

Clinically Impressive Tophaceous Gout With Significant Bony Destruction

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To prevent complications of gout, health care providers should educate patients about its risks, institute regular checkups, and start medications early to control uric acid levels.

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Gout is an inflammatory condition that is generally characterized by red, hot, swollen, and painful joints. The disease is often associated with increased serum uric acid levels; which are considered elevated when they are > 6 mg/dL in women and > 7 mg/dL in men. When gout affects joints, the subchondral bone may be involved, leading to destructive, painful changes. This article presents the case of a patient diagnosed with tophaceous gout of the left second toe with bony erosive changes and calcified nodules noted on magnetic resonance images (MRI).

CASE PRESENTATION

A 70-year-old white male presented to the podiatry clinic for a left second-toe mass that was diagnosed as tophaceous gout after being seen by his primary care physician. The patient reported that the mass had slowly grown over the past 10 years. At presentation, he had a 0.2-cm ulcer on the dorsal aspect of the left second-toe mass. The patient stated that the ulcer had recently appeared with some exudate; however, there was no active drainage of material. The patient had a 20-year history of gout that was untreated with dietary modifications or medication. The patient also stated that although the left second-toe mass did not cause any pain on rest, it did cause pain with shoe gear and during ambulation. A community-based podiatrist had recommended amputation of the second toe and as a result the patient was seeking a second opinion at the US Department of Veterans Affairs (VA) Lebanon VA Medical Center (VAMC) in Pennsylvania. The patient had not had acute gouty attacks during the past 10 years.

The patient's medical history was signifi-

cant for uncontrolled gout, hyperlipidemia, coronary artery disease with a 4-vessel coronary artery bypass grafting, impaired fasting glucose, prostate cancer that was in remission, alcohol misuse (currently limited to ≤ 2 drinks per night), and 30-year history of cigarette smoking (quit 2 months prior to visit).^{1,2}

At his first visit to the clinic, an examination revealed distinct evidence of bulging of the soft tissues of the second toe of the left foot with a dry sinus tract that was not malodorous (Figure 1). The left second toe was erythematous and edematous. A local increase in skin temperature was present on the second toe of the left foot compared with that of the contralateral foot and other toes. The dorsalis pedis and tibialis posterior pulses were easily palpated, and the capillary return was within normal limits. Palpation of the left second-toe plantar elicited mild tenderness. Crepitation was not present at the left second metatarsophalangeal joint (MPJ) nor at the interphalangeal joint. There was restricted range of motion at the left second MPJ compared with that of the right foot and no motion at the proximal interphalangeal joint. The movement at the left second metatarsophalangeal elicited tenderness. The mass on the left second toe was firm, nonpulsatile, oval-shaped, with a white pigmented consistency that measured 2 cm x 2.5 cm.

There were no deficits present on the neurologic examination, which was noncontributory. There also was no gross evidence of motor weakness. His initial temporal temperature was 98.2° F. The initial laboratory findings were uric acid, 9.5 mg/dL; fasting glucose, 117 g/dL; estimated glomerular

filtration rate, 55 mL/min/1.73 m²; erythrocyte sedimentation rate, 6.5 mm/h; and white blood count, 6.6 K/uL.^{3,4,6}

Diagnostic imaging included X-rays of the patient's feet and a MRI of the left foot. The X-rays showed diffusely osteopenic bones with severe soft tissue swelling surrounding the second proximal interphalangeal joint. Also present was moderate soft tissue swelling at the level of the first metatarsophalangeal joint accompanied by extensive erosions at both of these joints, most pronounced at the second proximal interphalangeal joint. Also, there was narrowing at the first MPJ and the first interphalangeal joint. Erosive changes at the tarsometatarsal articulations and small lucencies within the navicular/midfoot joint were suggestive of additional gouty erosions. A small-to-moderate posterior calcaneal enthesophyte was present as well as a tiny calcaneal enthesophyte (Figure 2).

A MRI showed a destructive soft tissue mass, resulting in overhanging edges, with foci of calcifications centered about the proximal interphalangeal joint of the second toe, which is consistent with a calcified tophaceous gout nodule. The widest dimension of the mass measured 3.2 cm. There also was a less prominent calcified tophaceous gout nodule at the first MPJ. There were additional small punched-out lesions involving the bases of the first through fourth metatarsi and at the distal aspect of the first cuneiform in keeping with gouty arthropathy (Figure 3).^{4,7-10}

The initial treatment plan presented to the patient was to amputate the left second toe. But the patient decided against amputation. Treatment guidelines for allopurinol are to titrate in 100-mg increments every 2 weeks until the serum uric acid levels are consistently < 6, tophi resolve, and the patient should be free of gout attacks.¹¹ We initiated uric acid-lowering therapy with allopurinol at 50 mg/d for 7 days, increasing to 100 mg/d for 7 days, then to 200 mg/d for 10 days. The patient's serum uric acid level was checked at 200 mg/d.

Our patient could not tolerate the allopurinol and decided to discontinue treatment. After 1 year he started having severe pain and returned to have the toe amputated. The patient healed uneventfully.

FIGURE 1 Photograph Showing Swelling and Erythema Dorsally With Associated Mass

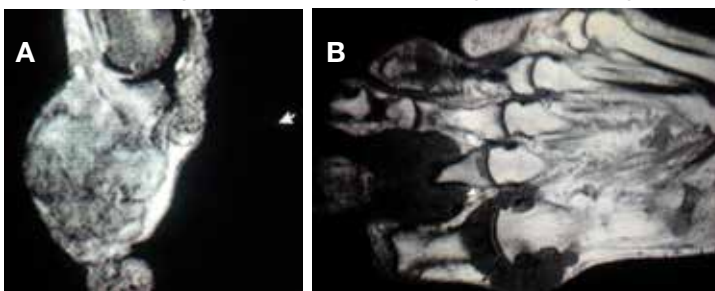


FIGURE 2 X-rays Showing Severe Soft Tissue Swelling



Swelling surrounds the second proximal interphalangeal joint along with severe bony destruction of left proximal phalanx and proximal interphalangeal joint. (A) medial oblique view; (B) anteroposterior view.

FIGURE 3 Magnetic Resonance Images Showing Mass



Calcified tophaceous nodules can be seen at the first metatarsophalangeal joint and swelling and dorsal erythema with associated mass on second toe of left foot. (A) frontal view; (B) sagittal dorsal view.

DISCUSSION

Tophaceous gout is characterized by collections of solid urate accompanied by chronic inflammatory and often destructive changes in the surrounding tissue brought on by periods of increased uric acid levels. Due to the

patient's 20-year history of untreated tophaceous gout, we saw the extent of bony and soft tissue destruction that this pathology created. This patient's uric acid laboratory value of 9.5 mg/dL was well above the normal reference values of 2.6 to 7.2 mg/dL. The X-rays performed suggested that there was not only bony destruction, but also deformity.

The destruction to the surrounding soft tissues noted as advanced nonhealing wounds formed to the area of the tophi. The size of the second digit also was impressive, causing displacement of the other digits. As stated in the literature, tophaceous gout is usually painless as was the case in our patient. It is the combination of the relatively painless nature of this pathology accompanied by no treatment over many years that led to the patient's level of deformity and tissue destruction.

CONCLUSION

We describe a common presentation of bone involvement secondary to significant tophaceous gout in the absence osteomyelitis. The goal of treatment was to maintain a functional foot free of major deformity, pain, or associated risk factors that could lead to a more significant surgical procedure, such as a proximal amputation.¹¹ Given the destructive nature of this pathology, it is important to educate the patient, perform regular examinations, and start medications early to control uric acid levels. These measures will improve the patient's prognosis and avoid severe sequelae.

Author disclosures

The authors report no actual or potential conflicts of interest with regard to this article.

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