

An unusual clinical presentation of granulomatous tophaceous gout in the wrist

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The possibility of infection with mycobacterium tuberculosis (TB), and other infectious agents is the first option when granulomatous inflammation was observed in the histological examination of a tissue specimen. However, gout with manifestations of granulomatous synovitis may mimic TB tenosynovitis. An 80-year-old male with a history of hypertension, and gout presented with the swelling of the right wrist, and deformity as a result of trauma. The results of cytology for malignancy, TB polymerase chain reaction (PCR), and TB culture were negative. Histopathological examination with an electron microscope confirmed the diagnosis of tophaceous gout along with granulomatous synovitis. The current case emphasizes the significance of a correct gouty process diagnosis in patients who exhibit granulomatous tophaceous tuberculous tenosynovitis or rheumatoid arthritis. We suggested that gout should be considered in differential diagnosis of granulomatous synovitis, especially in cases with negative mycobacterium TB-PCR.

.HZRUGV Tophaceous; Gout, Synovitis; Granulomatous; Gouty tophi

Introduction

Gout is a metabolic abnormality that can show extra-articular symptoms in the hand, such as nerve entrapment, arthritis, tophaceous infiltration of tendon, joint destruction, skin ulceration, draining sinus, or tenosynovitis. These conditions are in terms of an increased monosodium urate crystal deposition which may create inflammatory arthritis, and subsequently joint damage [1]. Gouty attacks usually occur in a single joint in the lower limb [2]. Gouty arthritis of wrist is an uncommon involvement, but in chronic gouty arthritis can occur which can simulate infection [3].

Therefore, a lack of awareness of this condition can result in an incorrect diagnosis. Tophi, which have been regarded as a defining characteristic of chronic gout that has progressed, are chronic foreign body granuloma-like forms. Tophus is a cluster of monosodium urate crystals encircled by connective tissue and inflammatory cells [4]. The accumulation of monosodium urate crystal in tissues is known as tophaceous gout, which is a later complication of gout in untreated gouty joints [5].

Granulomatous synovitis is a chronic, and relapsing condition, which is often confusing to diagnose. Tuberculous and nontuberculous myc-

mycobacteria are the most common situations that lead to granulomatous synovitis [6]. The possibility of infection with mycobacterium tuberculosis (TB) and fungal infections are the first options when granulomatous inflammation was observed in the histological examination of a tissue specimen. Other alternatives include inflammatory diseases including sarcoidosis, vasculitis, and crystal-associated arthritis. Gout with granulomatous synovitis symptoms, however, might resemble TB tenosynovitis [7]. Hence, an unusual case of gouty wrist in an old male with a prior history of gout with the manifestation of granulomatous synovitis mimicking tuberculous tenosynovitis was reported.

Case Presentation

An 80-year-old male with a history of hypertension, and gout presented with swelling of right wrist and deformity, as a result of falling and trauma about one year ago. During several years involved with gout, the patient was not treated in a standard, and systematic manner. Occasionally, metatarsophalangeal joint 1 (MTP1) arthritis (podagra) had initially occurred. The patient was originally being treated with physiotherapy intervention owing to the deformity of the wrist joint after trauma, and he had been sent to an orthopedist due to a suspected hand fracture after trauma. The patient's hand was splinted for a while; however, there was no history of fracture in plain x-rays. He had received 30 sessions of physiotherapy intervention after trauma. Laboratory evaluation, magnetic resonance imaging (MRI), biopsy, and microbiological evaluation were performed in terms of unresponsiveness. The analyses of serologic markers were performed, and anti-cyclic citrullinated peptides (anti-CCP) levels were reported in units higher than 300. Moreover, C-reactive protein (CRP) level and rheumatoid factor (RF) were positive. The patient was therefore advised to see a rheumatologist despite the fact that his wrist was very swollen. Physical examination revealed limited range of motion, erythema, edema, and deformity in the wrists. Laboratory data checked again in another laboratory and showed anti-CCP level of 3.2 u/mL (up to 20 u/mL is considered negative), and uric acid level of 8.7 mg/dL (normal range: 2.6-7.2

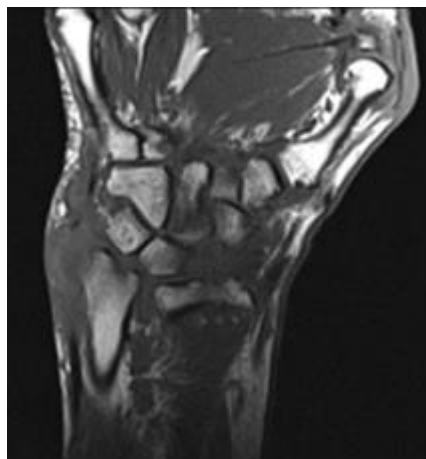
mg/dL). Moreover, erythrocyte sedimentation rate was 50 mm/hr, and RF was negative in second time. Joint aspirations showed a clear and decreased viscous fluid free of crystals with light microscope. Anteroposterior radiographs of the right and left hands revealed narrowing of the joint space, erosion, and disintegration in the right wrist (Figure 1).

Electromyography and Nerve Conduction Velocity tests were undertaken due to paresthesia. Data showed severe carpal tunnel syndrome in the right wrist, and bilateral C5-C6 nerve root was reported in cervical radiculopathy. Ultrasound image indicated swelling in the external carpal ulnar tendon with effusion, and increased synovial thickness. Moreover, calcification at the level of articular cartilage in the first right MTP joint, a soft tissue mass, and tophaceous gout were noted. MRI of the right wrist showed severe degeneration change in the distal carpal joint, loss of joint space, bone marrow edema, and synovial hypertrophy (Figure 2).

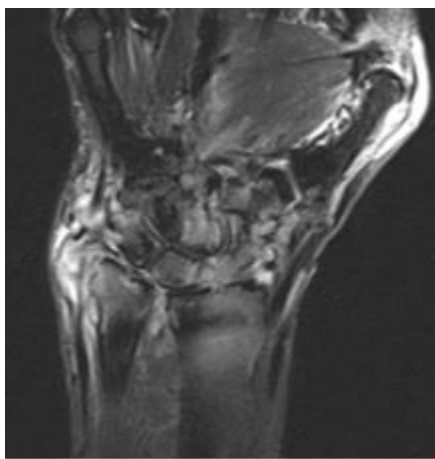
Considering chronic wrist monoarthritis, the patient was referred to perform the synovial biopsy. Both the cytology for malignancy and the PCR for mycobacterium TB and fungus identification yielded negative results. A histopathological analysis revealed monosodium



Figure 1. Anteroposterior imaging of the right hand showing the joint space narrowing involving the radiocarpal, intercarpal, and carpometacarpal joints. Intra-articular erosion in the distal radius and juxta-articular well-marginated erosion at the base of the 2nd metatarsal bone are observed. A dense soft tissue mass is noted at the ulnar side



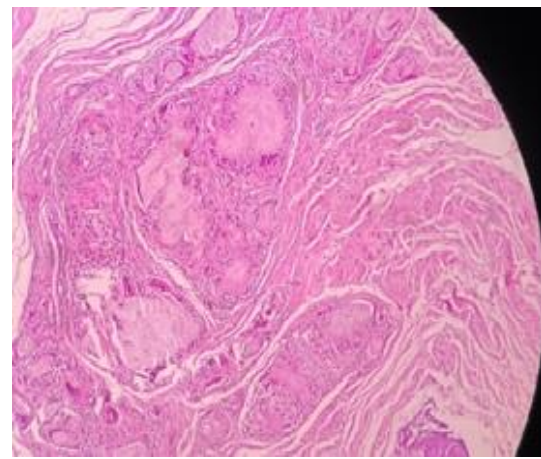
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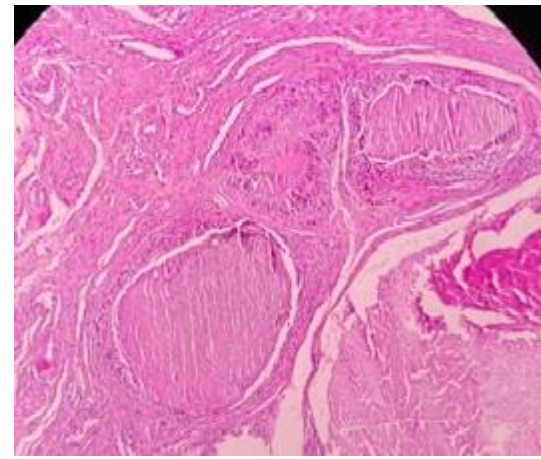
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Figure 2. Magnetic resonance imaging of the cross-section of carpal tunnel showing multiple sites of marrow edema, as well as an ulnar-sided soft tissue mass causing adjacent bone erosion likely representing tophaceous. (A) Coronal T1W (B) Coronal PD fat sat

urate crystals and granulomatous synovitis. Inflammatory infiltration, granuloma foci with epithelioid cell density, Janet with degenerative foci, and a view of eosinophil density, such as uric acid were noted in the histopathological evaluation (Figure 3). Histopathological examination with a light microscope confirmed the diagnosis of phaceous gout along with granulomatous synovitis. Colchicine with dose of 0.6 mg/d was prescribed to the patient. Moreover, two intra-articular triamcinolone (40 mg) were injected into the right wrist. Ten days after treatment, there were no signs of swelling or arthritis, then we started allopurinol (300 mg/d). No evidence of recurrence was observed at a one-year follow-up.



A



B

Figure 3. Histopathological evaluation showing the inflammatory infiltration and granuloma foci with epithelioid cell density, Janet with degenerative foci, and a view of eosinophil density, such as uric acid (Hematoxylin-eosin stain, magnifications: A 20, B, 400.)

Discussion

We present an unusual case of gouty wrist, the diagnosis of which was complicated since it resembled infection manifestations which was suspected to be TB. Our patient was suspected of having tuberculous tenosynovitis (mycobacterial infection) because his symptoms began following a wrist injury, a risk factor for tenosynovitis, which can be caused by tuberculous or nontuberculous mycobacteria [8]. Gouty attacks maybe speed up by trauma, starvation, surgery, alcohol consumption, and use of diuretic drugs [2]. However, cytology, TB culture and TB-PCR results were negative. One of the uncommon manifestations of TB is tuberculous tenosynovitis. A gradual progression of swelling was observed.

According to the presence of monosodium urate crystals and tophus in the pathology examination, the history of ankle swelling, hyperuricemia and tophus in the wrist radiograph, the patient was diagnosed with destructive arthritis caused by gout. Gout may be confused with tuberculous arthritis of the first MTP joint (tuberculous podagra), especially when granulomatous inflammation was observed in tendon sheaths. In this regard, synovial fluid examination, as well as radiographic evaluation can help us correct diagnosis. The mycobacterial culture is crucial to getting the correct diagnosis since granulomatous inflammation may be present in various infectious types of tenosynovitis and systemic granulomatous diseases. The possible coexistence of granulomas and amorphous material in the histological sections may make diagnosis more difficult. Kostman et al. conducted a study on two cases with granulomatous tenosynovitis in terms of tophaceous deposits. They reported mimicked tuberculous dactylitis in one case due to swelling and limited motion of the finger. Finally, regarding negative mycobacterial cultures, the diagnosis of gout was confirmed [7]. Hence, swelling was observed, while the range of motion of the wrist, one of the main manifestations of tuberculous tenosynovitis, was not limited. Similarly, a change in the amount of antihypertensive medicine may have triggered the atypical gouty arthritis of the wrist. Untreated gout sufferers had a 19%-30% lifetime chance of developing wrist gout [9]. Based on recent studies, acute onset of polyarticular gouty arthritis is more frequent in older patients who are receiving diuretics for the management of hypertension [10,11].

The obtained results suggest that gouty tenosynovitis can mimic TB tenosynovitis. However, gout with the manifestations of granulomatous synovitis is very rare. Granulomatous synovitis is typically a chronic relapsing process, the infectious causes of which include tuberculous, and nontuberculous mycobacteria [12]. Although infection should be first considered and treated in a timely manner, it seems that the differential diagnosis of tuberculosis arthritis and sarcoidosis should be considered in the patients with gout since granulomatous is known as one of the symptoms

of these diseases [12], in particular, in the patients with a history of known gout or a history of treatment with diuretics. Moreover, infection and gout can coexist in tendons. Coexisting of infection and gout at the level of the digital flexor tendon was reported in one study [13]. Therefore, it should be included in the differential diagnosis list. Since the following therapy and potential surgical management of carpal tunnel syndrome are distinct, it is crucial for doctors to be aware of patients with this condition. Histopathological examination can identify the patients with granulomatous gouty tenosynovitis and help physicians initiate proper therapy. A holistic approach, and considering histopathology findings lead to timely remission and prevention of unnecessary interventions.

Conclusion

Tuberculous arthritis should be considered a differential diagnosis with gout with the manifestations of granulomatous synovitis in the patients with chronic monoarthritis. We suggest that tissue specimens be evaluated for crystals in cases suspected for granulomatous tenosynovitis, and arthritis in addition to mycobacterial and fungal cultures.

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Conflict of interest

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