CASE REPORT

Tophaceous gout of the spine: Case report and review of the literature

Goutte rachidienne : un cas clinique et revue de la littérature

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KEYWORDS
Tophaceous gout; Spinal compression; Tophus imaging

Summary Tophaceous gout of the spine is rare. We report here the case of a 68-year-old man with long-standing peripheral gouty arthritis who developed a progressive and painful weakness of the lower extremities. Radiological and histopathological findings confirmed the presence of tophaceous gout of the spine. Also presented is the case history, including the radiological and histopathological findings, and a discussion of the literature.

Introduction

Tophaceous gout is a common metabolic disorder in which monosodium urate or uric acid crystals are deposited in the appendicular joint and periartricular tissues [1]. Involvement of the axial skeleton is an uncommon finding. When it occurs, the patient may suffer from a variety of symptoms, including nuchal pain, backache and paraesthesia or quadriparesis secondary to cord or root compression [2]. To date, approximately 50 cases have been reported [3]. Confirmation of the diagnosis is usually not made until examination of a biopsy specimen [4]. In the present case, there was spinal tophaceous gout with exuberant periartricular tissue involvement leading to symptomatic cord compression.

Case report

A 68-year-old man with long-standing peripheral gouty arthritis (Fig. 1) was admitted to our hospital for exploration of acute lower digestive tract bleeding. He had a background history of chronic kidney disease and hypertension. Colectomy was performed, and the surgical side effects were highlighted by pneumonia.

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Computed tomography (CT) of the chest showed an abnormal anterior, epidural, partially calcified collection extending from D11 to L5 (Fig. 2), with bilateral involvement(4,9),(994,994) of the paravertebral muscles and an osteolytic lesion in the vertebral body of L5. During his three-week stay in intensive care, the patient lost 8 kg, and developed a progressive painful weakness of the lower extremities and decreased rectal tone.

To characterize the lesion, magnetic resonance imaging (MRI) was performed. It showed the same epidural collection (Fig. 3, a–c) extending to the vertebral body of L5 (Fig. 4) and paravertebral muscles, and compressing the spinal canal and causing cauda equina compression. This collection exhibited soft-tissue intensity on the T1-weighted sequence and appeared hypointense on the T2-weighted sequence. After administration of gadolinium, the collection showed heterogeneous enhancement, but was more pronounced along the peripheral margins. To exclude an infectious process, CT-guided 14-gauge needle aspiration of the lesion in the left paravertebral muscle was performed (Fig. 5).

Macroscopically, the lesion consisted of white chalky amorphous material. On microscopic examination, the soft tissue included an amorphous substance containing long, needle-shaped, urate crystals that were surrounded by foreign-body giant cells associated with the inflammatory response of mononuclear cells (Fig. 6). There was neither caseous necrosis nor tumor infiltration.

The definitive diagnosis was tophaceous gout of the lumbar spine but, unfortunately, the patient died a few days later because of pneumonia complications.

**Discussion**

Gout of the axial skeleton is an unusual manifestation of gout. A recent review reported that only 50 cases have been documented [3]. In some cases, gout can involve all segments and anatomical components of the spine—the vertebral bodies [5], pedicles, laminae, interapophyseal cartilage [6], and epidural and intradural spaces [7]. Usually, it is symptomatic, with clinical manifestations ranging from back pain to more severe neurological symptoms resulting from cord compression [2] or Brown-Séquard syndrome [8]. However, axial involvement can be totally asymptomatic and only discovered at autopsy [9].

Plain radiographs of the spine in gout can be normal or show non-specific degenerative changes. On CT imaging, periarticular tophi with juxta-articular bony erosions around facet joints can be observed, characterizing the chronic lesion [10]. Sometimes, diffuse stippled calcifications are encountered in the tophi [10].

On MR imaging, spine involvement can be seen in some cases as homogeneous intermediate-to-low signal intensity on T1-weighted images, and ranging from homogeneous high to homogeneous low signal intensities on T2-weighted sequences. After gadolinium administration, the tophi can show variable enhancement—from homogeneous to heterogeneous peripheral enhancement [10].

In our present case, the lesion presented with a low signal on T1- and T2-weighted sequences, gadolinium enhancement and partial calcification on CT.

However, observations from such imaging are not specific and may deceptively mimic a degenerative, inflammatory, infectious or neoplastic process. In our patient, granulomatous conditions were considered in the differential diagnosis, including tuberculous and fungal infections (given...
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the pattern of subligamentous epidural extension and relative preservation of the intervertebral disk spaces), as well as rheumatoid arthritis. The latter more commonly involves the upper cervical spine, and can be distinguished from gouty arthritis only by the isolation of urate crystals in epidural tophus deposits.

Confirmation of the diagnosis was made by biopsy. Gouty tophi are nodular, with chalky white centers consisting of monosodium urate crystals, proteins and mucopolysaccharides. Microscopically, urate deposits are negatively birefringent under polarized light, and surrounded by multinucleated histiocytes that are basically giant cells with

Figure 5  Computed tomography-guided needle aspiration of the left paravertebral muscle.

Figure 6  Photomicrographs of the sample obtained by aspiration shows a urate crystal magnified (a) × 100 and (b) × 400.

Conclusion

Although involvement of the axial skeleton in gout is rare, the diagnosis should be considered in patients presenting with long-standing peripheral gouty arthritis, with or without neurological involvement. The imaging appearances of tophaceous gout of the spine are somewhat variable, but the diagnosis of spinal tophaceous gout should be considered when periarticular deposits contain very low signal foci on all MR imaging sequences, and internal calcifications on seen on CT images. Confirmation of the diagnosis is made by biopsy.

Disclosure of interest

The authors declare that they have no conflicts of interest regarding this article.

References