Giant Gouty Tophi of the Hand and Wrist

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Abstract

Gout is an inflammatory-rheumatic disease characterized by an elevated serum urate concentration and recurrent flares, including painful, hot, red, and swollen joints and surrounding tissue. Untreated gout often develops into a chronic disease with tophi and destruction of joint surfaces. Giant tophi are often resistant to medication and change in diet.

This article presents a case of a 44-year-old man with giant gouty tophi at his hand and wrist. The last acute gout flare in his left wrist was approximately 3 years prior. For 2 years he had refused adequate nutrition, such as a low-purine diet, and had refused to take any preventive medication. Blood urate level was elevated to 8.7 mg/dL (normal range, 3.4–7.0 mg/dL). In time, the tophi led to a massive limitation of motion and use of especially the left wrist and thumb. Under the condition that the patient changed his diet and took the medication for his underlying disease, we surgically removed the almost skin-perforating tophi. Surgical debulking significantly improved joint function and cosmetic appearance.

The best treatment for gouty tophi is prevention by ensuring adequate nutrition, treating the underlying causes, and taking effective medication. In the case of massive limitation of joint motion, skin breakdown with risk of infection, and compression of neurovascular structures, surgical debulking of the tophi should be considered.

Figure: Preoperative photograph of giant tophi of the dorsal left wrist and thumb. Note the almost perforated skin of the thumb.
Gout is an inflammatory-rheumatic disease characterized by an elevated serum urate concentration and recurrent flares, including painful, hot, red, and swollen joints and surrounding tissue. Untreated gout often develops into a chronic disease with tophi and destruction of joint surfaces. Giant tophi are often resistant to medication and change in diet. This article presents a case of a patient with giant gouty tophi at his hand and wrist.

**CASE REPORT**

A 44-year-old man presented to our outpatient clinic with a 10-year history of gout and an otherwise unremarkable medical history. The last acute gout flare in his left wrist was approximately 3 years prior. For 2 years he had refused adequate nutrition, such as a low-purine diet, and had refused to take any preventive medication. The patient consumed 2 to 3 beers per day and occasionally used nonsteroidal anti-inflammatory drugs to relieve the pain. He worked at a computer for 8 hours per day. During the past 2 years, he had experienced a slow-growing, nonpainful tophi at both hands and wrists. In time, these tophi led to a massive limitation of motion and use of especially the left wrist and thumb.

Examination of the patient revealed enormous swelling of the left wrist, thumb, and distal interphalangeal joints along with beginning deformity (Figure 1). The affected joints were slightly sensitive to pressure and, as expected, range of motion was reduced. Further clinical examination was without pathological findings. His blood urate level was elevated to 8.7 mg/dL (normal range, 3.4-7.0 mg/dL). Native radiographs of the left hand and wrist displayed erosive defects of the distal radius and ulna as well as pronounced changes in the carpal bones, metacarpals, and phalanges, with signs of secondary osteoarthritis (Figure 2).

Under the condition that the patient change his diet and take medication for his underlying disease, we surgically removed the giant, almost skin-perforating tophi from his left wrist and thumb 6 weeks after initial presentation. A tourniquet was positioned over the left upper arm and inflated to 250 mm Hg. After skin incision over the dorsal wrist, the typical colored urate crystals appeared and were removed (Figure 3). Where necessary, the extensor tendons were exposed and protected by retractors. For the left thumb, we used a radial approach to conserve the blood supply of the almost perforated skin. Many light brown to yellow tissue samples were taken (Figure 4). So as not to compromise important vascular and nervous structures, only subtotal excision was possible. Intraoperative swabs were negative. Pathologic examination confirmed the diagnosis of gout with negative birefringent crystal structures in the polarization microscopy.

At 6-week follow-up, the patient was back at work and still taking his medication. He was pain free with a significant reduction in volume and highly improved mobility of the operated areas (Figure 5). His blood urate level had decreased to 6.6 mg/dL.
DISCUSSION

Gout is an inflammatory-rheumatic disease characterized by recurrent flares of painful, hot, red, and swollen joints, including the surrounding tissue. It is caused by precipitating uric acid crystals due to prolonged elevated blood levels. The probability of a clinical manifestation of gout increases with rising blood levels of uric acid (normal range, 3.4-7.0 mg/dL). Hyperuricemia is caused by renal underexcretion (90%).1 Other causes are rare genetic disorders, medical disorders (metabolic syndrome, renal failure, hemolytic anemia), and medication use.2,3 Approximately 10% of patients with elevated blood levels of uric acid develop gout at some point in their life.4

Gout typically presents with a sudden onset and is highly painful. The first metatarsophalangeal joint is involved in >50% of cases.5 Clinical criteria include >1 attack of acute arthritis, tophi, and skin redness over joints.6 In addition to the determination of the blood urate level, detection of monosodium urate crystals in needle aspiration of the acute inflamed joints or tophi can lead to diagnosis.8 Radiographs are useful for identifying chronic gout. Radiographic hallmarks are periarticular erosions with overhanging edges. The aim of treatment of an acute gout flare is to attenuate the symptoms of the attack. Nonsteroidal anti-inflammatory drugs are effective within hours and are recommended for 1 to 2 weeks.1 Colchicine is an alternative drug, but because of its side effects, including renal damage, diarrhea, or changes in blood count, it has rarely been used in the past few years.9 For prevention of gout, the reason for elevated blood urate levels must be identified and comorbidities must be treated. In combination with urostatics (eg, allopurinol, febuxostat) or uricosurics (eg, probenecid), which are recommended 1 to 2 weeks after the acute attack has resolved, gout flares and tophi could be minimized or even prevented.10

UNTREATED GOUT OFTEN DEVELOPS INTO A CHRONIC DISEASE WITH TOPHI AND DESTRUCTION OF JOINT SURFACES. WITH AGGRESSIVE TREATMENT, SMALLER TOPHI MAY DISSOLVE WITH MEDICATION OR CHANGE OF DIET, BUT GIANT ONES WILL NOT. THEY ARE COMMONLY PAINLESS BUT OFTEN LIMIT THE USE OF AFFECTED JOINTS. IN OUR CASE, THE TOPHI AT THE PATIENT’S FINGERS AND WRIST PREVENTED HIM FROM PROPERLY TAPPING THE KEYS ON HIS COMPUTER KEYBOARD, AND THERE WAS A RISING RISK OF HIS LOSING HIS JOB. FURTHERMORE, THE TOPHUS AT THE THUMB ALMOST PERFORATED THE SKIN, RISKING INFECTION. IN SUCH CASES, SURGICAL MANAGEMENT SHOULD BE DISCUSSED TO RESTORE AND IMPROVE THE JOINT FUNCTION, REDUCE SYMPTOMATIC DISCOMFORT, AND LOWER THE RISK OF INFECTION WHEN THE OVERLYING SKIN BECOMES ULCERATED.11-13 TO AVOID COMPROMISING NEUROVASCULAR STRUCTURES, TENDONS, AND SKIN, ONE SHOULD NOT ATTEMPT EXCISION OF THE WHOLE TOPHUS.14,15 TOPHI THAT ARE ADHERENT TO THE SKIN OR TENDONS ARE GENTLY CURETTED OR EXCISED SHARPLY.16 A RECURRENT OF A DEBULked TOPHI IN THE SAME AREA IS UNCOMMON.6,12

CONCLUSION

As in our case, surgical treatment of giant tophi of the hand can significantly improve function and cosmetic appearance of the affected joints. However, surgical treatment may lead to suboptimal results, such as swelling, due to remaining tophus tissue still reducing joint function and patient comfort.12 The best treatment of gouty tophi is prevention by ensuring adequate nutrition, treating the underlying causes, and taking effective medication. In special situations such as massive limitation of joint motion, skin breakdown with risk of infection, and compression of neurovascular structures, surgical debulking of the tophus should be considered.11-13

REFERENCES