

# Gouty Flexor Tenosynovitis of the Digits: Report of Three Cases

Frederick G. Weniger, MD, *Pittsburgh, PA*,  
Steven P. Davison, MD, DDS, *Washington, DC*,  
Michael Risin, MD, *Pittsburgh, PA*, A. Neil Salyapongse, MD, *Syracuse, NY*,  
Ernest K. Manders, MD, *Pittsburgh, PA*

Gouty tenosynovitis in the hand is a rare entity. To date the limited cases described have involved predominantly extensor tendons in the fingers and flexor tendons in the palm or wrist. Flexor tendon involvement is less common and has been reported only twice to our knowledge distal to the palm. We report 3 cases of extra-articular gout presenting as tophaceous involvement of flexor tendons in the fingers. All cases were treated surgically. These cases are presented to heighten awareness of this rare entity and to provide a setting for a discussion of management. (*J Hand Surg* 2003;28A:669–672. Copyright © 2003 by the American Society for Surgery of the Hand.)

**Key words:** Gout, tophi, flexor tenosynovitis, uric acid.

Extra-articular manifestations of gout are numerous and can present in the hand as nerve entrapment, dermatitis, tophaceous infiltration of the tendon, joint contractures, skin ulceration, a draining sinus, or tenosynovitis.<sup>1</sup> Such involvement of the hand also can simulate infection.<sup>2</sup> Because of its low incidence, however, gouty tenosynovitis rarely is considered in the differential diagnosis of such presentations. Still awareness of gouty tenosynovitis has been heightened by descriptions of cases that involve the hand and/or wrist,<sup>1,3</sup> especially those leading to carpal tunnel syndrome.<sup>4,5</sup> The literature about gouty tenosynovitis has focused on involvement in these areas.

From the Divisions of Plastic Surgery, University of Pittsburgh School of Medicine, Pittsburgh, PA; Georgetown University School of Medicine, Washington, DC; and the Department of Surgery, the State University of New York, Upstate Medical University, Syracuse, NY.

Received for publication January 23, 2002; accepted in revised form March 12, 2003.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

Reprint requests: Ernest K. Manders, MD, Division of Plastic Surgery, 666 Scaife Hall, 3550 Terrace St, Pittsburgh, PA 15261.

Copyright © 2003 by the American Society for Surgery of the Hand  
0363-5023/03/28A04-0020\$30.00/0  
doi:10.1016/S0363-5023(03)00150-3

We know of only 2 previously described cases of gouty tenosynovitis with more distal flexor tendon involvement of the hand.<sup>1,6</sup> One of these reports described comorbid gouty tenosynovitis masquerading as arthritis in a patient with advanced rheumatoid disease and focused on the diagnosis and management of gouty involvement in this difficult setting.<sup>6</sup>

We present 3 cases of gouty tenosynovitis and gouty flexor tendon involvement in the fingers to heighten awareness of this rare entity and to provide a setting for a discussion of management. Two of the cases were misdiagnosed originally. Review of these cases shows that a high index of suspicion for this rare entity based on an appropriate history can lead to a more expeditious diagnosis and treatment. These cases also show the surgical treatment of this type of extra-articular gout, which is described in the Discussion section.

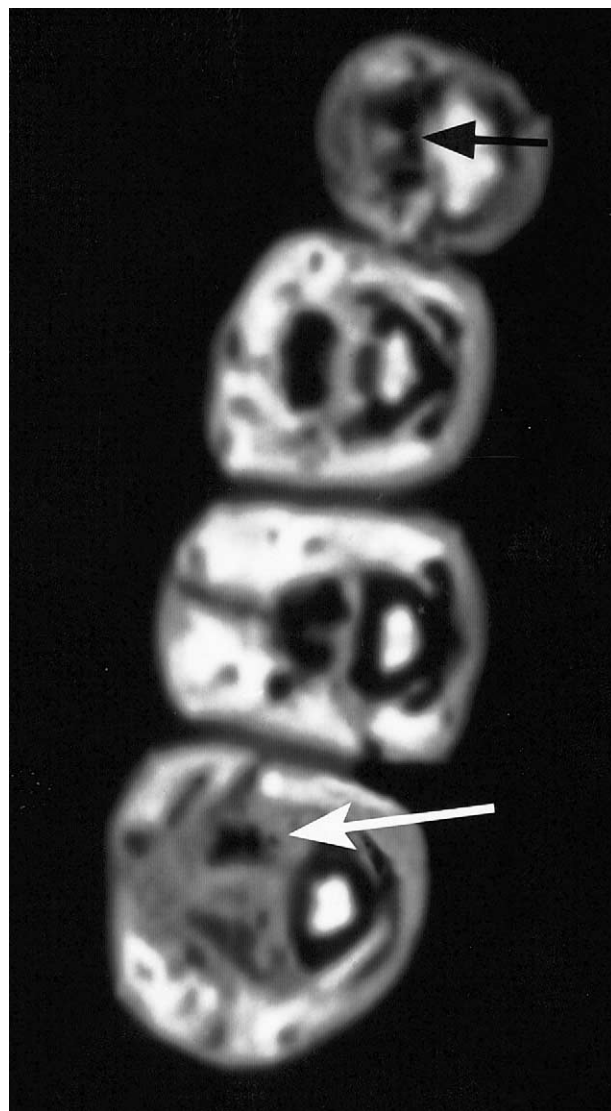
## Case 1

A 54-year-old man presented with 3 painless mobile left-hand masses. He complained of an inability to flex his index finger normally since he recently injured it lifting a heavy object. The patient had a several-year history of gout for which he took indo-

methacin and allopurinol. Physical examination showed a 10-mm, nontender, mobile nodule over the volar aspect of the left small proximal phalynx, as well as 2 smaller, nontender, mobile nodules along the flexor tendons of the small finger in the palm. He had no active flexion at the distal interphalangeal joint but had contractures at the proximal interphalangeal and metacarpophalangeal joints. Preoperative plain radiographs did not suggest abnormality of the distal interphalangeal joint. Surgical exploration during the release of a suspected Dupuytren's contracture showed an exophytic mass overlying a rupture of the flexor digitorum profundus tendon. The mass in the finger was resected and the tendon was repaired. The 2 masses in the palm were not excised. The final pathology report of the excised tendon segment indicated a uric acid tophus. Two months after surgery after splinting and then hand therapy, examination showed a slight deficit from full proximal interphalangeal extension, which improved greatly with more therapy over the following 3 months.

### Case 2

A 74-year-old man with diabetes, chronic renal failure on 80 mg furosemide, and an 8-year history of gout presented with 7 months of difficulty in flexion of the left index finger, which had developed swelling on the volar aspect. He had a remote history of laceration to this area but without any residual deficits. Physical examination showed 10-mm volar masses in the left index finger. Plain x-rays showed no bony abnormalities of the index finger and only stable degenerative changes of the small finger distal interphalangeal joint. A magnetic resonance image showed masses involving the flexor tendons not only of the index finger but also of the left small finger at the level of the proximal interphalangeal joints (Fig. 1). The joint spaces did not appear to be involved radiographically. A uric acid level of 10.0 mg/dL (normal = 2.6–7.2mg/dL) strengthened a preoperative diagnosis of gouty tenosynovitis. Surgical exploration of the 2 digits showed classic tophi with destruction of the flexor sheaths, as well as involvement of the sublimis tendons in both digits (Fig. 2). Debridement of the tophi and tenosynovectomy with the tendons left intact provided immediate ability to flex the fingers. There was no impending rupture of the flexor tendons. The final pathology report was consistent with gouty tophi with uric acid crystals seen. The patient, who was allergic to allopurinol but who

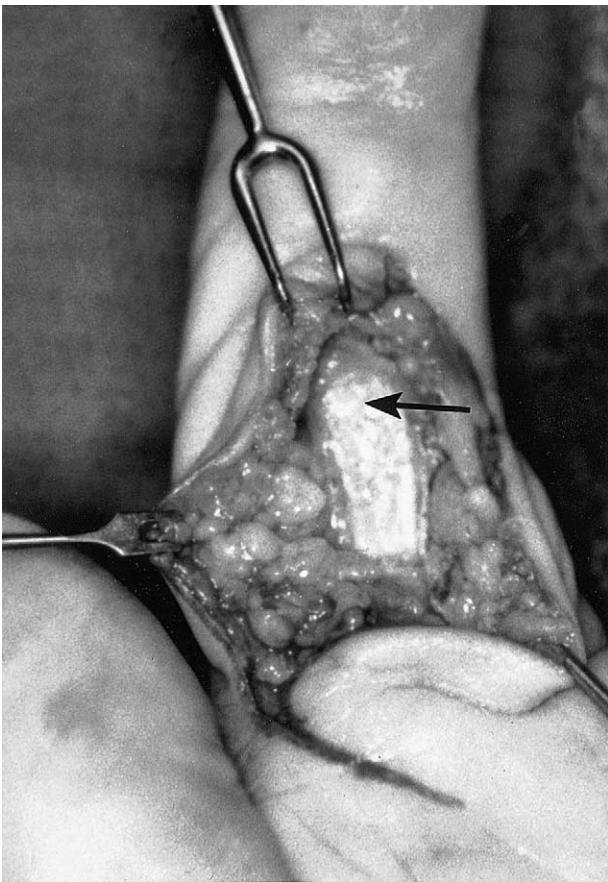


**Figure 1.** A magnetic resonance image at the proximal interphalangeal level in case 2. The white arrow shows flexor tendons (black) in the index finger surrounded by tophus and inflammation (gray). The black arrow shows an inflammatory mass (white/gray) on the volar aspect of the flexor tendons of the small finger.

could take colchicine for acute gouty attacks, was referred for rheumatologic consultation.

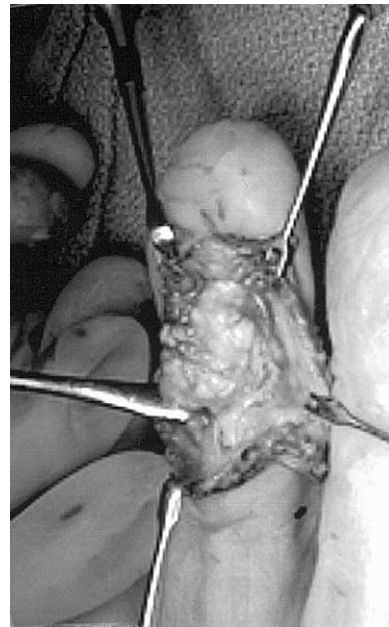
### Case 3

A 72-year-old man with a history of hypertension and gout for 30 years presented with multiple painful nodules on the volar and dorsal aspect of the left middle finger, as well as a large painful mobile lesion on the elbow overlying the olecranon. Marked limitation of both active and passive range of motion of the proximal interphalangeal joint was present. The patient reported that he had multiple tophi excised from his feet and right elbow in the past. His current

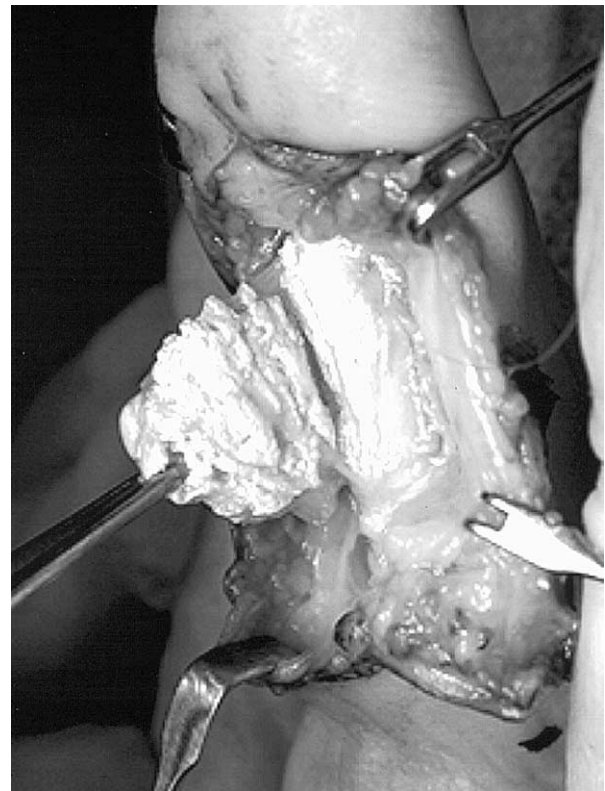


**Figure 2.** Opening the flexor sheath of the index finger in case 2 shows tophaceous infiltration of the flexor digitorum superficialis tendon, shown by the arrow.

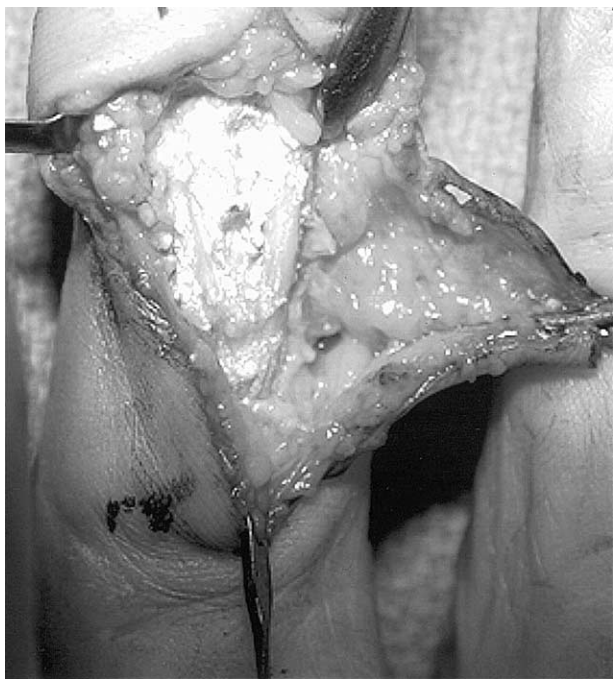
medical regimen consisted of allopurinol and indomethacin. His uric acid level had fluctuated between 9.4 and 7.4 mg/dL (reference range, 2.6–7.2 mg/dL) in the past year. Surgical exploration of the elbow mass showed a tophaceous mass penetrating the insertion of the triceps tendon. The mass was excised partially to avoid weakening of the triceps insertion. Exploration of the middle finger showed extensive gouty tenosynovitis and infiltration of the flexor digitorum profundus tendon distal to the insertion of the flexor digitorum superficialis tendon (Fig. 3). The tophaceous mass was resected partially, including the involved parts of the tenosynovium. Intralesional excision of the tophus from the flexor tendon also was performed (Figs. 4, 5). There was no impending tendon rupture. The final pathology was consistent with gout, with uric acid crystals present. In addition tophi were excised from the dorsum of the finger. After surgery the patient reported resolution of pain and showed notably increased range of motion of the middle finger.



**Figure 3.** Extra-articular gout involving the flexor digitorum profundus and the flexor tenosynovium of the left middle finger in case 3.



**Figure 4.** Excision of tophus involving the tenosynovium in case 3 shows further involvement of the flexor digitorum profundus tendon itself. This required intralesional excision from the tendon.



**Figure 5.** After intralesional excision of tophus from the flexor digitorum profundus in case 3 it can be seen that the lesion had involved the flexor digitorum profundus just distal to the flexor digitorum superficialis insertion.

## Discussion

Gout is characterized by the deposition and collection of sodium urate crystals in articular, peri-articular, renal, tendon, nerve, and synovial sites.<sup>7</sup> This deposition is secondary to serum uric acid production in excess of its elimination. Gouty involvement of the hand, although unusual, is seen with extensive involvement elsewhere in the body. In addition severe involvement of the hand is more likely in patients with a longer history of gout.<sup>7</sup> For these reasons review of the past medical history provides an invaluable tool to raise the index of suspicion for the relatively rare etiology of gout in the differential diagnosis of tenosynovitis. Consideration of gout as a possible culprit is especially important in patients with multiple medical conditions, which could explain the given symptoms.<sup>6</sup>

An elevated serum uric acid level to greater than 7.0 mg/dL<sup>7</sup> in a patient with a flexor tendon nodule and a positive history of gout suggests the presence of gouty tenosynovitis. This was shown in cases 2 and 3. A magnetic resonance image may be useful to show local tophaceous involvement of the tenosynovium (Fig. 1). Finally, a diagnosis of gouty tenosynovitis can be confirmed by the surgical findings of tophi within the tenosynovium (Figs. 2, 4) as well as

by the histologic finding of the classic negative birefringence of sodium urate crystals.

Treatment of gout primarily is medical with non-steroidal anti-inflammatory drugs and colchicine as acute anti-inflammatory agents. Colchicine also is used prophylactically. In addition allopurinol and the uricosurics are used to prevent increased uric acid levels.<sup>2,7,8</sup>

Indications for surgical management of hand involvement include the control of drainage and infection, the reduction of total body urate levels, improved function and appearance, and excision of tophi to decrease pain.<sup>1,2,7</sup> In cases of debilitating gouty flexor tenosynovitis of the fingers such as those described here, surgery is indicated for all of these reasons. In addition surgery provides an opportunity to achieve a firm diagnosis by sending the specimen to be analyzed for uric acid crystals as described previously. Surgical intervention includes exploration, tenosynovectomy, and debridement of tophi<sup>2,7</sup> as was performed in these cases. Advanced tophaceous infiltration also may require tendon resection with either primary repair as seen in case 1 or with subsequent tendon transfer.<sup>1,7</sup>

Early diagnosis based on a high index of suspicion is paramount to the initiation of proper surgical management of gouty flexor tenosynovitis of the fingers. Awareness of this disease entity as well as familiarity with its treatment will lead to more confidence in managing this rare condition.

## References

1. Moore JR, Weiland AJ. Gouty tenosynovitis in the hand. *J Hand Surg* 1985;10A:291-295.
2. Abrahmsson S-O. Gouty tenosynovitis simulating an infection. A case report. *Acta Orthop Scand* 1987;58:282-283.
3. Primm DD Jr, Allen JR. Gouty involvement of a flexor tendon in the hand. *J Hand Surg* 1983;8:863-865.
4. Lianga J, Waslen GD, Penney CJ. Tophaceous gout presenting with bilateral hand contractures and carpal tunnel syndrome. *J Rheumatol* 1986;13:230-231.
5. Janssen T, Rayan GM. Gouty tenosynovitis and compression neuropathy of the median nerve. *Clin Orthop* 1987;216:203-206.
6. Weinzweig J, Fletcher JW, Linburg RM. Flexor tendinitis and median nerve compression caused by gout in a patient with rheumatoid arthritis. *Plast Reconstr Surg* 2000;106:1570-1572.
7. Shapiro PS, Seitz WH Jr. Non-neoplastic tumors of the hand and upper extremity. *Hand Clin* 1995;11:148-152.
8. Wortman RL. Gout and other disorders of purine metabolism. In: Fauci AS, Braunwald E, Isselbacher KJ, Wilson JD, Martin JB, Kasper DL, et al, eds. *Harrison's principles of internal medicine*. 14th ed. New York: McGraw-Hill Book Co., 1998: 2163-2165.