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Case Report

Tophaceous gout in thoracic spine mimicking meningioma: A case report and literature review

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ABSTRACT

Background: Gout is a common metabolic disorder of purine metabolism, causing arthritis in the distal joints of the appendicular skeleton. Spine involvement is rare, and very few cases of spinal gout have been reported. The authors present a rare case of axial gout with tophaceous deposits in the thoracic spinal canal resulting in cord compression and mimicking a meningioma.

Case Description: A 33-year-old male presented with chronic mid back pain and a progressive paraparesis. The presumed diagnosis was meningioma based on MR imaging with/without contrast that showed a posterolateral, right-sided, and T10-T11 intradural extramedullary lesion. Notable, was hyperuricemia found on hematological studies. The patient underwent a decompressive laminectomy (T9-T11) for excision of the lesion, intraoperatively, an intraspinal, chalky, white mass firmly adherent to and compressing the dural sac was removed. The histopathology confirmed the diagnosis of a gouty tophus. Postoperatively, the patient's pain resolved, and he regained the ability to walk.

Conclusion: A gouty tophus should be included among the differential diagnostic considerations when patients with known hyperuricemia present with back pain, and paraparesis attributed to an MR documented compressive spinal lesion.

Keywords: Axial gout, Meningioma, Spinal gout, Thoracic spinal gout, Tophaceous gout

INTRODUCTION

Gout is a common and complex form of arthritis characterized by classic signs of inflammation (i.e., dolor [pain], rubor [redness], calor [heat], and tumor [swelling] in the joint). Spinal involvement is rare, and very few cases of spinal gout have been reported in the literature.[10] Spinal tophi are easily misdiagnosed and are often asymptomatic or go unnoticed.[7]

Here, we present here a case in which tophaceous deposits in the thoracic spinal canal mimicked a meningioma. We will also review the 25 similar cases of thoracic spinal gout reported in the literature.

CASE REPORT

Clinical presentation

A 33-year-old male presented with 9 months of back pain and 5 months of a progressive paraparesis that markedly worsened within the 5 days before admission. On examination, he

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had a paraparesis (right side [3/5] and left-sided [4/5]), accompanied by hyperactive lower extremity reflexes (e.g., including Babinski responses), and paraesthesia below the umbilicus.

Laboratory investigation and imaging

The patient's total leucocyte cell count was increased to 22,290/mm^3, the serum creatinine was high at 1.82 mg/dL, and the serum uric acid level was elevated to 11.4mg/dL. Notably, urine routine microscopy was normal and showed no "gouty" crystals.

Diagnostic studies

Although the thoracic x-rays were normal, the MR showed a posterolateral right-sided lesion at the T10-T11 level. The vertebral/intracanalicular lesion was iso- to hypointense on T1W images and heterogeneous/low signal intensity on T2W images; it was also accompanied by a focal hyperintense cord signal [Figure 1]. The T1 contrast study further documented heterogeneous enhancement of the intracanalicular extramedullary intradural mass (measuring 3.0 × 1.6 cm in size). Based on these findings, a tentative diagnosis of meningioma was established.

Surgery

The patient underwent a T9 to T11 laminectomy. At surgery, the lesion was chalky/white, invaded the ligamentum flavum, adhered to the dura mater, and compressed the cord. [Figure 2 and Video 1]. It was removed without incident. The histological examination showed nodules and islands of an amorphous, basophilic material, surrounded by chronic inflammation, and multinucleated giant cell, all of which confirmed the diagnosis of tophaceous gout [Figure 3].

Outcome

Postoperatively, the patient's pain was resolved, and his neurological deficit improved. He was able to walk within 3 postoperative months as his motor examination in both lower extremities improved bilaterally to the 4/5 level. He was subsequently referred to a rheumatologist for further management of his gout.

DISCUSSION

We identified 25 similar cases of spinal tophaceous gout reported in the literature. As these lesions are rare and can mimic spondylitis, neoplasm, or abscess; a histopathological examination is critical for establishing the correct diagnosis and determining the appropriate treatment.

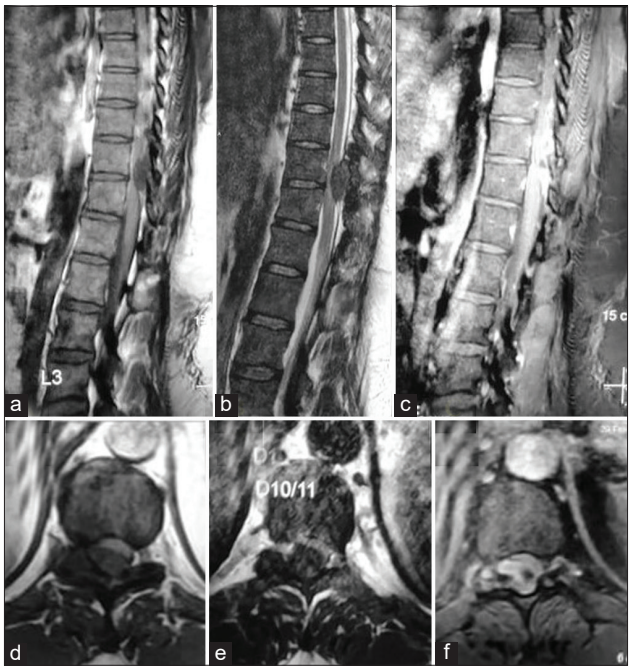

Figure 1: Magnetic resonance imaging of thoracic spines. (a) Sagittal plane T1-weighted section. (b) T2-weighted section. (c) Contrast-enhanced T1-weighted section. (d) Axial plane T1-weighted section. (e) T2-weighted section. (f) Contrast-enhanced T1-weighted section. The images show an oval extramedullary intradural mass lesion (3.0 × 1.6 cm in size) at T10-11 lying to the right posterolateral aspect of the spinal cord. The lesion shows heterogeneous low signal intensity on T2W images and iso- to low signal intensity on T1W images with moderate heterogeneous enhancement.

Prior cases of thoracic spine gout

Axial gout is a disease of middle-aged men (76%), with most cases occurring between the ages of 44 and 74; females are less affected as estrogen lowers uric acid levels.[1,8,10] When Toprover *et al*.[10] reviewed 131 cases of axial gout, it involved the lumbar spine (38%), cervical spine (24.8%), and thoracic spine (17.8%), respectively; further, in 19.4% of cases, it involved more than one spinal region.

In most cases, patients have a history of prior gouty attacks, hyperuricemia, and/or renal failure. Toprover *et al*.[10] reported that the abnormal laboratory findings in patients with tophaceous spinal gout were high serum uric acid was (79.8%), ESR and CRP (92%), total leucocyte count (28.6%), and serum creatinine (76.9%).

In our case, hyperuricemia was detected on preoperative investigations without any known prior history of gout or hyperuricemia.

Diagnostic imaging

Imaging, including either X-rays or MR (with/without contrast), is typically nondiagnostic for differentiating

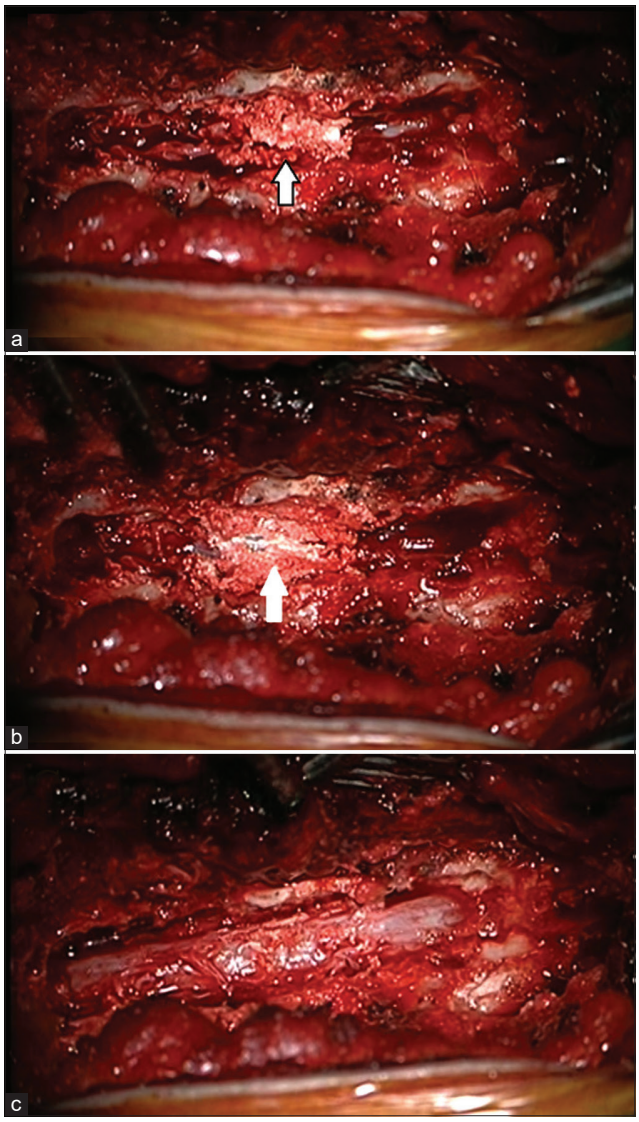

Figure 2: Intraoperative photographs. Intraspinal lesion (a) and Chalky white material firmly adherent to the dura mater (b) (see arrows). The dural sac after complete excision of the gout tophus (c).

spinal tophaceous gout from other lesions. On MR, a tophus may appear hypointense/isointense on T1, which may show variable intensity on T2, while contrast studies may demonstrate homogeneous/heterogeneous peripheral enhancement.[10] Typical CT scan findings include bone or joint erosions with well-defined sclerotic margins, facet or intervertebral bone neoformation, or juxta/intra-articular masses that were denser than the surrounding muscle. Although CT scans are more sensitive and specific than plain radiographs, they lack diagnostic accuracy.[10]

Dual-energy CT (DECT)

DECT is a promising, noninvasive modality for the identification and volumetric quantification of tophaceous gout. It is both sensitive and specific for diagnosing gout and readily distinguishes urate crystals from calcium using specific attenuation characteristics. In patients with known tophaceous gout, it can be used for serial volumetric quantification of tophi to assess response to treatment.[2,4]

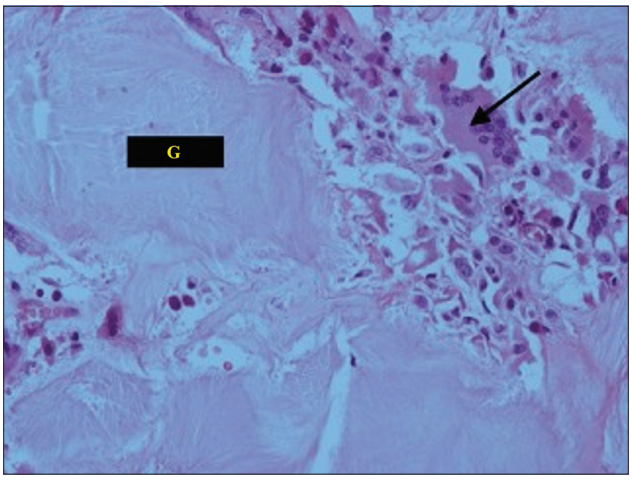

Figure 3: Microphotograph of histopathology showing acellular eosinophilia gouty tophi (G) surrounded by an inflammatory reaction and multinucleated giant cells (arrow) (H&E × 40).

Management of gout

Management of gout includes treatment of the acute attack, lowering uric acid levels to prevent additional flare-ups of gouty arthritis, and/or the further deposition of urate crystals. Acute medical treatment includes the administration of colchicine, nonsteroidal anti-inflammatory drugs, or both, while long-term therapy mandates urate-lowering therapy (e.g., allopurinol, febuxostat, or probenecid).[5,6,9] For cases, in which spinal gout contributes to neural-compressive syndromes, surgery for pathological diagnosis and decompression with/without fusion may typically warrant; subsequent pharmacological treatment is also typically indicated.[3]

CONCLUSION

When patients with gouty arthritis or known hyperuricemia experience the new onset of neurological symptoms/signs in the presence of a spinal lesion, spinal tophaceous gout should be considered among the differential diagnostic considerations, warranating appropriate surgical management with the pathological confirmation.

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Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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