CASE REPORT

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Tophi gout around the knee joint: An unusual presentation with a soft tissue mass

Feyza Unlu Ozkan, Kerem Bilsel, Ismail Turkmen, Mehmet Erdil, Salih Soylemez, Korhan Ozkan

ABSTRACT

Introduction: Gout is the most common inflammatory arthropathy. It has been reported to affect 2.13% of population in the United States. In this report, we presented an uncommon case of tophaceous gout of the knee presenting as a soft tissue mass. **Case report:** A 57-year-old male patient with knee pain and localized progressive swelling increasing in time on the medial side of the proximal tibia was seen in our clinic. He did not have any rheumatologic disease known previously except gout arthritis. Excisional biopsy was performed by preserving medial collateral ligament and histopathologic investigations were done next. A tophaceous gouty deposit was identified by low-power photomicrograph. A bluish amorphous material was seen surrounded by bundles of dense collagenized tissue and chronic inflammatory cells. Surrounding the amorphous crystalline deposit is a thin layer of mononuclear and giant cells. Photomicrograph of another section has been stained by de Galantha's method for demonstration of monosodium urate crystals. **Conclusion:** Especially in patients with extra-articular or subcutaneous mass, tophaceous gout must be considered as differential diagnosis.

Keywords: Tophi gout, de Galantha's method, Tophaceous gout, Gout arthritis

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INTRODUCTION

Gout is the most common inflammatory arthropathy reported to affect 2.13% of population in the United States [1]. In this report, we presented an uncommon case of tophaceous gout of the knee presenting as a soft tissue mass.

CASE REPORT

A 57-year-old male presented with knee pain and localized progressive swelling increasing in time on the medial side of the proximal tibia. Initially, he was examined by a physiotherapist and treated conservatively. After that he had come to our polyclinic with increased complaints. Physical examination of the knee revealed well circumscribed, solid, measuring approximately 5x5 cm, non-mobile soft tissue mass. The patient has no limitation of the joint motion. The mass was on the proximal tibial metaphyseal region, it was located subcutaneously and vicinity of bone. It was hard and fixed with smooth border by palpation. The blood uric acid levels were in normal range. His past history revealed that the patient had been using colchicine for 15 years. A year before, he had traffic accident and had injured his right knee with no fracture. In radiological assessment (X-ray

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and magnetic resonance imaging (MRI)) a fusiform shaped mass was determined on pes anserinus bursa which had stretched patellar retinacula (Figure 1A–C). Calcific myonecrosis, pigmented villonodular synovitis, calcinosis, gout tophus and especially synovial sarcoma were considered as differential diagnosis.

An excisional biopsy was planned. A longitudinal incision was made along the length of anteromedial side of proximal tibia. Tumor mass was completely excised with insertion of medial collateral ligament. There was an eroded area underlying the mass on proximal medial tibia but without a lytic area. The tumor and the eroded area of the bone extirpated via a curved osteotome. The remaining (proximal) part of medial collateral ligament was reattached to the tibia by suturing using fiber wire through previously prepared drill holes.

Histopathologic investigations were done next. A tophaceous gouty deposit was identified by low-power photomicrograph. A bluish amorphous material is seen surrounded by bundles of dense collagenized tissue and chronic inflammatory cells. The field examined by polarized light. The birefringence of the crystalline material was evident. Surrounding the amorphous crystalline deposit was a thin layer of mononuclear and giant cells. Photomicrograph of another section had been stained by de Galantha's method for demonstration of monosodium urate crystals (Figure 2).

Figure 2: Macroscopic and microscopic histological images of the mass.

Figure 1: (A) X-ray and (B,C) Magnetic resonance imaging (MRI) scan of the mass. Anteroposterior diameter 54 mm, craniocaudal length 48 mm, mediolateral diameter: 12 mm.

DISCUSSION

Gout is an inborn error of purine metabolism characterized by hyperuricemia and recurrent attacks of acute arthritis. If hyperuricemia persists for a long time, tophaceous deposits may be found in the subcutaneous tissues and the various joints, particularly the first metatarsophalangeal joint, the hand, wrist, or elbow [2–5]. Tophaceous deposition has been reported in various locations such as finger pads, Sacroiliac joint, carpal tunnel, ankle, shoulder, dorsum of the feet, multiple

subcutaneous nodules, knee, acromioclavicular joint and axial skeleton [3–14]. A recent study suggested that the frequency of axial involvement may be as high as 14% in patients with clinical or crystal-proven gout [15]. The rate of appearance of gross tophaceous deposits is a consequence of the gout disease and the degree of hyperuricemia [6].

Patients might have such complaints; warmth, pain, swelling and extreme tenderness in a joint, limited motion in the affected joint which mimics septic arthritis symptoms [4]. Chronic tophaceous gout classically occurs after 10 years or more of recurrent polyarticular gout. However, demonstrating tophi as the initial clinical presentation of gout is very rare [8]. Subcutaneous tophi generally occurs as a late clinical outcome and typically located in the peripheral joints of the hand or foot [10]. But subcutaneous tophaceous deposits of monosodium urate, in the absence of arthritis, may occasionally occur as the initial manifestation of gout. In 1996, Iglesias et al. reported a case presented with a 6-year history of multiple subcutaneous nodules and no history of previous articular complaint [16]. They had reviewed literature and found out 28 similar cases that had subcutaneous nodules without any articular complaint and termed this entity of the disease as the 'gout nodulosis'. Bloch et al. in a study review presented 466 patients who had gout arthritis retrospectively [6]. In 84 patients (18%), radiographic findings were positive, but rather suspicious clinically. Thus, it seems that tophi deposition may occur early, even in previously unaffected joints. An earlier correct diagnosis of tophaceous gout could be made incidentally during an arthroscopy or with the help of the radiologist [2, 6].

Tophi are rarely observed in patients without a prior history of gouty arthritis. We describe a patient whose

initial manifestation of gout was tophaceous deposition in an unusual location; medial side of the knee. As far as we know although intra-articular gouty deposits in the knee are common, subcutaneous nodules are rare [10]. Our patient did not have a history of acute gouty arthritis tophi elsewhere. Tophaceous gout without arthritis might be more common than previously recognized. For diagnosis of gouty deposits in and around the knee plain radiographs, MRI and computed tomography (CT) [5, 9, 17] scan can be used. The plain radiographs show asymmetrical soft tissue swelling, calcification and bone erosion [17]. These plain radiographic features generally are normal in early and even chronic gout patients with intra-articular deposits and bone erosions [6]. Tophaceous deposits present as masses on MRI scan with low to intermediate signal intensity on both T1- and T2-weighted images and a characteristic enhancement pattern following intravenous Gd administration. These features relate primarily to internal calcifications, which are most evident on CT scans. Magnetic resonance imaging scan (including Gd administration) supplemented, in some cases, with CT scan allows accurate diagnosis of intra-articular tophaceous deposits [9]. Monosodium urate (MSU) deposits within a tophus can be clearly defined with CT scan. Computed tomography scan discloses round and oval opacities in the tophi [17].

Gout is marked by transient attacks of acute arthritis initiated by crystallization of urates within and about the joints [18–21]. Although peri- and intra-articular structures are involved in the knee visible subcutaneous lesions are extremely unusual [22]. The soft tissue lesions of the tophaceous gout can have similar appearances to calcinosis of chronic renal failure, synovial sarcoma, osteosarcoma, calcific myonecrosis, myositis ossificans and tumoral calcinosis, so medical history of the patient is essential to evaluate the origin of these lesions and to detect the possible etiology.

Synovial sarcomas are most commonly seen in large joints. They originate from bursal and tendinous structures [23]. These were, most frequently, incorrectly diagnosed as bursitis, tendinitis, synovitis or hematoma. In tumoral mass there may be mineralization and also this calcification can be also seen on X-ray.

In some cases the underlying bone is affected and erosions can be seen [24]. Due to this features, in our case there was a diagnostic dilemma between synovial sarcoma and gout tophi. Computed tomography scan should be applied preoperatively to detect bone erosions that could help to plan the surgery.

CONCLUSION

In such cases, especially in patients with extra-articular or subcutaneous mass, tophaceous gout must be considered as differential diagnosis because tophi gout can mimic all kind of mass on extremities.

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Author Contributions

Feyza Unlu Ozkan – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Kerem Bilsel – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Ismail Turkmen – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Mehmet Erdil – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Salih Soylemez – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Korhan Ozkan – Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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