


Spondyloarthritis: A Gouty Display

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ABSTRACT

Gout is a systemic, metabolic disease that typically affects the peripheral joints. We describe an unusual presentation of gout affecting the facet joints and costovertebral joints in the thoracic and lumbar spine. A 54-year old man presents to the emergency department with increasing swelling and pain at the left elbow for one week and difficulty ambulating. The imaging work-up included plain radiographs of the left elbow, left wrist, and chest with subsequent admission for possible septic arthritis. MRI of the elbow showed olecranon bursitis and an erosion of the lateral epicondyle. CT scan demonstrated lytic cloud-like lesions localized to the facet joints and costovertebral joints of the thoracic and lumbar spine as well as bilateral medullary nephrocalcinosis. Possible hyperparathyroidism manifestations (including Brown tumors and medullary nephrocalcinosis) were evaluated with plains films of the hands; x-rays instead showed classic gouty arthritis. Our report reviews the disease, epidemiology, classic radiologic findings, and treatment of gout.

CASE REPORT

CASE REPORT

A 54-year old Hispanic man with limited ambulation presented to the emergency department with generalized polyarthralgias and painful, progressive swelling of the left elbow for one week. The patient reported having a history of arthritis, gout, multiple foot and knee arthroscopies for chronic pain, and long standing use of NSAIDs. Patient denied recent upper respiratory tract infections, trauma, or fevers. The erythrocyte sedimentation rate (ESR) was high at 104 mm/hr (normal 0-20 mm/hr), C-reactive protein (CRP) was also high at 23.6mg/dL (normal 0-0.9 mg/dL), serum creatinine elevated at 1.5 mg/dL (normal 0.8-1.3 mg/dL), serum uric acid elevated at 7.7 mg/L (normal 3.5-7.2 mg/L), normal calcium level, and normal urine chemistry and analysis. MRI of the left elbow demonstrated olecranon bursitis with an erosion of the lateral humeral epicondyle complicating the clinical picture as possible abscess and osteomyelitis (Figure 1). For diagnostic clarity, the patient subsequently had an ultrasound-guided left

elbow aspiration that drained a thick, cheese-like paste collection that was negative for aerobic and anaerobic organisms on culture.

During the hospital stay, a non-contrast CT scan of the abdomen and pelvis was order for abdominal pain and fever. The CT scan demonstrated bilateral medullary nephrocalcinosis (Figure 2), lytic cloud-like mass lesions localized to the facet joints and costovertebral joints of the thoracic and lumbar spine (Figure 3), a pathologic rib fracture (Figure 4) as well as sacroiliac joint erosions (Figure 5). Differential diagnosis for the spine lesions and medullary nephrocalcinosis included hyperparathyroidism (with Brown tumors), renal tubular acidosis, and medullary sponge kidney. Radiographs of the knees (to evaluate the medial tibial metaphysis) and the hands (to evaluate the radial aspect of the 2nd and 3rd proximal phalanx) were recommended to rule out hyperparathyroidism. The plain films however showed classic, severe tophaceous gout (e.g. periarticular erosions with sharp

sclerotic margins, overhanging bony edges near joints, and peri-articular soft tissue/tophaceous masses) (Figures 6 & 7). The lytic lesions displayed throughout the spine were therefore an unusual manifestation of spondyloarthritis secondary to chronic tophaceous gout (Figure 8).

The patient was treated with colchicine for the gouty attack, discharged with allopurinol for gout management, and granted a request for a wheelchair at home to accommodate his gouty spondyloarthritis.

DISCUSSION

Gout is a metabolic disease of monosodium urate (MSU) crystal deposition affecting primarily middle-aged to elderly men and postmenopausal women (1). The peak age incidence occurs at 30-50 years of age and affecting approximately 2.1 million people (2). There are four phases of gout: (1) asymptomatic hyperuricemia, (2) acute gouty arthritis, (3) intercritical gout, and (4) chronic tophaceous gout (4). In acute gouty arthritis, the first episode commonly occurs at night with dramatic joint pain and swelling and classically presents at the metatarsophalangeal joint of the first toe (clinically known as podagra). Ultrasound-guided aspiration of the synovial fluid in the inflamed joint may reveal needle-shaped urate crystals that are negatively birefringent under a polarized microscope (4).

Chronic tophaceous gout occurs in patients who have had poorly controlled gout for a prolonged period of time, ranging from three to forty-two years with a mean of about 12 years (3). Tophaceous gout occurs in less than 10% of gout patients (2). Tophi are urate crystal aggregates from inflammatory reactions and generally lead to deformity of hard or soft tissues. They often lead to destruction of non-axial bony structures, cartilage, and/or adjacent joints, thus a peripherally degenerative arthritic disease. It is important to note that chronic gouty arthritis can present with a chronic nonsymmetric synovitis, which may be confused with rheumatoid arthritis (1). As the disease progresses, there is increased risk of MSU crystals depositing in kidney interstitium and potentially leading to nephrolithiasis in severe cases (1).

Chronic changes seen on plain radiographic imaging usually reveal periarticular erosions with sharp sclerotic margins, overhanging bony edges near joints, and/or tophaceous masses that are better appreciated with CT correlation (5). Additionally, the plain films reveal joint spaces that are preserved at the initial stage of the disease, normal bone density, and soft tissue lesions that may be hyperdense from crystal deposition. CT imaging as well as MRI can show the calcific deposits that are present in only fifty percent of tophaceous gout (6). As a systemic disease, untreated gout in some cases may lead to tophi deposition in variable locations, including intra-abdominal masses, intra-atrial cardiac masses, and in this patient, destructive lesions localized to facet joints of the lumbar spine and sacroiliac (SI) joints. The incidence of SI joint involvement in chronic gout ranges from 7% to

17%, based on radiographic findings, and usually presents asymmetrically (6). Of the 69 case reports on axial gout, chronic tophaceous gout was seen in 32 patients with only 6 involving the sacroiliac joints (7). However, the predilection of this disease process is non-axial such as joints of the feet, knees, and hands, the cartilages of the ear, around the olecranon bursa, and the nose (2).

Using the patient's history (e.g. gouty attacks, severe pain, family history), the finding from physical examination (e.g. erythematous, warm, swollen joints), the laboratory findings of fluid from an ultrasound-guided aspiration (e.g. elevated uric acid, needle-shaped, negatively birefringent crystals), and radiologic features found on plain radiographs, CT, or MRI (e.g. sharp margins, sometimes sclerotic bordered erosions with overhanging edges near joint, soft tissue nodules/tophus formation, usually no evident osteoporosis, and maybe joint deformity depending on chronicity) are all helpful in making the proper diagnosis of spondyloarthritis secondary to chronic tophaceous gout. The differential diagnoses include hyperparathyroidism, septic arthritis, reactive arthritis, cellulitis, and osteomyelitis. It is important to note that in hyperparathyroidism there are its own typical radiographic findings in the hands (i.e. subperiosteal resorption of the radial aspect of the second and third proximal phalanges) and proximal medial tibial metaphysis which show similar resorption. Treatment of acute gouty attacks is typically with NSAIDs or colchicine and pharmaceutical management of chronic disease is with xanthine oxidase inhibitors (e.g. allopurinol, uric) and/or uricosuric agents (e.g. probenecid).

TEACHING POINT

While gout is a systemic disease that typically manifests in peripheral joints (e.g. feet, knees, hands), there can be unusual axial presentations associated with chronic gout. Thus, knowledge of classic radiologic findings (e.g. sharp margins, sclerotic bordered erosions with overhanging edges near joint, soft tissue mass/tophus) within a clinical workup can help to narrow the final diagnosis.

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FIGURES



Figure 1: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. Multiplanar, multisequence imaging of the left elbow with and without gadolinium contrast (13 cc dosage; Siemens MRI 1.5 Tesla magnet). T2 weighted sagittal STIR image (TR 5380, TE 44) shows the olecranon bursitis (A) and a T1 weighted axial image (TR 648, TE 13) shows the erosion of the lateral humeral epicondyle (B).



Figure 2 (left): 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. CT without contrast (Siemens Sensation 16 CT scan with 98 eff. mAs, 140 kVp, and 5.0 slice thickness). The axial noncontrast CT scan of the abdomen and pelvis reveals bilateral medullary nephrocalcinosis (white arrows).

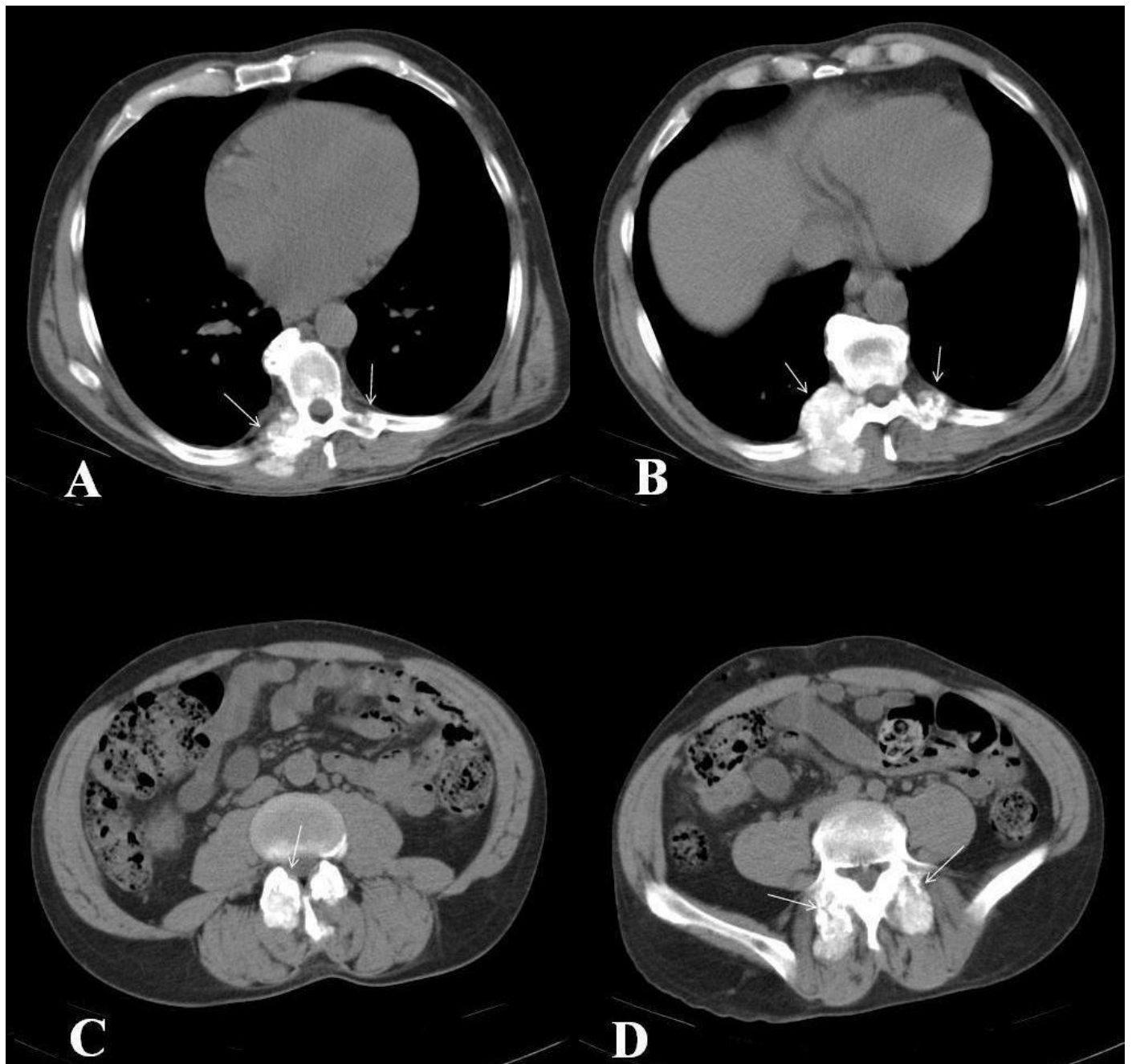


Figure 3: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. CT without contrast (Siemens Sensation 16 CT scan with 98 eff. mAs, 140 kVp, and 5.0 slice thickness). A(level of T8),B(level of T9),C(level of L4), D (level of L5): The axial noncontrast CT scan of the abdomen and pelvis reveals expansile cloud-like lesions which are lytic and involving the posterior elements bilaterally, right greater than left. Lesions localized to the facet joints and costovertebral joints of the thoracic and lumbar spine (white arrows). Lesions are secondary to tophaceous gout.



Figure 4: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. CT without contrast (Siemens Sensation 16 CT scan with 98 eff. mAs, 140 kVp, and 5.0 slice thickness). The axial noncontrast CT scan of the abdomen and pelvis reveals a pathologic fracture of the right posterior 10th rib with an associated soft tissue mass (black arrow).

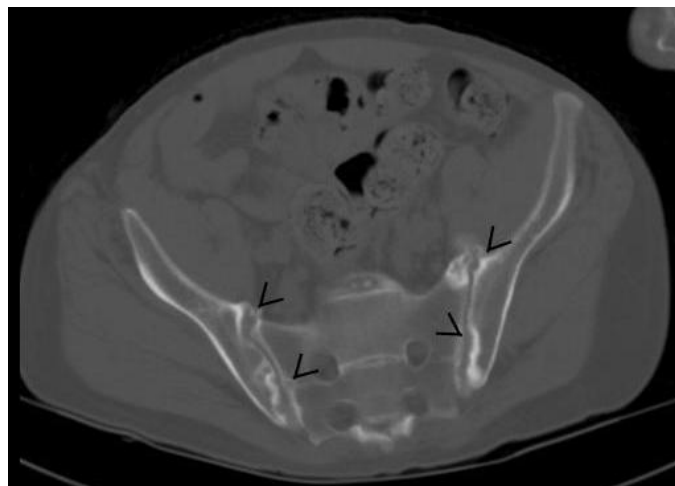


Figure 5: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. CT without contrast (Siemens Sensation 16 CT scan with 98 eff. mAs, 140 kVp, and 5.0 slice thickness). The axial noncontrast CT scan of the abdomen and pelvis reveals an erosive pattern (black arrowhead) of bone abnormality involving the sacroiliac joints bilaterally, which is compatible with the patient's disease.



Figure 6: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. Plain radiographs of the left hand (6a) and right hand (6b) reveal periarticular erosions (black arrows), overhanging edges near joints (white arrowhead), and normal bone density.

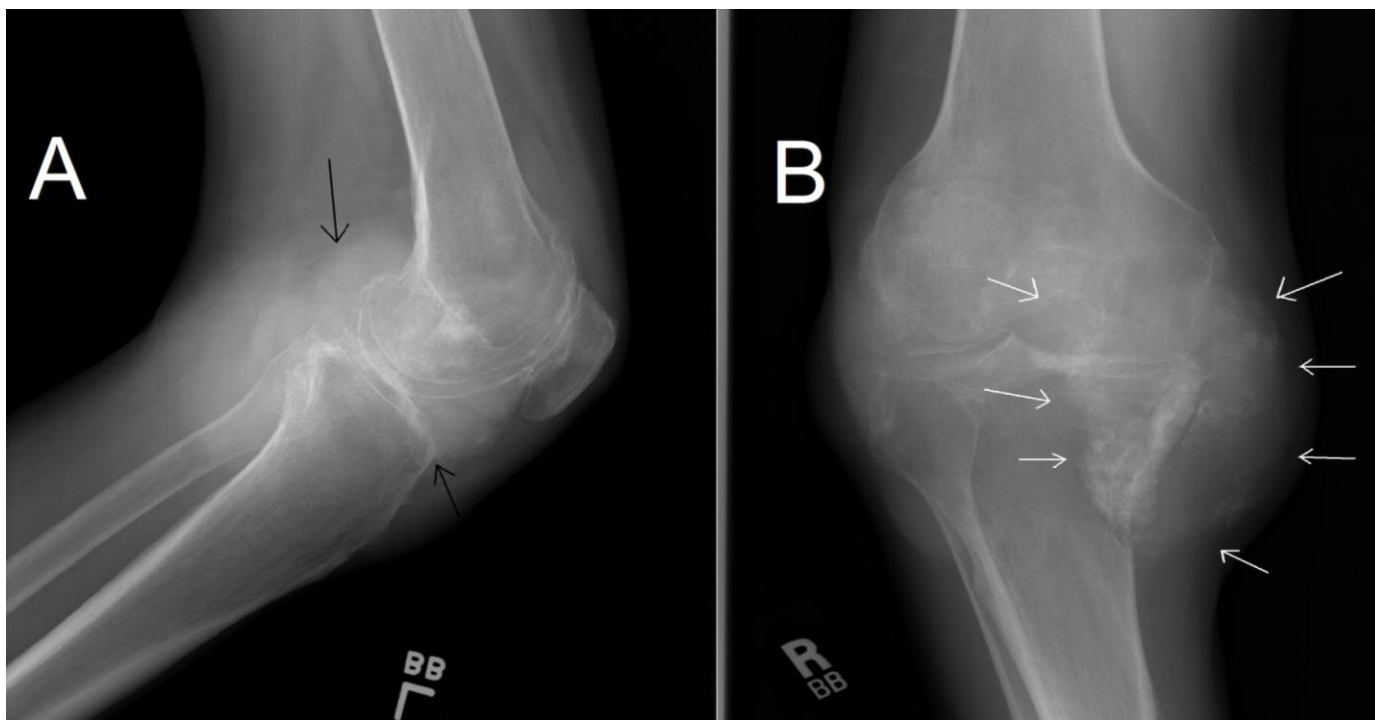


Figure 7: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. Plain radiographs reveal periarticular erosions with severe loss of joints spaces and tophaceous deposition of the left knee (7a, black arrows) and right knee (7b, white arrows), normal bone density, and no evidence of subperiosteal bone resorption along the medial tibial metaphysis.

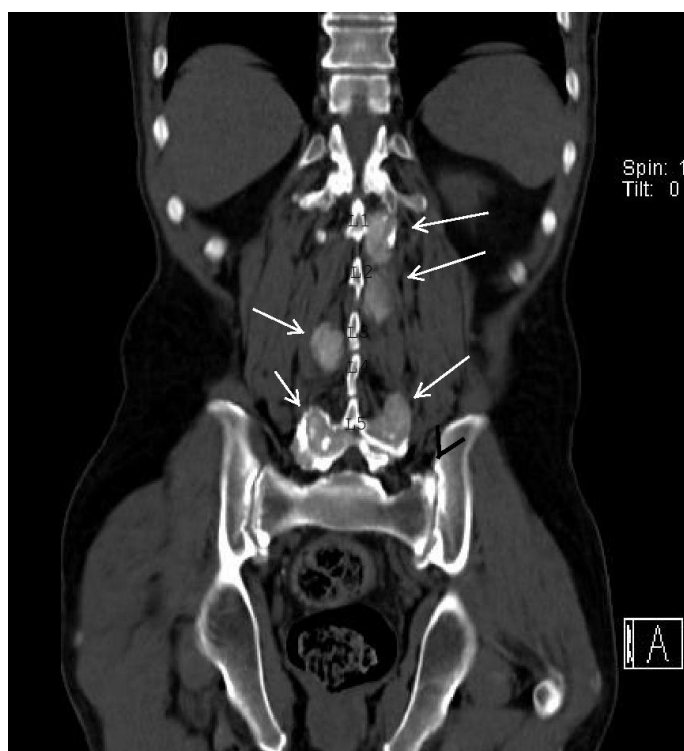


Figure 8: 54 year old man with spondyloarthritis secondary to chronic tophaceous gout. CT without contrast (Siemens Sensation 16 CT scan with 98 eff. mAs, 140 kVp, and 5.0 slice thickness). The axial noncontrast CT scan of the abdomen and pelvis reveals multiple cloud-like lesions in the lumbar region (white arrows) as well as the erosive pattern (black arrowhead) of the sacroiliac joints.

ABBREVIATIONS

- CT = Computed Tomography
- MRI = Magnetic Resonance Imaging
- MSU = Monosodium Urate
- NSAID = Non-Steroidal Anti-Inflammatory Drug
- STIR = Short Tau Inversion Recovery

KEYWORDS

Chronic Tophaceous Gout, Spondyloarthritis, Gout

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