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Arthroscopic image of tophaceous gout of the knee: A case report

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Abstract

Tophaceous gout is a crystal arthropathy and a disorder of purine metabolism characterized by monosodium urate crystal deposition. Most of the patients are asymptomatic in the inter-critical period. Gout mostly affects the small joint of the foot. Large joints like knee may be affected by gout but its arthroscopic picture has not been widely reported in the literature. We here present a case of tophaceous deposits in the knee joint found out on diagnostic arthroscopy confirmed as gout by histopathological examination of synovium and comparison of the present case with existing literature.

Keywords: Gout, arthroscopy, knee joint, crystal deposition, crystal arthropathy, diagnostic arthroscopy

Introduction

Tophaceous gout is a type of crystal arthropathy characterized by elevated blood uric acid levels resulting in urate crystal deposition. Gout has a strong male predilection and constitutes the most common cause of inflammatory arthritis affecting males ^[1]. This condition is caused by elevated levels of uric acid in the blood which likely occurs secondary to a combination of diet and genetic factors ^[2]. Acute gouty arthritis typically presents with sudden onset of a painful, erythematous and swollen joint. Classically the most common joint to be involved is the 1st meta-tarso phalangeal joint, but other joints may also be involved ^[2]. Acute gouty arthritis is typically mono-articular, however with subsequent episodes, multiple joints can be affected. Tophaceous gout can present with pain, locking of joints, subcutaneous nodule formation, joint destruction, soft tissue deformity or contracture.

Medical management of acute gouty arthritis is primarily with non-steroidal anti-inflammatory drugs (NSAIDs) as first line agent. Once the acute attack has been subsided drugs like xanthine oxidase inhibitors and uricosuric drugs can be prescribed in addition to lifestyle changes ^[3]. Arthroscopic intervention for tophaceous deposits of knee has been reviewed in the literature, mostly through case reports ^[4, 5]. We present a case of tophaceous gout of knee diagnosed retrospectively after a diagnostic arthroscopy and synovial biopsy of knee.

Case report

We report a case of a 42 year old male patient with a complaint of pain and swelling left knee since 2 years which was insidious in onset and intermittent. Patient has been presented to us on October 2022 to our OPD. Pain was not relieved from the past 6 months which made the patient to visit our OPD. There was no history of fever, early morning stiffness, loss of weight or appetite. On examination there was diffuse swelling of left knee with quadriceps wasting. No local rise of temperature was found. Patellar tap was positive and tenderness was elicited. Terminal flexion of knee was restricted. Our initial diagnosis was mono-articular tuberculosis and other differential diagnosis were early osteoarthritis with acute synovitis and non-specific synovitis. Blood parameters and inflammatory markers were within normal limits except for the raised CRP levels. Mantoux was negative. Plain radiography was normal (Fig 1). We have planned for an arthroscopic assisted synovial biopsy in search for definitive diagnosis.

Under spinal anesthesia patient supine with 90° knee flexion diagnostic arthroscopy was done and was found to have diffuse synovial proliferation and there were silver foil sheets like deposits over the femoral condyles and articular surface of patella which were consistent to be as tophaceous gout (Fig 2, 3). Synovial biopsy (Fig 4) was sent which was reported as Gouty arthritis.

Discussion

Gout is a common condition in the population today. Synovial fluid analysis performed on asymptomatic patients during the inter-critical period (time between attacks or flares) have demonstrated elevated levels of monosodium urate crystals [6]. However synovial fluid analysis performed in our patient was normal. Most hyperuricemia patients are asymptomatic and untreated. Subcutaneous tophi occur in patients with long duration of gout and high serum urates [7] and it can be that the presence of intra-articular tophi is related to long gout duration. Though the most common site of crystal deposition is metatarso phalangeal joint, it can also affect other large joints such as knee and elbow. Several cross sectional studies have shown that joints affected by acute gouty arthritis are

more likely to manifest chronic pain and clinical or radiographic osteoarthritis with knee being a common site of involvement [8]. In particular a knee joint that was also affected by an acute attack of gout had a 3-fold increased likelihood of having concurrent knee osteoarthritis that was clinically diagnosed [8]. Tophi have been reported in 10% of gout patients [9]. Some reports have been published where in these tophi have organized to form a mass (Table 1). Our case has no evidence of formation of tophaceous mass apart from chalky white deposits visualized on diagnostic arthroscopy. On diagnostic arthroscopy the macroscopic appearance of the deposits on the synovium and bone were chalky white deposits or silver foil sheet like appearances which were consistent with systematic review of literature by Patapong Towiwat *et al.* [17]. On histopathological examination under light microscopy acute synovial inflammation was evident with eosinophilic proliferation. Our patient was retrospectively evaluated for serum uric acid post operatively and showed higher serum uric acid levels. We have started him on oral febuxostat and NSAIDS. Further follow up period of the patient was uneventful.

Table 1: Comparison of the present case against published cases [9-16]

Author Name	Age/ Sex	Chief Complaint	Clinical Finding	Radiological Finding	Provisional Diagnosis	Differential Diagnosis	Other Investigations Performed	Final Diagnosis	Outcome
Kobayashi K <i>et al.</i> [9]	34/M	Knee pain and swelling	ROM 0-20 muscle atrophy of thigh	Biparitate patella bone-cyst like swelling	Gouty tophi	-	Histologic examination	Gouty tophi	Arthroscopic excision: Improved outcome
Li TJ <i>et al.</i> [10]	53/M	Knee pain swelling	Some effusion ROM: 5-120 Tenderness Present	Normal	Synovia l neoplasm	PVNS	Histologic examination	Gouty tophi	Arthroscopic excision
Alejandro EB <i>et al.</i> [11]	53/M	Knee pain, locking	Unable to full extension	Normal	Meniscal lesion	-	-	Gouty tophi	Arthroscopic excision
Soumya C and Hakan I [12]	67/M	Knee pain swelling locking	Unable to fully extend and flex	Mild Osteo-arthritis	Meniscal lesion	Torn cruciate ligament loose body	CT: Soft tissue calcification	Gouty tophi	Only medication-improved outcome
Amber H, <i>et al.</i> [13]	29/M	Knee pain swelling locking	ROM: 30-100	Normal	Synovial sarcoma	PVNS infectious arthritis amyloidosis	Histologic examination	Gouty tophi	Arthroscopy
Raymond GS <i>et al.</i> [14]	42/M	Knee pain locking catching	ROM upto 20 degree-flexion	Mild Osteo-arthritis	Meniscal lesion	-	-	Gouty tophi	Arthroscopic excision: Improved outcome
Naokiishida <i>et al.</i> [15]	33/M	Knee pain and swelling	ROM: 40-80	Normal	Synovial mass (tumour)	-	Histologic examination	Gouty tophi	Arthroscopy
Evan Daniel curd <i>et al.</i> [16]	29/M	Pain at left knee	Effusion, extensor lag of 5 degrees	Normal	PVNS	-	MRI	Gouty tophi on anterior cruciate ligament	Arthroscopic excision: Improved outcome
Present study	42/M	Pain at left knee and swelling	Knee effusion	Mildosteoarthritis	Non-specific synovitis	TB knee	Histologic examination	Gout y tophi	Arthroscopy and medical management: Improved outcome

CT: Computed Tomography, ROM: range of motion, PVNS: pigmented villonodular synovitis.



Fig 1: Plain radiograph of the patient

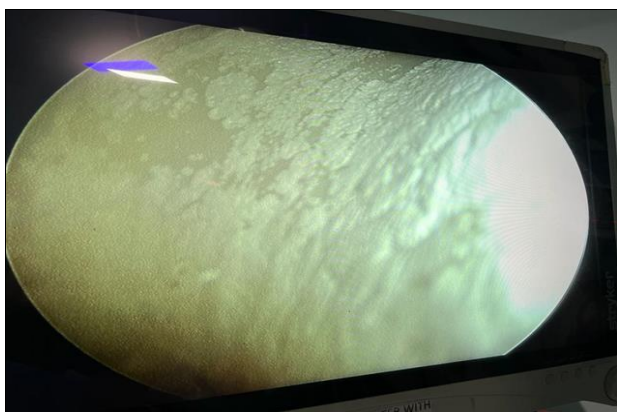


Fig 2: Arthroscopic image showing deposits of tophi

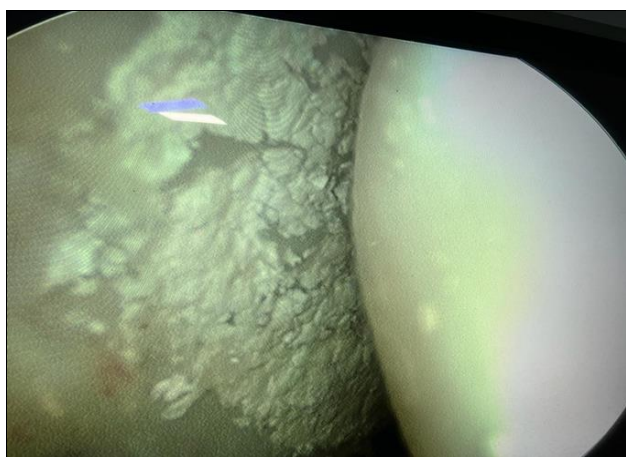


Fig 3: Arthroscopic image showing deposits of tophi

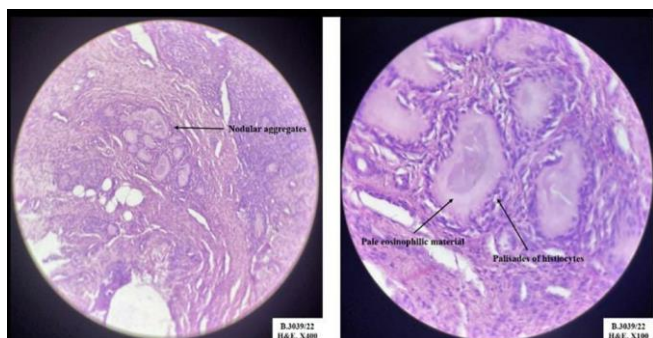


Fig 4: Microscopic picture of the specimen (synovium) showing eosinophilic proliferation

Conclusion

We report an unusual presentation of gout as mono-articular joint swelling. Gouty tophi are difficult to diagnose due to their ambiguous nature in conventional imaging. Also atypical presentation of tophaceous gout can sometimes be misdiagnosed as non-specific synovitis or tubercular synovitis. Diagnostic arthroscopy and arthroscopic assisted synovial biopsy are a good tool of investigative modality in a long standing case of synovitis.

Conflict of Interest

Not available

Financial Support

Not available

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