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CASE REPORT

Multifocal skeletal tuberculosis involving the lumbar spine and a sacroiliac joint: MR imaging findings

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ABSTRACT
Sacroiliac joint tuberculosis is rare; its coexistence with vertebral tuberculosis is even rarer, with only a few such patients reported in the literature. We present magnetic resonance (MR) imaging findings of a patient with vertebral and sacroiliac joint tuberculosis, who had paravertebral, iliopsoas, and buttock abscesses accompanied by a gluteal pus-draining sinus tract. MR imaging is the most sensitive and specific imaging modality for diagnosing sacroiliitis at its early stage. Sacroiliac joint tuberculosis can reach advanced stages with extensive joint destruction and periarticular abscesses if diagnosis and treatment are delayed. A high index of clinical suspicion is required for an early diagnosis. The addition of a coronal SPIR T2-weighted sequence to the routine MR imaging evaluation of patients studied for lumbar disk disease may be useful for recognizing sacroiliac joint pathology at an earlier stage.

Key words: • *tuberculosis* • *spine* • *sacroiliac joint* • *psoas abscess* • *magnetic resonance imaging*

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Bone and joint involvement in tuberculosis is uncommon. While osteoarticular tuberculosis most commonly occurs in the vertebral column, less frequently affected sites are the hip, knee, and sacroiliac joints (1). The multifocal form of skeletal tuberculosis is exceptional, even in countries where the disease is endemic (2). Multifocal bony lesions may occur as a result of dissemination from a pulmonary or an osseous focus (2-4). Sacroiliac joint tuberculosis is rare (4-8); its coexistence with vertebral tuberculosis is even rarer, with only a few such patients reported in the recent literature (4, 9).

Tuberculosis causes significant destruction on both sides of the sacroiliac joint (10). In some cases, tuberculous lesions in the joint may spread to the inguinal and gluteal areas and produce abscess cavities (4). We present a patient with vertebral and sacroiliac joint tuberculosis, who had paravertebral, iliopsoas, and buttock abscesses accompanied by a gluteal pus-draining sinus tract. Magnetic resonance (MR) imaging findings are discussed in light of the literature.

Case report

A 70-year-old man presented with pain in his back and right buttock, malaise, and a pus-draining sinus in the right gluteal region. He had been experiencing low back pain for the previous 20 months. He said that he had noticed a 2-cm non-tender mass in his right buttock 6 months earlier which had erupted and had started to drain pus. He had also had fever and was given ciprofloxacin (500 mg/day) by a doctor. Despite this therapy, which had lasted for 2 months, his pain and pus drainage continued. Upon physical examination, his body temperature was normal. There were no reflex, sensory, or motor changes of the lower limbs. Range of motion of the hips was normal, although hyperflexion, hyperextension, and abduction of the right hip joint elicited pain. Pressure on the right iliac wing was also painful. Blood tests showed signs of inflammation; the erythrocyte sedimentation rate (ESR) was elevated (34 mm/84 mm, 30 min/60 min) and there was slight leukocytosis with a count of 9100/ml. The rheumatoid factor was normal, and a brucella agglutination test was negative. Chest x-ray examination was unremarkable.

MR imaging of the lumbar spine and pelvis was performed on a 1.5 Tesla scanner. MR imaging of the lumbar spine showed spondylodiskitis at the L1-L2 level accompanied by an epidural and a small left paravertebral abscess (Figure 1). MR imaging of the pelvis showed advanced right sacroiliitis and osteomyelitis, with extensive abscess formation spreading ventrally to the iliopsoas region, and dorsally to the gluteal region. The right iliopsoas abscess did not have any connection with the left paravertebral abscess at the L1-L2 level. Right sacroiliac joint space was enlarged; the joint margins revealed significant destruction and irregularity. Osteomyelitis of both iliac and sacral bones was evident

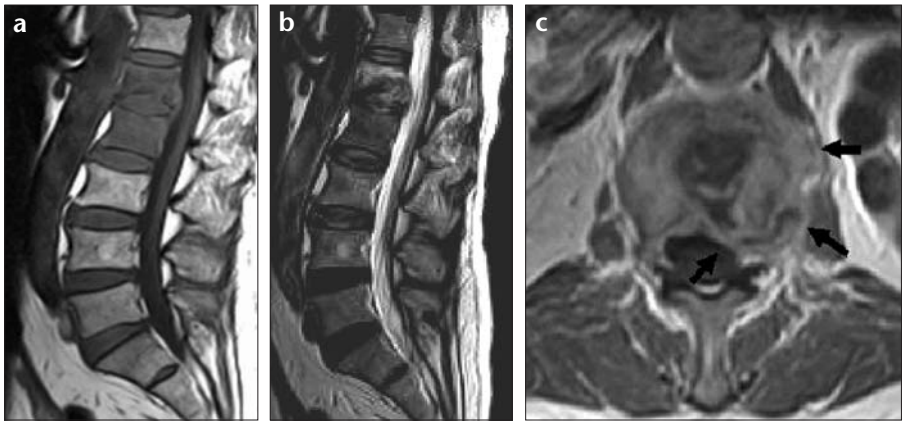

Figure 1. a-c. Tuberculous spondylodiskitis. Sagittal T1-weighted **(a)**, T2-weighted **(b)**, and transverse post-contrast T1-weighted **(c)** TSE MR images of the lumbar spine show spondylodiskitis at the L1-L2 level. Contrast enhancing epidural and left paravertebral abscess is also noted *(arrows)*.

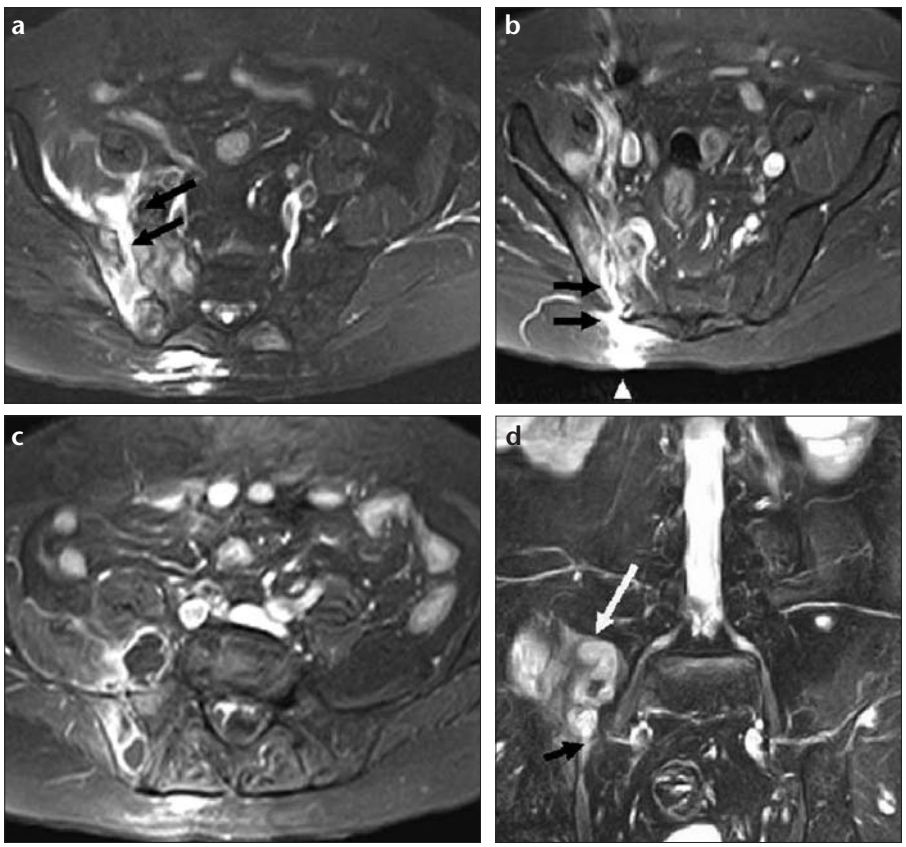

Figure 2. a-d. Tuberculous sacroiliitis in the same patient as in Figure 1. Transverse T2-weighted SPIR TSE MR images **(a, b)** show advanced sacroiliitis and osteomyelitis with accompanying iliopsoas and gluteal abscesses. High signal intensity pus drains into the iliopsoas region *(arrows,* **a***)*, and the gluteal region *(arrows,* **b***)*. The sacroiliac joint space is enlarged with significant destruction of the joint margins. A draining sinus is noted in the gluteal region *(arrowhead,* **b***)*. Transverse post-contrast T1-weighted SPIR MR image **(c)** shows contrast enhancement in the joint space, iliac and sacral bones, as well as iliopsoas and gluteal abscesses, which is consistent with extensive sacroiliac joint and periarticular inflammation. The size and extent of the iliopsoas abscess *(white arrow,* **d***)* are better shown on a coronal T2-weighted SPIR TSE MR image **(d)**. It is obvious that the iliopsoas abscess is related to the sacroiliac joint inflammation *(black arrow,* **d***)*.

with contrast enhancement. There was pus in the joint space which was draining with a sinus tract into the right buttock (Figure 2). Curettage of the sacroiliac joint and drainage of the abscesses were performed during surgery. Acid-resistant bacilli were detected microscopically, but they did not grow on Lowenstein-Jensen medium. Histopathological examination of the curettage material revealed granulomatous inflammation with caseous necrosis, infiltration of epithelioid cells, and Langerhans giant cell granulomas, all of which were compatible with tuberculosis. The patient was put on four-drug chemotherapy, which included isoniazid, rifampin, pyrazinamide, and ethambutol, and was protected from weight bearing. One month later, he was free of symptoms, his ESR dropped to 19 mm/49 mm (30 min/60 min), and he was continuing the chemotherapy regimen.

Discussion

Osteoarticular tuberculosis is estimated to affect only 2% of patients with tuberculosis. Of patients afflicted with skeletal tuberculosis, 50% present with spinal lesions, 30% have hip or knee disease, and 20% are infected at other, less well-known sites, such as the pubis, wrist, shoulder, and sacroiliac joint (10). In particular, sacroiliac joint involvement has been reported in 9.7% of patients with skeletal tuberculosis (11).

Tuberculous involvement of multiple bones or joints has rarely been reported. In a country endemic for tuberculosis, a patient who did not have a pulmonary focus presented with tuberculous lesions in 7 localizations, including the pubis, ischium, ilium, vertebra, rib, and both humeri (2). Another patient diagnosed with pulmonary tuberculosis later developed multiple tuberculous cold abscesses in various locations, as well as bone and joint tuberculosis in shoulder and wrist joints, and the vertebrae (3). Out of 16 patients with sacroiliac joint tuberculosis, 4 patients had simultaneous involvement of thoracic or lumbar vertebrae, and 5 patients had active pulmonary tuberculosis (4). Osteoarticular tuberculosis is thought to arise from the reactivation of the latent foci that were seeded during the primary episode, or to occur secondarily to the hematogenous or lymphatic spread of *M. tuberculosis* from reactivated pulmonary or extrapulmonary foci (7). In tuberculous sacroiliitis, the most common concurrent lesions are known to be tuberculous spondylitis and active pulmonary tuberculosis (4). Our patient's chest x-ray examination was normal; therefore, it is probable that the spread of infection

from spondylodiskitis at the L1-L2 level caused the involvement of the sacroiliac joint. Our case represents one of the few patients in the recent literature to demonstrate both vertebral and sacroiliac joint tuberculosis.

In skeletal tuberculosis, the onset of symptoms is generally insidious, and not accompanied by alarming general manifestations such as fever, night sweats, toxicity, or extreme weakness (10). Pain in the region of the involved joint is usually mild at onset. In tuberculous sacroiliitis, there is usually considerable delay between presentation and diagnosis, mainly due to its insidious onset, nonspecific clinical picture, and low index of clinical suspicion. Kim et al. reported a mean time from symptom onset to diagnosis of 8 months in a series of sacroiliac joint tuberculosis (4). The diagnosis in our patient was also delayed despite the recognition of a draining sinus in the gluteal region 6 months earlier, probably due to a low index of suspicion for tuberculosis. The low back pain he had suffered for 20 months might have been attributed to spondylodiskitis and, subsequently, to sacroiliitis. He had had fever only for a short time during pus drainage which had disappeared after antibiotic therapy, and constitutional symptoms indicative of tuberculosis were absent.

Although clinical and radiological findings, laboratory data, and aspiration cytology may be suggestive, the definitive diagnosis of sacroiliac joint tuberculosis can be established by the identification of *M. tuberculosis* bacilli or the histopathological examination of the curettage material (4, 6). Pseudowidening of the joint, early osteolytic destructive lesions, and eventual ankylosis are the cardinal radiographic signs (10). Computed tomography (CT) is useful in detecting early involvement of the sacroiliac joint and defining the extent of abscesses (7). MR imaging is the most sensitive and specific imaging modality for diagnosing sacroiliitis at an early stage (12). MR imaging was found to provide more useful information than 99m-Tc bone scans for localizing occult sites of bone inflammation (13). In our patient, MR imaging clearly showed the destruction at the joint margins, osteomyelitis of both the sacral and iliac bones, and pus in the joint space draining into the abscesses. The extent of abscesses and the sinus tract draining at the gluteus were also clearly demonstrated. Kim et al., in their series of 16 patients with sacroiliac joint tuberculosis, reported gluteal abscesses in 6 patients, inguinal abscesses in 2 patients, and draining sinus in 2 patients (4). Osman and Govender reported 2 buttock abscesses in a series of 14 patients (8). Keles et al. reported a case of tuberculous sacroiliitis with abscess formation in the sacroiliac joint and anterior periarticular soft tissue, demonstrated with MR imaging (6). To the best of our knowledge, the coexistence of a buttock abscess, iliopsoas abscess, and a draining sinus in a patient with sacroiliac joint tuberculosis has not been previously reported. Our case showed that sacroiliac joint tuberculosis is a destructive inflammatory process, which can reach an advanced stage with extensive periarticular abscesses, eventually draining out of the body, when diagnosis and treatment are delayed. Most patients with sacroiliac inflammation have low back pain, sciatica, buttock pain, and difficulty walking (12). Therefore, the addition of a coronal SPIR (spectral presaturation by inversion recovery) T2-weighted sequence covering the sacroiliac joints to the routine MR imaging evaluation of patients suspected of having lumbar disk disease may prove useful in the diagnosis of patients with sacroiliac inflammation at an earlier stage. In the early stages of sacroiliac joint tuberculosis, chemotherapy and bed rest may be adequate. Extensive joint destruction and abscess formation may require curettage and drainage (4,5). Kim et al. classified tuberculous sacroiliitis based on the clinical and radiological findings and suggested chemotherapy alone for the early stages, and surgery and chemotherapy for patients with severe joint destruction and abscess formation (4). We treated our patient with surgery and chemotherapy because of extensive destruction of joint margins and large abscesses. Arthrodesis was not done due to the absence of instability.

In a patient presenting with a unilateral destructive sacroiliac lesion, tuberculosis should always be in the differential diagnosis along with psoriatic arthropathy, Reiter's syndrome, and rheumatoid arthritis (10). The classical presentation of ankylosing spondylitis is that of bilateral, symmetric involvement of sacroiliac joints, whereas unilateral pathology is more typical of infection. Unlike pyogenic osteomyelitis, tuberculous osteomyelitis arises insidiously, and takes a chronic course that can be destructive and resistant to control.

In conclusion, tuberculous spondylodiskitis may rarely be accompanied by sacroiliac joint tuberculosis, which can reach advanced stages with extensive joint destruction and periarticular abscesses if diagnosis and treatment are delayed. A high index of clinical suspicion is required for an early diagnosis. The addition of a coronal SPIR T2-weighted sequence to the routine MR imaging evaluation of patients examined for lumbar disk disease may be useful in helping to recognize sacroiliac joint pathology at an earlier stage.

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