

## Chronic Tophaceous Gout of the Calf Mimicking Deep Venous Thrombosis

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Gout is a metabolic disease characterized by hyperuricemia, recurrent attacks of acute arthritis and deposits of monosodium urate monohydrate (tophi). Gouty tophi typically deposit in the peripheral regions of the body, especially in toes and fingers. However, it can form at unusual sites and present with atypical clinical features. We here report a very rare case of patient with chronic gout

who developed tophi on the calf and mimicking thrombophlebitis. She was successfully treated with drainage, colchicine and hypouricemic agents. We suggest that large tophi on the calf can be a very rare clinical feature of chronic gout and need careful attention for exact diagnosis and proper treatment.

**Key Words.** Gout, Tophi, Thrombophlebitis

### Introduction

Gout is a common metabolic disease characterized by hyperuricemia, recurrent attacks of acute arthritis, deposition of monosodium urate monohydrate (MSU) crystals in and around the joints (1). The prevalence of gout in Korea has increased abruptly in a short period according to the recent study based on the data of the National Health Insurance Corporation. This study also suggests that most of the patients are males and the age with peak prevalence is gradually getting younger (2). In general, gout develops in individuals with hyperuricemia and risk factors for occurrence of gout include age, high serum level of uric acid, alcohol drinking, and etc (3).

Gouty tophi develop mainly in the peripheral regions of the body with low temperature, such as in toes, fingers and ears (4,5). Recent case series reported that gouty tophi deposition developed at the very rare sites with atypical clinical manifestations, such as the hips (6), spine (7-9) and intra-abdominal gout mimicking pelvic abscess (10). To our knowledge, however, chronic tophaceous gout on the calf has not previously

been reported in the English literature.

We firstly described a case of a 64-year-old woman with chronic gout who developed gouty tophi on the calf mimicking thrombophlebitis and was successfully treated with drainage, colchicine and hypouricemic agents. In addition, we suggest that gouty tophi can very rarely develop in calf and should be differentiated from thrombophlebitis for early adequate management.

### Case Report

The patient was a 64-year-old female with long-standing gouty arthritis and had a 3-week history of fever, left calf pain and swelling with bedridden state. She had suffered from gout for more than 7 years with poor medical control. Physical examination revealed a fever of 39.2 °C and tenderness on the left calf area. Tophi were also noted over the multiple joints, including both sides of elbows, hands, ankles, and great toes. There was no history of trauma and skin discoloration over the skin of the lower extremities. There were diffuse swelling and warmth of left calf with about 6 cm increase in calf circumference more

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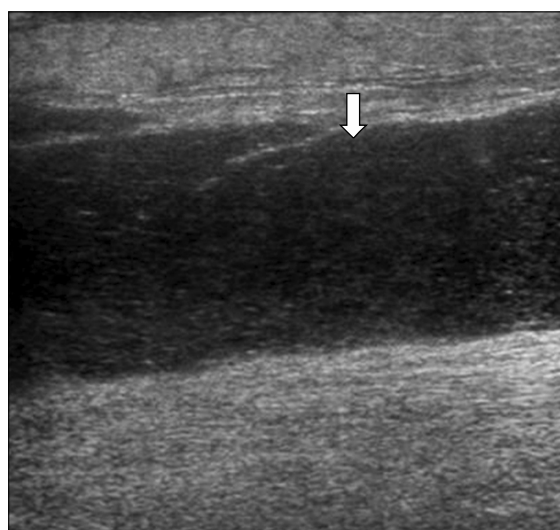
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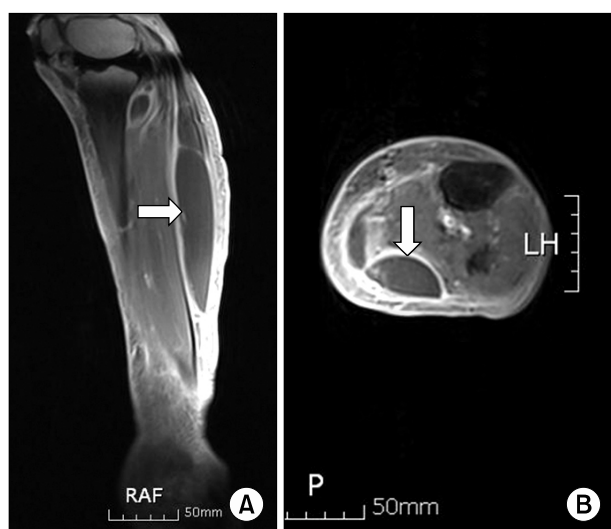
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than the right. Purulent materials were discharged from the right big toe and ankle raising the possibility of secondary infection and cause of persistent fever. Laboratory investigations revealed WBC count of  $20.5 \times 10^3/\mu\text{L}$ , Hb of 10.1 g/dL and a serum uric acid level of 9.3 mg/dL (normal range;  $<6.3$  mg/dL).

Subsequently the patient was treated with intravenous first generation cephalosporine and gentamicin. One week later, she still had severe left calf pain and fever despite treatment with antibiotics. The repeated cultures of discharged materials



**Figure 1.** Ultrasonography of the left calf shows diffuse, high density on the subcutaneous layer, and a hypo-echogenic lesion between the gastrocnemius muscle and subcutaneous deep fascia (arrow).



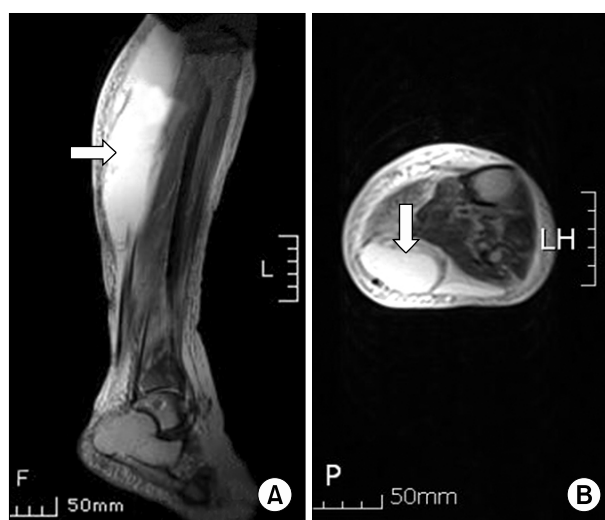
**Figure 2.** T1-weighted MR images of the left calf area show a well-circumscribed, cystic lesion with low signal intensity (arrows), between the gastrocnemius muscle and the deep fascia of calf, in sagittal (A) and coronal views (B).

were all negative. Ultrasonography of left calf shows diffuse increased echogenicity suggesting edematous change and large amount of fluid collection between calf muscle and deep fascia (Figure 1). T1-weighted MRI of coronal and sagittal view showed low signal intensity on the cystic lesion (Figure 2A and B). High signal intensity of cystic lesion in calf was seen on T2-weighted MRI of coronal and sagittal section without abnormalities on vascular structures (Figure 3A and B). For exact diagnosis of cystic lesion on left calf area, ultrasound-guided aspiration was performed. Needle-shaped crystals with negative birefringence were observed on the polarized light microscopy. Cultures for Gram-positive/negative bacteria, tuberculosis and fungus were all negative.

She was diagnosed as chronic tophaceous gout in the calf and was prescribed with colchicine, allopurinol and benzbromarone. Then calf pain and swelling, and laboratory abnormalities were gradually improved with the treatment. She was followed up for more than 10 months without recurrence of any symptoms associated with gout in the calf.

### Discussion

Deposition of aggregates of monosodium urate monohydrate crystals is the most characteristic feature of chronic tophaceous gout. The gouty tophi usually develop in and around peripheral joints with low temperature, including toes, fingers and ears (1,4). Recent case reports indicated that deposition of gouty tophi could develop at the very rare sites with atypical clinical manifestations, such as hips (6), spine (7-9), and



**Figure 3.** T2-weighted MR images of the left calf area show a well-circumscribed, cystic lesion with high signal intensity (arrows), between the gastrocnemius muscle and the deep fascia of the calf, in sagittal (A) and coronal views (B).

intra-abdominal cavity (10). To our knowledge, however, chronic gout having tophi in calf has not previously been reported in the English literature. We firstly report a case of a 64-year-old woman with chronic gout having tophi in the calf mimicking thrombophlebitis. And we suggest that tophi in calf can develop in chronic gout and should be considered as a rare clinical feature of the disease for early diagnosis and adequate management.

Although the tophi are commonly found in articular and peri-articular structures such as synovia, cartilage, and tendon sheaths, it can be found extra-articularly in epiphyseal bone, subcutaneous region, and interstitial areas of the kidney. The mechanisms of accumulation of urate crystals in the rarely developing sites as opposed to the appendicular skeleton are not well known. The pathogenesis of tophi deposition may relate to local tissue changes and it has been suggested that irrespective of the tissues affected, a previous injury or tissue necrosis is a prerequisite for urate deposition (8). Therefore unknown trauma or other diseases in the calf may be a possible cause of urate crystals deposition in this patient.

Clinical risk factors for developing tophi at the unusual sites were not well known and may be drawn from a review of the cases reported until now. To consider the 3 cases of unusual tophi of spine and pelvic cavity, common characteristics were that all were males suffering from polyarticular gouty arthritis and poorly controlled gout with high level of serum uric acid (7-10). In other report with spinal gout, the majority of patients (82%) had chronic polyarticular tophaceous gout and hyperuricemia, with a mean duration of disease of 14 years (range, 0 to 35 years) (8). However, there were no association with age and sex in this report. This is the first case of chronic tophaceous gout involving calf area which developed in postmenopausal woman. This patient had some risk factors described above, including polyarticular gouty arthritis, poor control of gout and high level of serum uric acid.

The painful swelling of calf can be associated with soft tissue trauma, infection, rupture of Baker's cyst and thrombophlebitis. The most important point to consider is the possibility of unnecessary anticoagulation and surgical exploration. There was no history of trauma or severe inflammatory arthritis in left knee joint. The MRI and ultrasonographic findings of vasculatures of lower extremities could exclude the possibility of thrombophlebitis. However, patient's history of gout was considered to determine the cause of differential diagnosis of painful calf swelling. It was reported that secondary infections of gouty tophi in the extremities were not uncommon and could be frequently underrecognized (11,12). The predisposing factors are rupture of subcutaneous tophi with secon-

dary wound infection and concomitant medical diseases such as diabetes mellitus and immunocompromised state (12). This case had no cutaneous wound or ruptured tophi in the calf, and also there were no medical condition mentioned above. All the cultures for Gram-positive/negative bacteria, tuberculosis and fungus were also negative. Due to the presence of numerous monosodium urate crystals with negative birefringence in the aspirated fluid from the calf area, gout was diagnosed and complete drainage and medical treatment with colchicines and hypouricemic agents improved the symptoms. Careful examination and consideration of the rare expression of gouty tophi in unusual sites may yield the correct diagnosis and treatment without unnecessary interventions.

### Summary

We herein reported a rare case of patient with chronic tophaceous gout in the calf which was successfully treated with drainage, colchine and hypouricemic agents. Careful review of constellation of clinical features is needed to differentiate from thrombophlebitis and other causes of painful calf swelling, and thus unnecessary and potentially dangerous anticoagulation or surgical intervention could be avoided.

### References

1. Braunwald E, Fauci AS, Kasper DL, Hauser SL, Longo DL, Jameson JL. Harrison's principles of internal medicine. 17th ed. p. 2165-7, New York, McGraw-Hill, 2008.
2. Lee CH, Sung NY. The prevalence and features of Korean gout patients using the national health insurance corporation database. *J Rheum Dis* 2011;18:94-100.
3. Kim EH, Jeon K, Park KW, Kim HJ, Ahn JK, Jeon CH, et al. The prevalence of gout among hyperuricemic population. *J Korean Rheum Assoc* 2004;11:7-13.
4. Beers MK, Berkow R. The Merck manual of diagnosis and therapy. 18th ed. p. 768-79, Centennial edition. West Point, Pa, Merck, 2006.
5. De Yoe BE, Ng A, Miller B, Rockett MS. Peroneus brevis tendon rupture with tophaceous gout infiltration. *J Foot Ankle Surg* 1999;38:359-62.
6. Yochum TR, Rowe LJ. Essentials of skeletal radiology. 3rd ed. p. 955-68, Baltimore, Williams & Wilkins, 2004.
7. Paquette S, Lach B, Guiot B. Lumbar radiculopathy secondary to gouty tophi in the filum terminale in a patient without systemic gout: case report. *Neurosurgery* 2000; 46:986-8.
8. Bonaldi VM, Duong H, Starr MR, Sarazin L, Richardson J. Tophaceous gout of the lumbar spine mimicking an epidural abscess: MR features. *AJNR Am J Neuroradiol* 1996;17:1949-52.
9. Bang SY, Jeong JH, Joo KB, Jun JB, Sung YK. A case of the lumbar spine involvement and sacroiliitis in a patient with gout. *J Korean Rheum Assoc* 2009;16:318-22.

10. Chen CH, Chen CK, Yeh LR, Pan HB, Yang CF. Intra-abdominal gout mimicking pelvic abscess. *Skeletal Radiol* 2005;34:229-33.
11. Lee CH, Chen YJ, Ueng SW, Hsu RW. Septic arthritis of the ankle joint. *Chang Gung Med J* 2000;23:420-6.
12. Yu KH, Luo SF, Liou LB, Wu YJ, Tsai WP, Chen JY, et al. Concomitant septic and gouty arthritis--an analysis of 30 cases. *Rheumatology (Oxford)* 2003;42:1062-6.