

# Chronic Tophaceous Gout in Multiple Spines: A Case Report and Literature Review

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Gout typically affects the 1st metatarsophalangeal joint. Spinal gout is rarely reported. Moreover, involvement of extensive spines is remarkably unusual. We describe a case of a 76-year-old woman with gout involving cervical, thoracic, and lumbar spines and sacroiliac joint. She presented with fever, severe back pain, and polyarthralgia and had multiple tophi on both elbows and the left 2nd and 5th proximal interphalangeal (PIP) joints. Monosodium urate crystals were confirmed from tophi on the left 5th PIP joint by polarized optical microscopy. Magnetic resonance imaging and computed tomography showed joint space narrowing and bony erosions on cervical, thoracic, and lumbar spines, and sacroiliac joint. Fever, back pain, and polyarthralgia improved significantly with oral steroid therapy. Spinal gout can involve multiple spines and other joints and it can be improved by medical treatment only. It should be considered in patients with uncontrolled gout who have acute severe back pain. (*J Rheum Dis* 2015;22:250-255)

**Key Words.** Axial, Gout, Multiple, Spine

## INTRODUCTION

Gout is a common inflammatory arthritis caused by deposition of monosodium urate (MSU) crystals within joints following chronic hyperuricemia. It is often associated with metabolic syndrome and renal insufficiency [1,2]. The frequency of gout is much higher in men than in women and increases with age [1-3]. In women, gout usually occurs after menopause as the estrogen level decreases and the uric acid level rises in the blood [1,3].

Acute gout commonly begins with monoarthritis in the lower limbs. In particular, 1st metatarsophalangeal (MTP) joint is involved in about 50% of patients with their onset [1]. When untreated acute gout and hyperuricemia are left, chronic gout with tophi can develop within several years. It is characterized by destruction of multiple joints with persistent inflammation. In chronic gout, any peripheral joints, including the upper limbs as well as the lower limbs, can be involved [1].

Gout typically affects the peripheral joints, but the involvement of axial joints has been rarely reported and they usually were found in lumbar spines [4-6]. In previous reports, there were only 4 cases of the patients with chronic tophaceous gout involving axial joints in Korea and all of the patients were a man [7-10]. We report a case of a 76-year-old woman with gout that affected extensive spines including cervical, thoracic, and lumbar spines and sacroiliac joints.

## CASE REPORT

A 76-year-old Korean-Chinese female was admitted because of severe back pain and aggravated polyarthralgia from 3 days ago. She had a history of hypertension and chronic kidney disease for 20 and 4 years, respectively. She had received a calcium channel blocker for hypertension. Fourteen years ago, she had an abrupt swelling and severe pain on her left foot and was diagnosed with

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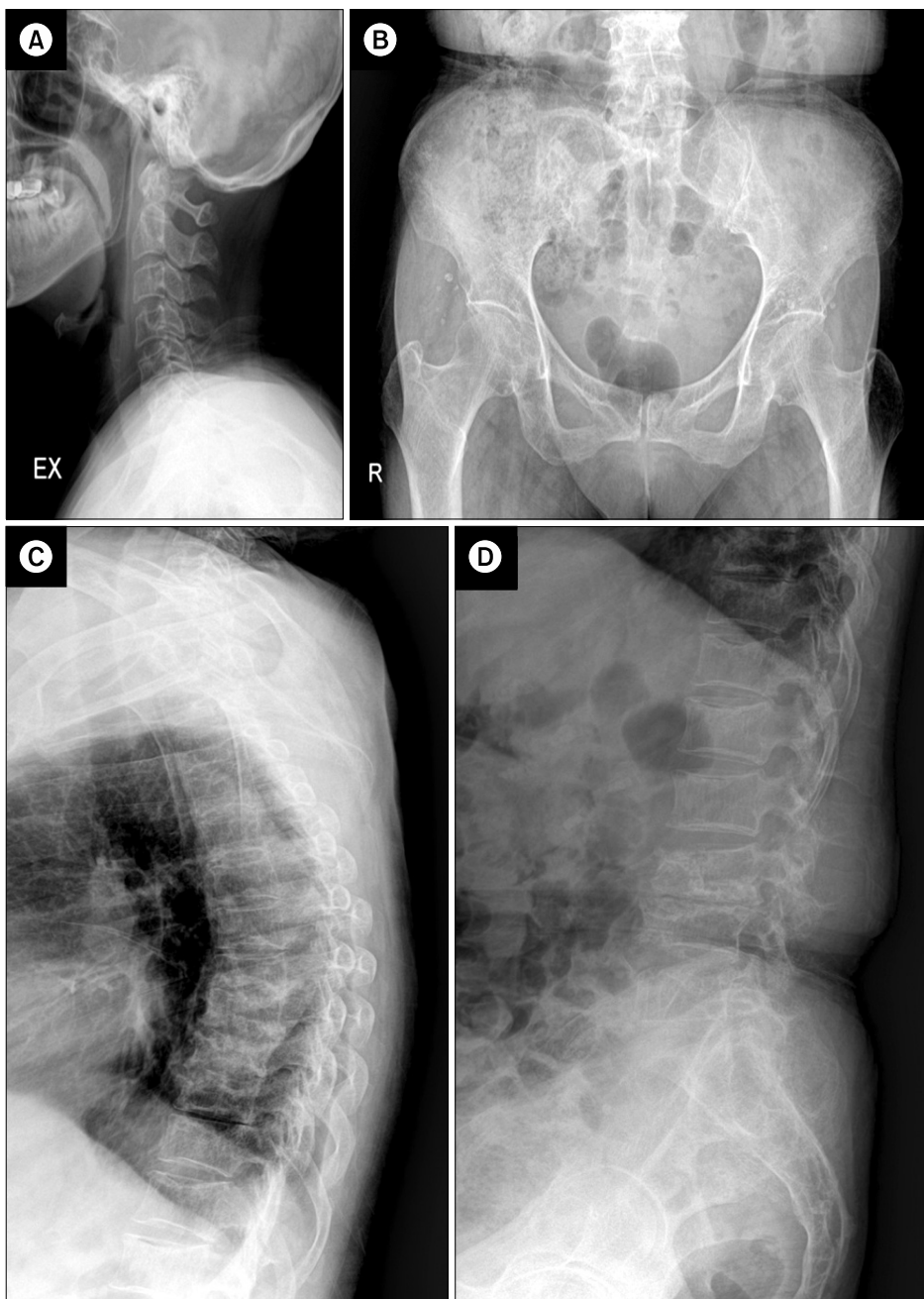
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acute gout in the health clinic. After that, intermittent gouty attacks developed many times in the variable joints of her lower and upper limbs. However, she treated them only with several medicines not checkable whenever she had gouty attacks without hypouricemic treatment. One year ago, she had difficulty in walking from severe back pain and she heard that she had spinal stenosis. Her back pain was developed after movements that involve lifting, twisting or forward-bending in thoracic and lumbar spines without radiating pain and was not well-controlled with variable analgesics such as acetaminophen and

tramadol.

At admission, she had a mild fever of 37.8°C with a normal range of blood pressure and pulse. Moon face and buffalo hump were observed. In the joint examination, swelling and tenderness were revealed on multiple joints including both elbows, wrists, the 2nd and 5th proximal interphalangeal (PIP) joints, left ankle, and the left 1st and 5th MTP joints and tenderness on her cervical, thoracic and lumbar spines. There were observed the palpable multiple tophi on her both elbows and the left 2nd and 5th PIP joints.



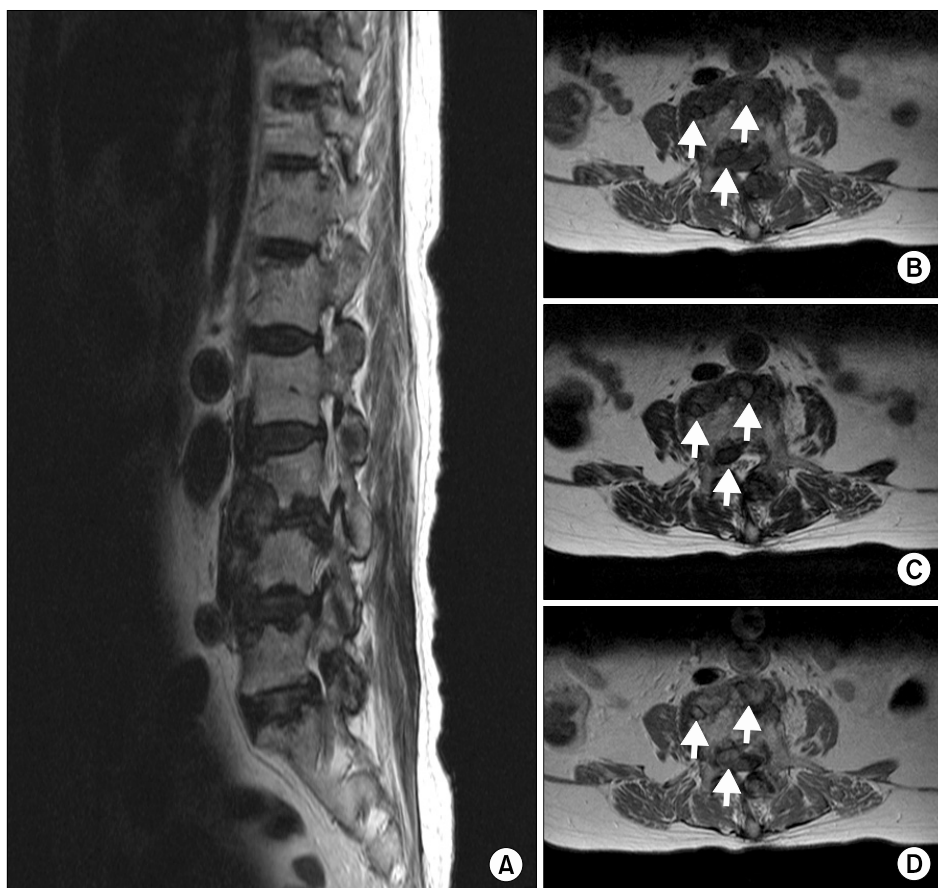
**Figure 1.** Plain radiography. Joint space narrowing with small erosion at atlantoaxial joint is observed (A) and the subtle irregular shaped bony erosions in both sacroiliac joint are shown (right > left) (B). Disc space narrowing with sclerotic margined bony erosions are shown in the subchondral bone of from 6th to 11th thoracic vertebrae, from 2nd to 5th lumbar vertebrae and in the upper endplate of from 12th thoracic and the first lumbar vertebrae (C, D).

Complete blood count was as follows; hemoglobin 8.8 g/dL, white blood cell 11,850/mm<sup>3</sup> (neutrophil 75.3%) and platelet 254,000/mm<sup>3</sup>. Blood urea nitrogen and creatinine increased to 43.7 mg/dL and 2.0 mg/dL, respectively. Erythrocyte sediment rate (ESR) and C-reactive protein were markedly elevated to 100 mm/h (normal

range, 0 to 20 mm/h) and 31.51 mg/dL (0 to 0.5 mg/dL). Serum uric acid also increased to 10.0 mg/dL (2.5 to 8.3 mg/dL). Liver function test was within normal range. Urinalysis revealed a proteinuria 1+. MSU crystal was found under polarized light from a tophus around the left 5th PIP joint.



**Figure 2.** Chest computed tomography. The axial view of T10 vertebrae (A) and the sagittal view of from T7 to T11 vertebrae (B) show the endplate bony erosions and disc space narrowing.



**Figure 3.** Lumbar magnetic resonance imaging. Multiple well-defined bony erosions adjacent the disc space from 2nd to 5th lumbar vertebrae are revealed on T2-weighted image (A). T1-weighted image (B) and T2-weighted image (C) show well-defined bony erosions and extraosseous extension (arrows) and low signal intensity at 3rd and 4th lumbar vertebrae. In the contrast-enhanced T1-weighted image, these lesions are diffusely enhanced (D).

The plain radiograph of spines showed disc space narrowing with sclerotic margined bony erosions in the subchondral bone of multiple thoracic and lumbar spines (Figure 1). There were also observed the subtle irregular shaped bony erosions and joint space narrowing in sacroiliac joints (Figure 1). Additionally, the radiograph of both hands and feet showed overhanging erosions in both wrists, metatarsal base and MTP joints and soft tissue swelling in both PIP and MTP joints. Chest computed tomography (CT) showed the endplate bony erosions of vertebral bodies, and facet joint and disc space narrowing in the multiple thoracic vertebrae and subtle bony erosions at sternomanubrium joint (Figure 2). In the lumbar magnetic resonance imaging (MRI), multiple bony erosions of vertebral bodies adjacent to disc space and the erosions in 3rd and 4th lumbar vertebrae with low signal intensity on T1 and T2 weighted images were diffusely enhanced on the contrast-enhanced T1 weighted image (Figure 3).

She was diagnosed with the flare of chronic tophaceous gout that involved multiple spines and sacroiliac joints as well as peripheral joints. She was treated with prednisolone 40 mg everyday, and fever was subsided and her back pain and polyarthralgia improved gradually. Prednisolone was tapered from the 5th day of treatment and she was discharged with prednisolone 7.5 mg/d. Serum uric acid level was definitely decreased to 8.1 mg/dL at discharge. The acute gout did not recur for 2 months with prednisolone 7.5 mg/d and she went back to China before starting an urate-lowering therapy.

## DISCUSSION

Acute gout present typically in the 1st MTP (podagra), ankle, knee joints and tarsal bone and can progress to multiple peripheral joints in the chronic gout [1-3]. The involvement of spines and sacroiliac joint has been known to be rare in gout and it was first described by Kersley et al. [11]. Spinal gout was usually reported in men with chronic tophaceous gout in consequence of longstanding, poorly controlled gout. They usually had radiographic erosions or tophi in the hands or feet [2,5,6,12]. In our case, she was an also uncontrolled patient of chronic tophaceous gout diagnosed 14 years ago and had radiographic changes and tophi in both hands and feet.

Spinal gout could be involved in any level of spines but predominantly the 4th and 5th lumbar spines and most of

them were involved more than one vertebrae [2,4-6]. In previous reports, there were only 4 cases of the patients with spinal gout in Korea. Yoon et al. [7] reported a case of a 64-year-old man with a history of gouty arthritis of the knee and presented with thoracic myelopathy and radiculopathy. Imaging of the spine revealed an extradural mass lesion with bony erosion of the thoracic spine, especially 5th to 7th thoracic vertebrae. Spinal gout was confirmed a gouty tophus after a decompressive operation. Suk et al. [8] reported a case of a 55-year-old-male patient with acute lower back pain and radiculopathy with high spiking fever indicated pyogenic discitis. However, spinal gout of 4th to 5th lumbar vertebrae level was confirmed by histopathologic examination after surgical removal of lumbar disc. Bang et al. [9] reported the case of a 36-year-old-male patient with low back and right buttock pain. They diagnosed spinal gout of right 5th lumbar to 1st sacral facet joint, bone and soft tissue from imaging study such as CT or MRI. Extensive spinal involvement of gout was also reported in a 52-year-old-male with chronic tophaceous gout. In this case, the gout involved his cervical, thoracic and lumbar spines and caused cervical spinal cord compression resulting in paraplegia and sensory loss [10]. All of the patients of spinal gout in Korea were a man. However, our case is the first report of a woman in Korea who had an untreated gout and involved whole spines.

The manifestations of spinal gout are various including asymptomatic cases, back pain, and neurological symptoms from mild radiculopathy to paraplegia [2,4-6,13]. Back pain with neurological symptoms such as radiculopathy was reported as the most common symptom of spinal gout and the other symptoms including claudication, paraparesis, quadriplegia and paraplegia were reported in some patients. Back pain is very frequent symptom that can develop by various causes such as spinal abscess, spinal tumor, vertebral discitis, and spinal stenosis and so on. In the patient with gout, it should be considered with spinal gout besides these common causes of back pain, and especially, when it is accompanied with fever, leukocytosis, and elevated ESR, both gout flare and infection should be considered [2,6].

For the diagnosis of gout, radiologic findings of X-ray, ultrasonography, CT, and MRI may be helpful in case that is not possible to confirm MSU crystal in tissue such as spines. Most of reported cases were diagnosed as spinal gout without aspiration or biopsy of spine. Typical radiographic findings of chronic tophaceous gout include

para-articular punched out bony erosions with overhanging edges and a thin sclerotic margin because of tophus infiltration into bone [1]. The joint space is very well preserved until late in the course of disease [1]. On ultrasonography, the tophi appeared as hypoechogenic structures of high attenuation with shadowing and hyperechogenic surrounding, which cannot be clearly differentiated from rheumatoid nodules and they are unlikely to be useful for axial gout [6,14]. CT can show intra-articular and juxta-articular erosions with sclerotic margins and greater attenuation density than the surrounding muscle due to MSU deposits [6]. In MRI, tophi can be appeared as a homogeneous image with from intermediate to low signal on T1 weighted image, and a homogeneous or heterogeneous image with from low to high intensity on T2 weighted, variously. In the enhanced image by gadolinium, peripheral heterogeneous or homogeneous contrast enhancement may occur with reactive vascularization [13]. In recent studies, dual-energy CT has been reported as a clinically relevant modality for the diagnosis of gout by differentiating urate crystals from calcium. It may be helpful to diagnose gout when it involves at a place where hard to obtain joint fluid, such as spines [15].

In our case, the radiography and CT showed bony erosions with sclerotic margins in multiple spines and sacroiliac joint. MRI showed the bony erosions were low signal intensity on both T1 and T2 images, and diffusely enhanced by gadolinium. These findings were compatible with previous reported cases of spinal gout. Thus we could diagnose spinal gout by radiologic findings with confirmed MSU in tophi of peripheral joint although MSU in spines was not identified.

Spinal gout may initially be treated with colchicines, non-steroidal anti-inflammatory, and in cases of necessity, intravenous or epidural corticosteroid, as like in acute gout [1,2,6,13]. In the patients without neurological symptom, the early diagnosis with the medical treatments can lead to improve symptoms, but in patients with neurological symptom, they may not be controlled by only medical treatments [6,13]. When the symptoms persist or recur after initial improvement, surgical treatment may be needed [1,6,13].

## SUMMARY

In our case, a 76-year-old gout patient who has severe back pain and polyarthralgia with fever, leukocytosis, and elevated ESR was diagnosed with the extensive involve-

ment of gout in spines and the sacroiliac joint by radiography, CT, and MRI with identification of MSU from tophi on her PIP joint and improved with steroid therapy.

In conclusion, spinal gout is often overlooked due to the lack of awareness by physicians and radiologists, but it should be considered in patients with back pain and longstanding, poorly controlled gouty arthritis and it may be improved with the definite diagnosis and medical treatments.

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## CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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