Patients typically present with acute monoarticular arthritis most commonly affecting the first metatarsophalangeal joint of the foot. Due to the availability of urate lower drugs, tophaceous gout presenting as soft tissue masses, as seen in our patient, is uncommon. When present

### Conclusion

Surgical intervention for gouty tophi is uncommon and typically reserved for cases presenting with deformities, severe pain, and joint destruction. Our patient presented to us with relatively unusual findings of gouty masses overlying both knees, despite previous pharmaceutical treatment, and ulcerating skin breakdown overlying the left knee mass following an acute traumatic injury. Although ulcerative tophi are rare, they can have significant morbidity and greatly impact patients' quality of life. Surgical intervention was indicated in our patient to excise the mass and avoid infective complications. While our patient was able to maintain the full functional status of his knee joints postoperatively, further research should be aimed toward identifying the best medical, surgical, and wound care regimen for the treatment of ulcerated tophaceous masses.

### Clinical Message

Chronic tophaceous gout presenting with ulcerating skin breakdown overlying a fungating tophaceous mass is uncommon considering the current availability of effective pharmaceutical treatments for hyperuricemia. Surgical intervention for tophaceous gout is seldom required and is traditionally reserved for atypical cases that present with deformities, severe pain, and joint destruction. Although ulcerative tophi are rare, they can have significant morbidity and greatly impact patients' quality of life.

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**Consent:** The authors confirm that Informed consent of the patient is taken for publication of this case report

### How to Cite this Article

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