Case Report

Gouty Tophi Caused Limited Knee Range of Motion: A Case Report

Chusak Kijkunasathian MD*,
Patarawan Woratanarat MD, PhD*, Nadhaporn Saengpetch MD*

** Department of Orthopaedics, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*

Background: *Gout is a disease of purine metabolism characterized by monosodium urate crystal deposition. Gouty tophi can mimic many conditions such as infection or neoplasm.*
Objective: *We descriptively presented a case of a 29-year-old male with gouty toph. Data was obtained from patient chart. This patient presented with limited knee joint range of motion after sport injury. Arthroscopic examination was performed in order to confirm the diagnosis of the meniscal injury.*
Results: *The result showed the synovium with white toothpaste-like chalky urate crystals in the joint cartilage.*
Conclusion: *An atypical presentation of gouty tophi can sometime mislead to diagnose an internal derangement of the knee.*

Keywords: *Gout, Tophi, Arthroscopy, Knee, Limit range of motion, Locking*

J Med Assoc Thai 2009; 92 (Suppl 6): S264-7
Full text. e-Journal: *http://www.mat.or.th/journal*

Gout or gouty arthritis is a metabolic disorder caused by an abnormal purine metabolism resulting in an excess uric acid in the blood (hyperuricemia), which leads to the formation of monosodium urate crystal on the articular cartilages of joints and tissues like tendon. The clinical manifestations include arthritis, soft tissue masses (*i.e.* tophi), nephrolithiasis, and urate nephropathy. Gout is considered to progress through four clinical phases characterized by asymptomatic hyperuricemia, acute gouty arthritis, intercritical gout (interval between acute attacks) and chronic tophaceous gout. As described above, gouty tophi are the deposits of urate crystal. These deposits are usually found on the external ears, fingers, and toes, which can be palpated like a movable mass.

The predominant symptoms of gouty tophi vary from asymptomatic to chronic persistent pain[1,2]. Previous studies have emphasized that gouty tophi can mimic as an epidural infection[3,4]. Subcutaneous tophi are usually a late clinical manifestation of gout. However intra-articular tophi may develop early without any gouty attack[5]. We herein reported a case of a 29-year-old man who had neither symptom of acute gouty attack nor subcutaneous tophi with limited knee joint range of motion after sport injury. Gouty tophi were the cause of limited knee joint range of motion.

The purpose of this study was to demonstrate atypical presentation of gout tophi in the knee that should be considered as the differential diagnosis of mechanical symptoms of the knee.

Material and Method

We used a case report approach to descriptively present the atypical appearance of gout tophi in the knee.

Results

A 29-year-old man presented with pain at the left knee for 2 years. He sustained a left knee injury from football game two years ago. His affected knee was marked swelling, with difficulty to perform a fully straight leg or bend more than 90 degrees. A joint fluid aspirated by a general practitioner established clear yellowish color. Unfortunately, the microscopic examination was not done. Conservative treatment with non-steroidal anti-inflammatory drugs (NSAIDs) at

Correspondence to: Kijkunasathian C, Department of Orthopaedics, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok 10400, Thailand. Phone: 0-2201-1589, Fax: 0-2201-1599, E-mail: rackn@mahidol.ac.th

clinic and hospital settings had failed. During 2 years he had felt pain in his left knee while he was trying to straight, bend and move the affected knee. His left leg went limp with in flexion posture. Over 2 years ago he had no previous joint pain or accident.

On initial visit to our clinic, physical examination of the left knee revealed flexion contracture and tenderness at both joint lines. Extension and flexion range of motion of the left knee was remarkably limited to between 15 and 80 degrees (normal range, 0-140 degrees), respectively. Meniscus test could not perform because of severe pain. No joint effusion and subcutaneous nodules or tophi on examination were detected. The differential diagnosis was locked meniscus tear.

Plain radiographic changes showed non-specific findings, while magnetic resonance imaging (MRI) performed to rule out the presence of a torn meniscus showed a partial tear of the anterior and posterior cruciate ligament, associated with mass-likes lesions at lower half of the anterior cruciate ligament. Diffuse synovitis of the knee was seen with small effusion.

Laboratory test results were within normal limits except for a high serum uric acid value of 10.20 mg/L (normal, 3.47-7.15 mg/L).

Arthroscopic examination also revealed the synovium with the white toothpaste-like chalky urate crystals in the joint cartilage (Fig. 1). Urate crystals were also located at the intercondylar notch and in front of the anterior cruciate ligament (Fig. 2). Both menisci were normal. Joint fluid analysis showed urate crystal. The diagnosis was confirmed by histological examination showed the urate crystals deposited at the synovium.

The usual treatment consisted of continuous allopurinol and anti-inflammatory drugs including Naprosyn to controlling pain symptom for 1 Yr. After this treatment, the full range of motion of the knee was restored and the gait came eventually normal.

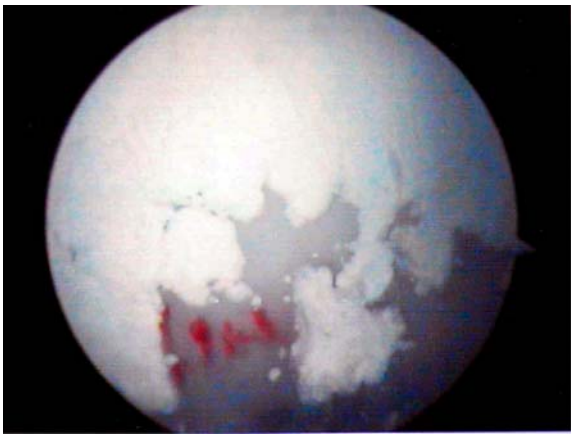

Fig. 1 Deposition of uric crystals in articular cartilage

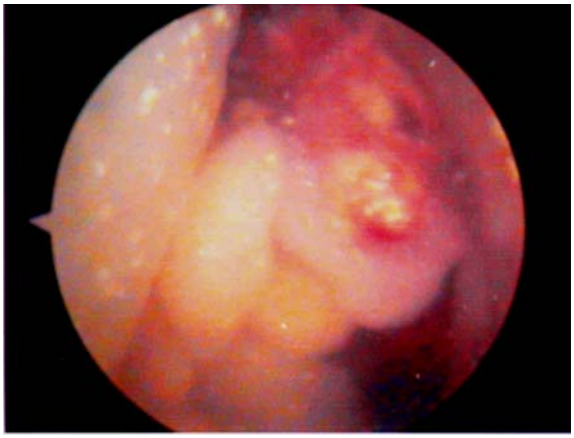

Fig. 2 Gouty tophi blocking knee excursion located at anterior to cruciate ligament

Discussion

It has been suggested gouty tophi has been shown the great mimic for its ability to resemble other conditions such as infection[3,4] and neoplasm[1]. In this case, the focus had been on the clinical picture and the MRI appearance, which resulted in misdiagnosis of ligamentous and meniscal injury.

Among young adults, the most common etiology of limited knee range of motion are the following: meniscus injury, chondral or osteochondral fragment, secondary osteoarthritis with loose body and synovial chondromatosis. The most common symptoms of meniscus injury are pain worsen with squatting, periodic effusion and restricted knee range of motion. Studies have been shown that joint line tenderness (JLT), McMurray and Apley's test are not diagnostically accurate in detecting a meniscus injury[6,7], whereas MRI is very helpful in diagnosing meniscal and cruciate ligament injuries[8].

Gouty tophi in the knee joint generally appear in patients with chronic pain and limited knee range of motion[9]. In a case series done by Yu et al[10], they found that gouty tophi can limit knee range of motion with an average age of onset was 31.6 (range 23-47). Most of the patients had known diagnosis before having history of knee pain. Duration of symptom

ranged from 2 to 16 years (mean, 9.7 ± 5.8). Subcutaneous tophi were found in 5 of 7 patients. However, the patient in the present study was not display any knee symptoms or subcutaneous tophi.

Tophi deposits are well defined to cause joint destruction. This study reports another important complication of gout to limit knee range of motion by intraarticular gouty tophi which were previously reported[9-11] that which is frequently overlooked due to a lack of visible subcutaneous tophi at the knee joint. Gouty tophi can also occur at the knee joint without an acute gouty attack[5]. Nevertheless, intra-articular tophi may develop early without visible subcutaneous tophi[10]. Therefore, tohpi deposition should be considered not only in patients with chronic severe tophaceous gout but also in those with early gout.

Typical plain radiographic features of gout include soft tissue swelling, calcification and bony erosion. However, these plain radiographic features of gout generally are negative in early and even in some chronic gout patients with intraarticular deposits. In these cases, MRI may be helpful but the diagnosis is difficulty[12,13]. Identification of monosodium urate crystals in gouty synovial fluid is considered to be the gold standard for definitive diagnosis of gout[14]. Differential diagnosis based on joint aspiration may allow a correct diagnosis in this patient. However, this procedure could not be performed because of a borderline or the minimal effusion in the patient's knee.

Knee locking caused by gouty tophi is successfully treated with arthroscopic debridement of the knee. In case the appearance of gouty tophi in subcutaneous tissue, conservative treatment or medicinal therapy should be considered. Chatterjee et al reported the patient with painful knee locking caused by gouty tophi, declining an arthroscopic procedure to remove tophi, was successfully treated with conservative treatment.[15] The treatment consisted of continuous allopurinol therapy and symptomatic treatment such as pain killer and anti-inflammatory drugs. Thus an accurate diagnosis may be avoided the unnecessary operation.

References

1. Li TJ, Lue KH, Lin ZI, Lu KH. Arthroscopic treatment for gouty tophi mimicking an intra-articular synovial tumor of the knee. Arthroscopy 2006; 22: 910-3.
2. Melloni P, Valls R, Yuguero M, Saez A. An unusual case of tophaceous gout involving the anterior cruciate ligament. Arthroscopy 2004; 20: e117-21.
3. Barrett K, Miller ML, Wilson JT. Tophaceous gout of the spine mimicking epidural infection: case report and review of the literature. Neurosurgery 2001; 48: 1170-2.
4. 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.
5. Yu KH. Intraarticular tophi in a joint without a previous gouty attack. J Rheumatol 2003; 30: 1868-70.
6. Hegedus EJ, Cook C, Hasselblad V, Goode A, McCrory DC. Physical examination tests for assessing a torn meniscus in the knee: a systematic review with meta-analysis. J Orthop Sports Phys Ther 2007; 37: 541-50.
7. Konan S, Rayan F, Haddad FS. Do physical diagnostic tests accurately detect meniscal tears? Knee Surg Sports Traumatol Arthrosc 2009; 17: 806-11.
8. Nikolaou VS, Chronopoulos E, Savvidou C, Plessas S, Giannoudis P, Efstathopoulos N, et al. MRI efficacy in diagnosing internal lesions of the knee: a retrospective analysis. J Trauma Manag Outcomes 2008; 2: 4.
9. Espejo-Baena A, Coretti SM, Fernandez JM, Garcia-Herrera JM, Del Pino JR. Knee locking due to a single gouty tophus. J Rheumatol 2006; 33: 193-5.
10. Yu KH, Lien LC, Ho HH. Limited knee joint range of motion due to invisible gouty tophi. Rheumatology (Oxford) 2004; 43: 191-4.
11. Kobayashi K, Deie M, Okuhara A, Adachi N, Yasumoto M, Ochi M. Tophaceous gout in the bipartite patella with intra-osseous and intra-articular lesions: a case report. J Orthop Surg (Hong Kong) 2005; 13: 199-202.
12. Chen CK, Yeh LR, Pan HB, Yang CF, Lu YC, Wang JS, et al. Intra-articular gouty tophi of the knee: CT and MR imaging in 12 patients. Skeletal Radiol 1999; 28: 75-80.
13. Yu JS, Chung C, Recht M, Dailiana T, Jurdi R. MR imaging of tophaceous gout. AJR Am J Roentgenol 1997; 168: 523-7.
14. Hollander JL, Jessar RA, McCarty DJ. Synovianalysis: an aid in arthritis diagnosis. Bull Rheum Dis 1961; 12: 263-4.
15. Chatterjee S, Ilaslan H. Painful knee locking caused by gouty tophi successfully treated with allopurinol. Nat Clin Pract Rheumatol 2008; 4: 675-9.

ก้อนผลึกโรคเกาต์ที่เป็นสาเหตุทำให้เกิดการติดกันของข้อเข่า: รายงานผู้ป่วย 1 ราย

ชูศักดิ์ กิจคุณาเสถียร, ภัทรวัณย์ วรธนารัตน์, ณัฐพร แสงเพชร

ภูมิหลัง: *เกาต์เป็นโรคที่เกิดจากความผิดปกติของการสะสมผลึกยูเรท ก้อนผลึกโรคเกาต์ที่เกิดจากการสะสมของกรดยูริกในเนื้อเยื่อต่าง ๆ ทำให้โรคมีอาการคล้ายกับโรคอื่น ๆ ได้ เช่น เนื้องอก ภาวะติดเชื้อ*

วัสดุและวิธีการ: *การศึกษานี้ใช้กระบวนการการรายงานผู้ป่วย จำนวน 1 ราย โดยใช้ข้อมูลย้อนหลังจากเวชระเบียนของผู้ป่วย*

ผลการศึกษา: *ผู้ป่วยชายอายุ 29 ปี ซึ่งมีก้อนที่เกิดจากการสะสมของกรดยูริกในข้อเข่า ทำให้เกิดการติดของข้อเข่าหลังจากอุบัติเหตุ โดยผู้ป่วยรายนี้ได้รับการส่องกล้องเพื่อยืนยันการวินิจฉัยว่าผู้ป่วยมีอาการบาดเจ็บที่หมอนรองเข่า*

สรุป: *อาการแสดงที่ผิดปกติของก้อนผลึกในโรคเกาต์สามารถทำให้เกิดการสับสน ในการวินิจฉัยของการบาดเจ็บของโครงสร้างภายในเข่าได้*