

# Gouty Tophi in Spine Causing Complete Lower Limb Paralysis: A Rare Presentation of Gout

Marazuki Perwira<sup>1</sup>, Dzulkarnain Amir<sup>2</sup>, Nur Azlin Zainal Abidin<sup>3</sup>, Fazir Mohamad<sup>4</sup>

Department of Orthopaedic & Traumatology, Kuala Lumpur General Hospital, Kuala Lumpur, Malaysia

**Abstract:** *Introduction:* Gout is a common inflammatory arthritis affecting people worldwide, causing recurrent acute painful arthritis. A tophi, which is a painless swelling is one of the commonest consequences in long standing gouty arthritis patient. Typically, it is found on the hand, feet and pinna of the ears. *Case Report:* We report a rare presentation of gout in a previously healthy young man, who came with complete lower limb paralysis due to spinal cord compression by gouty tophi. He underwent surgical decompression procedure with good initial motor and sensory recovery, but deteriorate after developed other complications.

**Keywords:** spinal gout, complete paralysis, gouty tophi

## 1. Introduction

Gout is a disease caused by deposition of monosodium urate crystals within joints and periarticular tissues. Tophi, which are large localized deposits of urate, develop in patients who have longstanding gout or large total body urate loads. The tophaceous material can develop adjacent to any joint in the body, and cause erosion to osseous structures, bursae or skin. Spinal involvement of the gouty tophi has been described in the literature, but it is uncommon. A case with complete paralysis secondary to spinal gout is even rare.

Spinal gout is difficult to diagnose and has been shown to be under, or misdiagnosed due to its presentation which can mimic a varied clinical picture. Patients with gouty spinal involvement may present in a variety of symptoms, including chronic back pain, sacroiliac joint involvement, concurrent fever, quadriplegia, myelopathy and radiculopathy<sup>1</sup>. This case report illustrates how the diagnosis of gouty tophi affecting the spine should be considered especially in patients who present with back pain but have risk factors for developing uric acid arthropathy despite having no previous history of gout or hyperuricaemia.

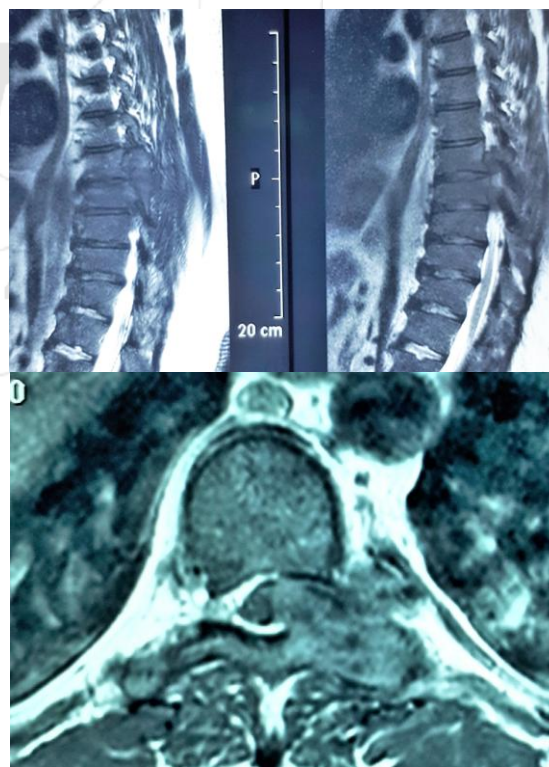
## 2. Case Report

A thirty-year-old gentleman, morbidly obese with Body Mass Index of 46 but no other known medical illness, was admitted with acute onset of complete paraplegia of bilateral lower limb. The patient had a history of one year of recurrent back pain, and gradual worsening bilateral lower limb weakness, two months prior the admission. Otherwise, he denied any history of fever, constitutional symptoms or any tuberculosis contact.

On examination, patient had complete neurological deficit with bilateral lower limb muscle power Grade 0/5 and absent sensation from level T7 dermatome downwards. Per rectal digital examination revealed lax anal tone and absence of bulbocavernosus reflex. Blood investigations taken were insignificant with a normal white blood cell count and erythrocyte sedimentation rate of 2mm/hr. Plain radiograph of thoracic spine did not show any evidence of bony destruction or disc space narrowing. Plain chest radiographs showed clear lung fields. Magnetic Resonance Imaging

(MRI) of the whole spine reported left posterior element expansile bony lesion at T7 and T8 vertebrae. The lesion causing compression of the cord and was encasing the left T7 exiting nerve root (Picture 1).

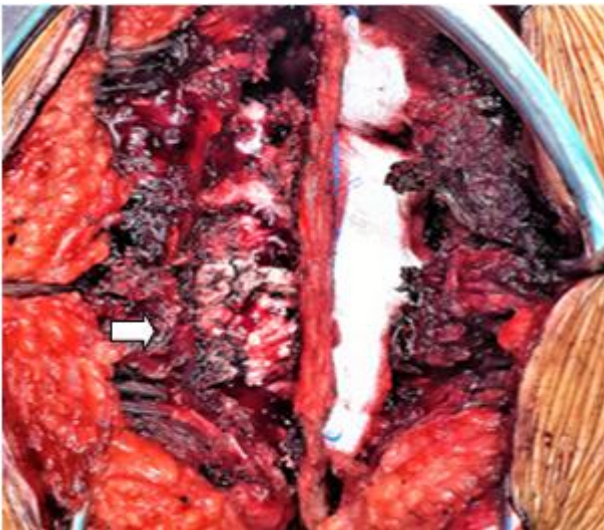
In light of the MRI findings and acute neurological deficit, the patient underwent posterior spinal instrumentation and fusion of T5 to T9 with laminectomy of T7 and T8. Intraoperatively, white chalky material was removed from the left transverse process and lamina of T7 (Picture 2). The lesion extended into the spinal canal causing spinal cord compression and also extending to the T8 vertebrae, with left sided T7 nerve root encased in this white chalky material (Picture 3). The facet joints at T7/T8 was also destructed.



**Picture 1:** MRI T2 weighted image of axial and sagittal view showed an expansile bony lesion involving the left transverse process, lamina and pedicle of T7 vertebrae, which extend into spinal canal and compressing the spinal cord.

Histopathological examination of the bone and white chalky material samples were consistent with gouty tophi. Post operatively, uric acid levels were measured at 602  $\mu\text{mol/l}$ . On further history, he admitted that his uncle also had suffered from gouty arthritis and complicated with multiple gouty tophi on his extremities.

The patient has marked improvement as his lower limb muscle power improves to grade 3/5 post operatively. Unfortunately, the patient's condition was complicated by massive pulmonary embolism and acute renal failure. His lower limb function deteriorated again after he developed massive bleeding while on anticoagulant. Further intervention failed to improve his condition and he succumbed to septicaemia due to pressure sore after a prolonged stay in the intensive care unit.



**Picture 2:** Intraoperative image showing chalky white material over the lamina of T7 and T8 vertebrae (arrow)



**Picture 3:** Intraoperative image showing chalky white material within the spinal canal, compressing on the spinal cord and encasing T7 exiting nerve root (arrow)

### 3. Discussion

Joint pain is the most common presentation of gouty arthritis and 1<sup>st</sup> metatarsophalangeal joint pain is considered as classical presentation of the disease. Even though it can be

treated as outpatient basis, joint pain is still the commonest cause of hospitalization for gout patient. A local study by Teh et al showed 21.7% of gouty arthritis patients admitted due to acute painful gout attack. Other major causes of admission are due to complication of gout or its treatment such as gastrointestinal bleeding (18.5%), kidney stones (14.1%) and others. Their study also stated that gouty tophi is the most common complication of long-standing gouty arthritis (47.1%)<sup>2</sup>.

The tophi are typically grown at synovial tissue. Ankle, 1<sup>st</sup> metatarsophalangeal joint, hand and elbow are the area where the tophi usually can be found. Even though it is painless, it still can cause a lot of problems. A big tophus at foot will cause difficulty in putting the foot in a shoe. A tophi at the joint of the hand may cause limited function and stiffness. A tophaceous gout causing carpal tunnel syndrome also has been described in the literature<sup>3</sup>, but it is relatively uncommon. Spinal involvement is another rare complication of gouty arthritis.

There are actually quite a number of cases has been reported in the literature. However, the condition remains notoriously difficult to diagnose. Majority of spinal gout was diagnosed intraoperatively with the findings of white chalky material. We encountered the same problem in reaching the initial diagnosis. Unlike most of the cases which has been published<sup>1</sup>, our patient didn't have any previous illness, still considerably young and no visible superficial tophi on his limbs. Obesity and strong family history are two main risk factors for our patient to develop the illness.

Bony changes on may take several years before they can be observed on plain radiograph, which may eventually show para-articular "punched-out" bony erosions with thin, sclerotic margins. Adjacent periosteal new bone formation, and in some cases bony ankylosis might be seen. In our patient, the plain radiograph of his whole spine was insignificant. MRI may show non-specific features of the spinal lesions and it can be difficult to identify these lesions as tophaceous material, with only 21% of cases of MRI reported unequivocally as spinal gout<sup>4</sup>. Computed Tomography (CT) scan have been useful to help show joint erosions with sclerotic margins, facet and intervertebral neof ormation or areas in the juxta- or intra- articular masses that are denser than the surrounding muscles<sup>5</sup>. However, these findings can be confused for tumour or abscess. CT scan was not done for this patient as he was pushed for emergency surgery due to acute neurological deficit.

Spinal tophaceous material is more likely to be found depositing on both sides of the vertebrae at the facet joints, pedicle and intervertebral foramen, and although it can affect any part of the axial skeleton, it is most commonly reported to occur in the lumbar spine region<sup>6</sup>. The tophaceous material may cause erosion of the affected anatomical parts of the vertebrae and even encase and adhere to the dura mater, as demonstrated in our case. Most of the time, if the symptoms are caused by the compression of the spinal cord or the exiting root by the tophi, surgical decompression is indicated and post-operative result has been encouraging.



To our knowledge, there are only two published case, in which the patient presented with complete paraplegia of the extremity. In 1953, Koskoff and his colleagues described a 44-year-old man, presented with two months history of lower limb complete paraplegia secondary to gouty tophi at level of T11 vertebrae<sup>7</sup>. Another case has been presented by Popovich and his co-workers in 2006. They described a 36-year-old woman with two weeks history of absence motor and sensory function of her lower limb. The gouty tophi were compressing her spinal cord at T5 till T7 vertebrae level<sup>8</sup>. Both patients underwent surgical decompression procedure and both showed tremendously good motor and sensory recovery. We were able to achieved initial good result with improvement of his lower limb muscle power. Unfortunately, he developed multiple other complication related to his obesity and prolong bed ridden, in which he succumbs to death.



**Dzulkarnain Amir, MD.** Consultant & Head of Spine Unit, Department of Orthopaedic & Traumatology, Kuala Lumpur General Hospital



**Nur Azlin Zainal Abidin, MBBS.** Consultant & Head of Spine Unit, Department of Orthopaedic & Traumatology, Sungai Buloh Hospital, Selangor.



**Fazir Mohamad, MD.** Consultant & Head of Department, Department of Orthopaedic & Traumatology, Kuala Lumpur General Hospital

#### 4. Conclusion

Spinal gout can mimic various spinal conditions clinically, and remains a difficult condition to diagnose. However, in patients with risk factors for gout with chronic back pain with or without neurological symptoms, and positive clinical and radiological findings, then a differential for spinal gout should be considered. Surgical intervention is indicated in the presence of compression to the spinal cord or spinal root, and the result is considerably good.

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#### Author Profile



**Marazuki Perwira, MD.** Orthopaedic & Spine Surgeon, Department of Orthopaedic & Traumatology, Kuala Lumpur General Hospital