CASE REPORT

Thoracic spinal gout mimicking metastasis

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Gout is a common metabolic disease but spinal gout is rare. We report a case of gouty arthritis affecting the thoracic spine in a 76-year-old male patient with a long history of tophaceous gout who presented with bilateral lower limb weakness. Magnetic resonance imaging of his thoracic spine revealed erosions in the left pedicles of T8 and T10. The initial imaging diagnosis was metastatic disease. A computed tomography–guided biopsy of the T10 lesion was performed and confirmed the diagnosis of gout. We advocate the use of computed tomography–guided fine-needle aspiration/biopsy for diagnosing spinal gout because the imaging features are non-specific, metastasis and spondylodiscitis being important mimickers.

Introduction

Gout arthritis is a common metabolic disease characterised by deposition of monosodium urate or urate acid crystal in joints and soft tissue. Its incidence is estimated at about 0.2 to 0.4% worldwide.[1] Involvement of the spine in gout is rare. We report a case of spinal gout affecting the thoracic spine where the diagnosis was made using an image-guided biopsy.

Case report

A 76-year-old man was admitted in March 2007 to the orthopaedic department for investigation of lower limb weakness and malaise. He had a long history of gout treated with allopurinol and gave no history of trauma. On physical examination, the patient appeared cachectic and had multiple subcutaneous nodules suggesting gouty tophi in both hands and both elbows. His lower limb power was normal but both knee jerks were brisk. Blood tests revealed anaemia (haemoglobin, 111 g/L) and an erythrocyte sedimentation rate above 100 mm/h. His white cell count was normal but his alkaline phosphatase was elevated to 300 IU/L. A radiograph of his thoracolumbar spine revealed mild degenerative changes but no definite bony erosions were noted. Computed tomography (CT) of his thoracic spine showed well-defined, non-calcified, lytic lesions in the left pedicles of the T8 and T10 vertebrae (Fig 1a). Contrast-enhanced magnetic resonance imaging (MRI) of the thoracic spine showed that the lytic lesions in the left pedicles of T8 and T10 were isointense on T1-weighted imaging and slightly hypointense with hyperintense foci on T2-weighted imaging (Fig 2a, 2b). No spinal cord compression was demonstrated. A Tc-99m whole body bone scintigram showed increased uptake at the corresponding sites (Fig 2c). The patient underwent a CT-guided biopsy of the T10 lesion for histological diagnosis (Fig 1b). The specimen showed mononuclear cells and multinucleated giant cells. Scanty needle-shaped crystals resembling urate crystals were detected but no malignant cells

Key words
Biopsy, fine-needle; Gout; Spinal diseases; Thoracic vertebrae; Tomography, X-ray computed

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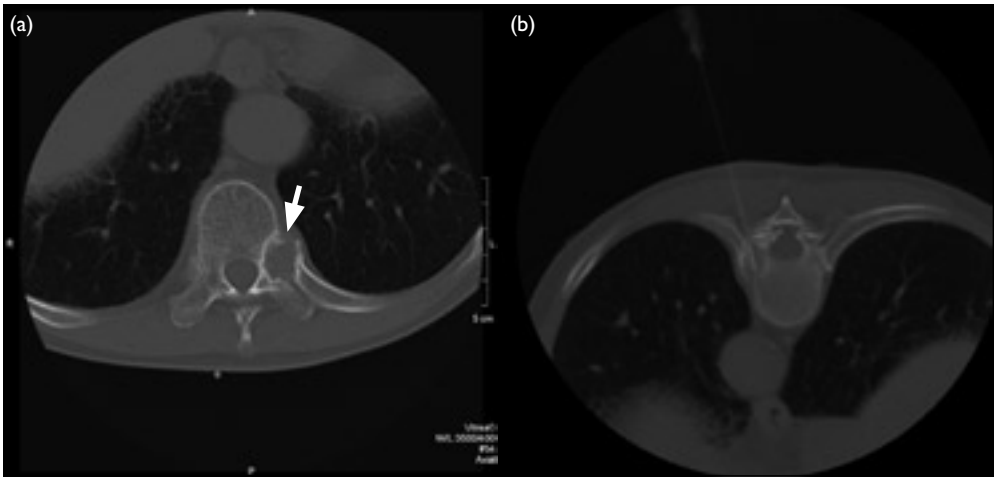

FIG 1. (a) Plain axial computed tomography (CT) of thoracic spine at T10 level shows a well-defined non-calcified lytic lesion in the left pedicle of T10 (arrow). (b) Plain axial CT shows biopsy needle in situ

擬似癌轉移的胸脊柱痛風

雖然痛風為常見的代謝病，脊柱痛風卻相當罕見。本文報告一個痛風性關節炎影響至胸椎骨的病例。一名患有長期結石性痛風的76歲男子出現雙腳無力，磁力共振顯示他胸椎骨T8及T10的左側椎弓根有侵蝕。起初的診斷為癌轉移。為T10傷口位置進行斷層照相活檢後，確診為痛風。由於此病的成像表現缺乏特徵性，容易被誤以為是癌轉移和椎間盤炎，所以我們推薦採用斷層照相導引下穿刺活檢來診斷脊柱痛風症。

were seen (Fig 2d). The differential diagnosis included granulomatous inflammation, eg mycobacterial or fungal infection, but the Ziehl-Neelsen and Grocott stains were negative. The presence of needle-shaped crystals was suggestive of urate crystals. Calcium pyrophosphate crystals are rhomboid shaped and associated with scanty, if any, foreign body giant cell reaction. A histochemical stain for urate was performed on a specimen obtained via fine needle aspiration but use of formalin, not alcohol, to fix the specimen meant the preservation of urate crystals on paraffin sections was suboptimal. Nevertheless, the raised serum urate and clinicoradiological features gave a picture compatible with urate crystal deposition and associated foreign body giant cell reaction, ie a gouty tophus.

It is our opinion that this is a case of spinal gout with gouty involvement of the costovertebral articulation as part of the disease. This is supported by the asymmetrical erosion, in which the pedicle was more severely involved than the rib.

The patient was managed conservatively and his symptoms gradually improved with physiotherapy and conservative treatment.

Discussion

Gout is most commonly found in peripheral joints, a phenomenon believed to be related to the lower solubility of monosodium urate crystal deposition in joints and soft tissue with lower body temperatures.[2,3] Spinal gout is rare. To the best of our knowledge, a total of 82 cases have been reported, including our patient.[2-10] Among them, 60 (73%) patients were men and 22 (27%) were women; 49 (60%) of them had a history of gouty arthritis. Sixty (73%) patients presented with neurological deficits of various degrees.

Degenerative changes are considered predisposing factors for gouty tophus deposition.[11] All segments of the spine can be involved in gout. The lumbar spine is the commonest region involved, seen in 46 (55%) patients. Twenty (24%) patients had cervical spine involvement while the thoracic spine was involved in 16 (21%) patients. The site of involvement can be the epidural space, intradural space, ligamentum flavum, discovertebral junction, the pedicles, facet joints, filum terminale, and neural foramen.[2]

Radiographs are insensitive for detecting spinal gout unless there has been significant erosion.[9] The underlying erosive changes in spinal gout are essentially similar to the changes in peripheral joints. On CT, spinal gout typically shows intra-articular and juxta-articular hyperdense masses causing bony erosions with well-defined sclerotic margins[12]—this CT feature was also seen in our case.

On MRI, gout tophi typically exhibit isointense-to-hypointense signal on T1-weighted images. Variable signal intensity on T2-weighted images has been reported. The high T2 signal may be related to a high protein content in the amorphous centre of the tophi. The low signal on T2-weighted imaging may represent calcifications, mature fibrous tissue and urate crystals.[4,9] Homogeneous enhancement and a heterogeneous peripheral enhancement gadolinium enhancement pattern have been observed in spinal gout. It has been postulated that heterogeneous enhancement related to hypervascular granulation

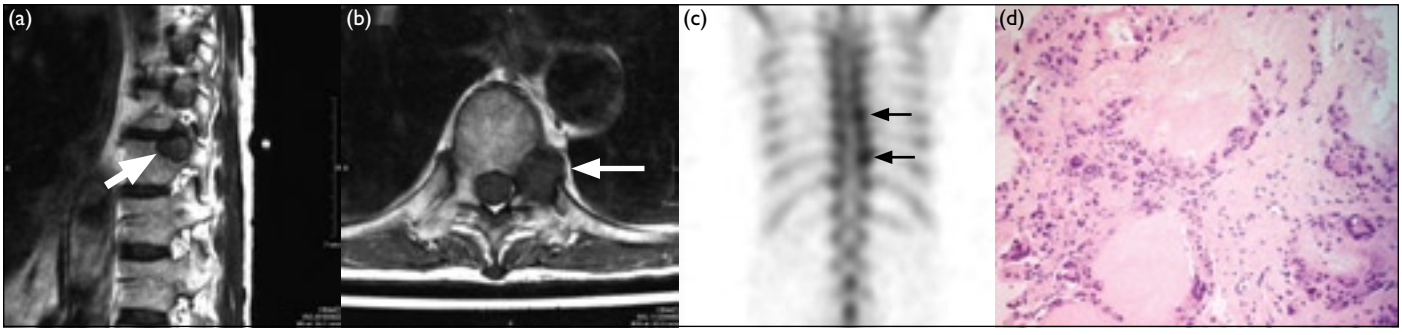

FIG 2. (a) Sagittal T2-weighted and (b) axial T1-weighted images show that the lesion is isointense in both T1- and T2-weighted sequences (arrow). Degenerative changes in the right costovertebral joint are noted. (c) Coronal slice of a bone SPECT (single photon emission computed tomography) indicates an increase in methylene diphosphonate uptake in the left pedicles of T8 and T10 (arrows). (d) The amorphous material is surrounded by multinucleated foreign body giant cells. Note the needle-shaped clefts among the eosinophilic amorphous material (H&E, x200)

tissue around the tophi, while homogeneous enhancement may represent vascularised reactive tissue within tophi.[2,4,9]

Only one case report has described the radiological features of spinal gout elicited using fluorodeoxyglucose-positron-emission tomography (FDG-PET).[5] The region of hypermetabolism seen on FDG-PET correlates well with the gadolinium enhancement in MRI.

The overall radiological features of spinal gout are rather non-specific. Differential diagnoses include discovertebral infection, epidural abscess, rheumatoid arthritis, metastatic disease, dialysis-related amyloid spondyloarthropathy, facet joint infection, synovial cysts, and calcified intradural tumour.[2,3] A history of gout, inflammatory arthropathies, renal failure, and primary malignancy are all important. Examination of peripheral joints must be included in the physical examination. Correlation with laboratory results such as the white cell count, urate level, autoimmune markers, and tumour markers are also useful. As the imaging features of spinal gout are non-specific, the use of an image-guided fine needle aspiration/biopsy is advocated. This minimally invasive modality allows differentiation from other important mimickers of neoplastic disease or abscess and avoids unnecessary exploration.

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