

# Solitary Gouty Tophus of the Distal Interphalangeal Joint of the Little Finger

## —A Case Report—

K. HASEGAWA and H. TANAKA

Department of Orthopaedic Surgery, Niigata Prefectural Hospital at Muikamachi, Muikamachi, Niigata 949-66, Japan

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**Summary.** An isolated gouty tophus in the hand is rare, and even more so when it is localized in a finger. A case of a gouty tophus involving only the distal interphalangeal (DIP) joint of the little finger is reported. A draining fistula healed after curettage of deposits of urate crystals. Renal dysfunction and oral administration of a diuretic (furosemide) for ten years is considered to have played a significant role in its etiology.

Numerous surveys have revealed the clinical features of gout. Typically gouty arthritis occurs acutely at the first metatarsophalangeal joint of the great toe of middle-aged men with hyperuricemia. Arthritis of other joints ensue and occasionally develop tophi with chronic infection unless hyperuricemia is controlled within normal limits. The authors treated a rare case of gouty tophus involving only the distal interphalangeal (DIP) joint of the little finger. Its unique clinical features are reported below.

### CASE REPORT

A 77-year-old man first experienced pain and noticed localized swelling of the DIP joint of his left little finger on May 30, 1990. The symptoms gradually became worse, and were followed by the discharge of a pus-like substance from the ulnar side of the DIP joint. The patient visited our clinic one week after the onset of his symptoms. He could not remember ever having injured the finger.

The patient had a history of sick sinus syndrome and heart failure since 1980 and had been fitted with an artificial pacemaker and treated with oral cardiac and furosemide for ten years.

Examination revealed marked swelling and redness around the DIP joint of the little finger with a draining fistula on the ulnar side. Laboratory studies

revealed BUN of 29.4 mg/dl, uric acid of 11 mg/dl, and creatinine of 1.7 mg/dl. Other data were within normal limits.

Radiographs revealed osteolytic lesions involving the distal phalanx base and the middle phalanx head and a punched out lesion on the volar side of the middle phalanx head of the little finger (Fig. 1). A tentative diagnosis of osteomyelitis or suppurative arthritis was made and curettage was performed on July 10.

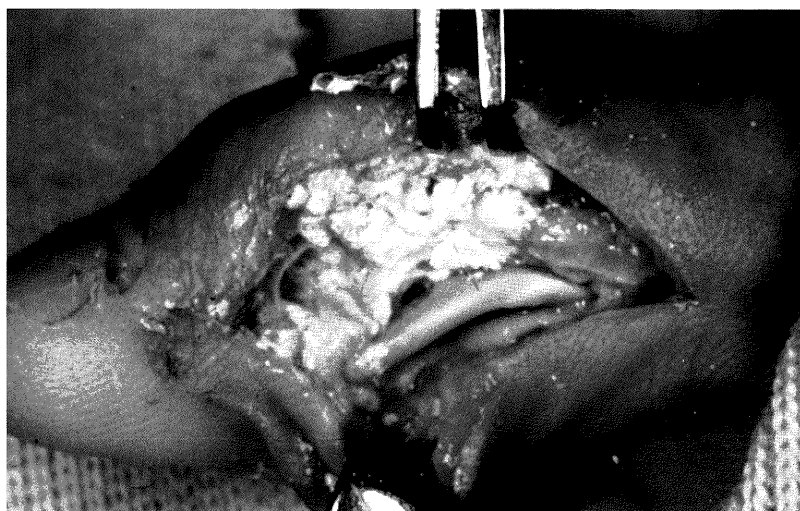
A chalk-like material was found around the DIP joint, but no apparent pus was observed. These findings led to a diagnosis of gouty tophus (Fig. 2). The chalk-like material was completely curetted out, leaving ragged bone and relatively well preserved articular cartilage of the DIP joint. The DIP joint was internally fixed with a Kirschner wire to prevent fracture, and the wound was closed.

The chalk-like material was confirmed to be urate crystals with presence of large number of needle-shaped crystals showing a negatively birefringent feature under polarized light ( $\times 400$ ) (Fig. 3). Cultures of the material were negative.

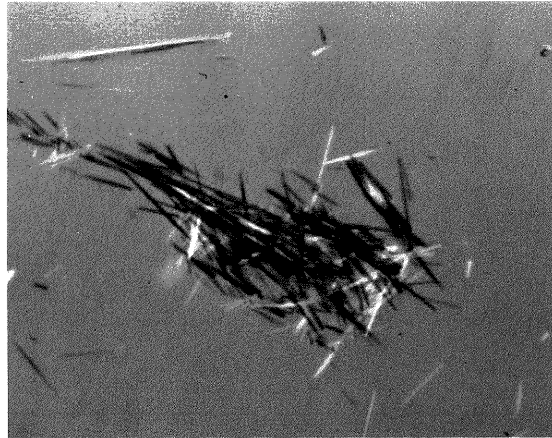
The wound healed primarily. Radiographs taken four months postoperatively showed increased cortical and trabecular volume (Fig. 4). No other gouty tophus or arthritis was found in radiographs of the patient's feet, toes, knees, elbows, contralateral hand, or ears. Kidney function exams revealed diffuse renal dysfunction. The details were as follows: 15 min PSP test, 14%; concentration (Fishberg) test, depressed; creatinine clearance, 25 ml/min. The time of onset of renal dysfunction is unknown because of a lack of laboratory data. Oral administration of allopurinol reduced blood uric acid within normal limits. There has been no recurrence of inflammation as of four months postoperatively.



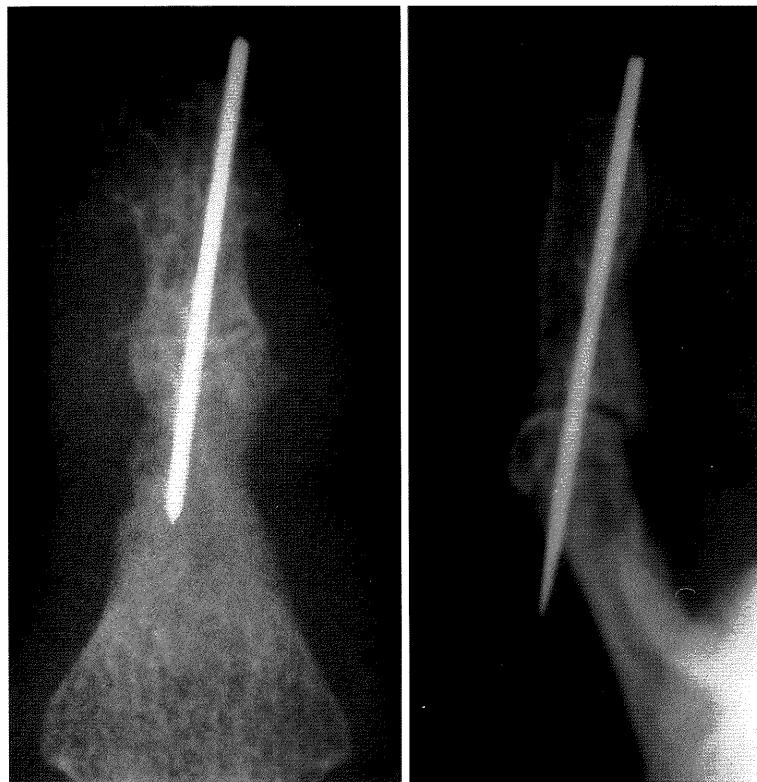
**Fig. 1.** Preoperative radiographs of left little finger reveal osteolytic lesions of the DIP joint (a) and a punched out lesion on the volar side of the middle phalanx (b).



**Fig. 2.** Chalk-like material around the DIP joint. The intact flexor digitorum profundus tendon is observed volar to the chalk-like mass.



**Fig. 3.** Photomicrograph of the chalk-like material under polarized light ( $\times 400$ ), revealing the presence of a large number of needle-shaped negatively birefringent crystals.



**Fig. 4.** Radiographs four months postoperatively show increased cortical and trabecular volume in both AP (a) and lateral view (b).

## DISCUSSION

Iwao et al.<sup>1)</sup> reported 838 cases of gout, in 21 (2.5%) of which gouty tophi were found in the hand. There were no cases, however, of gouty tophi of the hand alone. A limited number of cases of gouty tophus localized only in the hand have been reported by Simkin,<sup>2)</sup> Hollingworth,<sup>3)</sup> Wordsworth,<sup>4)</sup> and Shmerling.<sup>5)</sup>

Our case displayed the following unique features: 1) solitary gouty tophus of the finger; 2) initial gouty attack at an advanced age; 3) having been treated with a diuretic for ten years; and 4) having renal dysfunction. These characteristic features closely resemble those of the cases reported by Shmerling.<sup>5)</sup> Administration of the diuretic (furosemide) and renal dysfunction are believed to have played a significant role in increasing blood uric acid by decreasing the excretion of uric acid, resulting in the onset of acute gouty arthritis. Nevertheless, the mechanism by which urate crystal accumulated only in the finger remains unknown.

In our case, accurate preoperative diagnosis was not made because of the atypical manifestations of the initial attack, which led us to suspect osteomyelitis, suppurative arthritis or tuberculosis. A gouty tophus should have been considered on the basis of the patient's preoperative hyperuricemia.

Concerning the treatment of gouty tophi in the hand, Shmerling<sup>5)</sup> reported a case in which conservative treatment was successful, while Straub et al.<sup>6)</sup>

successfully treated dysfunction and chronic infection due to tophi surgically. Our case was successfully managed by curettage. Since there is a report of a case in which wound healing was delayed when a tophus and draining fistula were treated conservatively,<sup>5)</sup> we recommend surgical removal of the tophus.

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