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Case Report

Sacroiliitis and sacral insufficiency fracture: A rare coexistence

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ABSTRACT

Sacral insufficiency fracture (SIF) is an uncommon cause of hip and back pain. Sacroiliitis, often a feature of inflammatory conditions of spinal column, is inflammation of sacroiliac joints. Herein, we report a 41-year-old woman presenting with a SIF and sacroiliitis as a part of non-radiographic axial spondyloarthritis.

Keywords: Osteomalacia, sacral insufficiency fracture, sacroiliitis.

Sacral stress fracture is one of the uncommon reasons of low back pain.[1] For the first time in 1982, Laurie[2] described sacral stress fractures in three elderly osteoporotic patients. Stress fractures are classified as fatigue and insufficiency fractures. Fatigue stress fracture occurs when excessive repetitive stress is placed upon a normal bone, while insufficiency fracture is caused by normal or physiological stress upon weakened bone with poor elastic resistance.[3] Sacroiliitis is one of the major findings of spondyloarthritis, which is characterized by inflammatory back pain.

Herein, we present a case of a sacral insufficiency fracture (SIF) and sacroiliitis, as a part of non-radiographic axial spondyloarthritis (nrAxSpA).

CASE REPORT

A 41-year-old female patient was admitted to the physical medicine and rehabilitation outpatient clinic with low back and hip pain for eight months. The pain worsened within the past two months. The patient had typical inflammatory back pain. Her pain was worsening at rest and night and improving by exercise with a gradual increase within the past two months. On physical examination, lumbar range of motion was limited and painful. Bilateral sacroiliac compression tests were positive. The range of motion of bilateral hip joints were also painful. Neurological examination findings were normal. Laboratory test results were as follows: erythrocyte sedimentation rate 33 mm/h and 25-hydroxyvitamin-D level 5.3 ng/mL. Other biochemical results were within normal range. To rule out brucellosis in the differential diagnosis, Brucella agglutination test was ordered which produced a negative result. The human leukocyte antigen (HLA)-B27 genetic test was, however, positive. As pelvic radiographs were normal, magnetic resonance imaging (MRI) of the sacroiliac joints (SIJ) was performed with the preliminary diagnosis of spondyloarthropathy. The T_2-weighted and coronal short-TI inversion recovery (STIR) images showed hyperintensity compatible with sacroiliitis of the iliac region on the left side (Figure 1) and a SIF on the right side (Figure 2) on coronal T_2 and STIR images. According to the Assessment of SpondyloArthritis International Society (ASAS) axial spondyloarthritis criteria,[4] the patient was diagnosed with nrAxSpA. The Bath Ankylosing Spondylitis Functional Index (BASFI) and Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) scores were 4.3 and 3.6,

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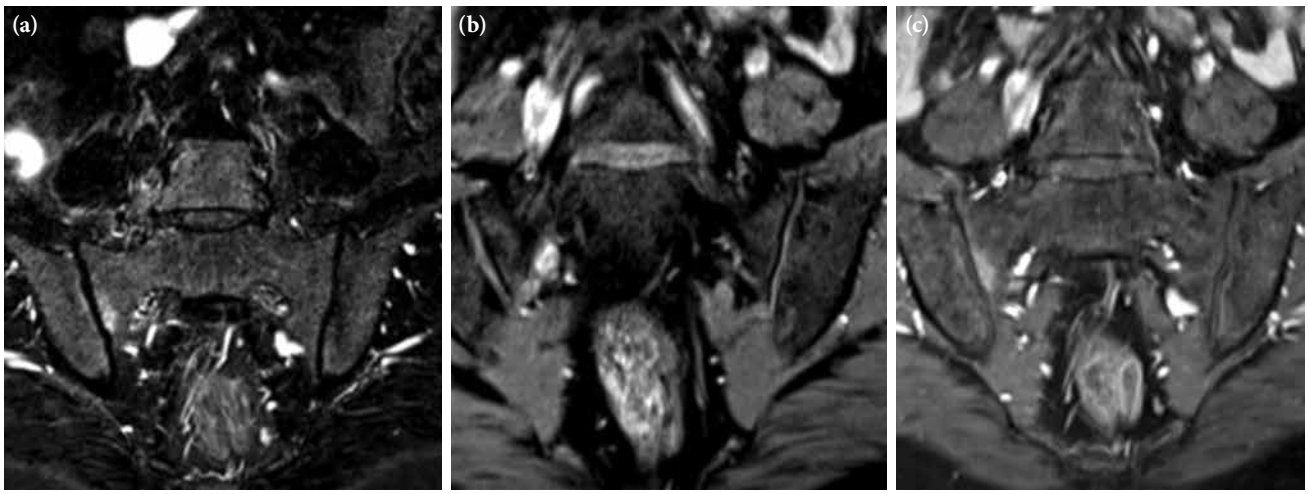

Figure 1. (a) T_2-weighted and coronal STIR image of left sacroiliac joint showing bone marrow edema and sacroiliitis (hyperintensity). **(b)** T_1-weighted coronal image of left sacroiliac joint showing sacroiliitis which cannot be seen obviously. **(c)** T_1-weighted and postcontrast fat-suppressed coronal image showing contrast enhancement on bony fragments with sacroiliitis. STIR: Short-TI inversion recovery.

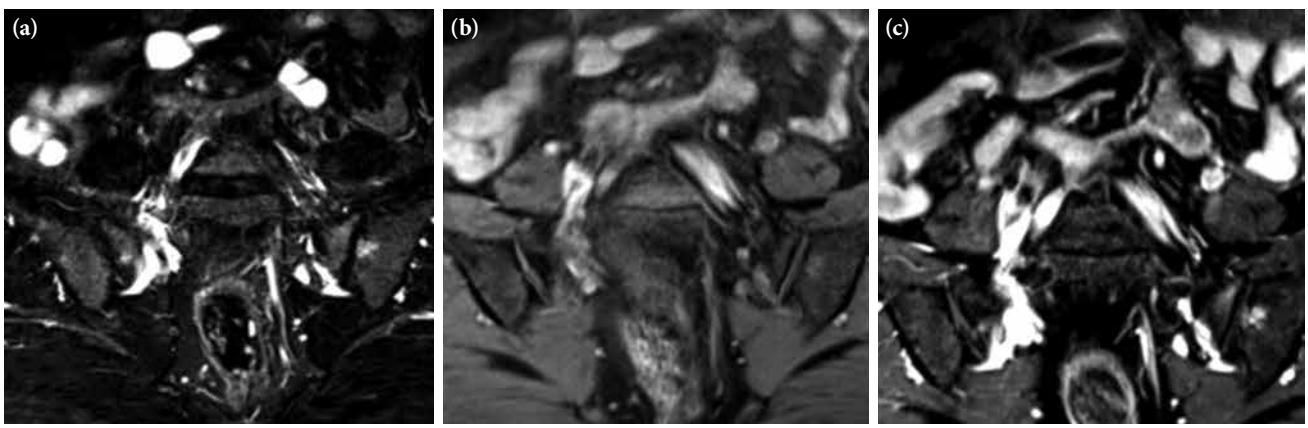

Figure 2. (a) T_2-weighted coronal image of adjacent right sacroiliac joint showing sacral surface edema (hyperintensity signal). **(b)** T_1-weighted coronal image showing hypointense signal changes related to small linear fracture line. **(c)** T_1-weighted and postcontrast fat-suppressed image showing minimal contrast enhancement.

respectively. The Visual Analog Scale (VAS)-pain score was 7. Treatment regimen with ibuprofen 800 mg bid for spondyloarthritis and 50.000 IU vitamin D3 for eight weeks for SIF was initiated. In addition, a three to six-week bed rest was recommended. Meanwhile, dual-energy X-ray absorptiometry (DEXA) was performed to rule out underlying osteoporosis, which yielded normal T and Z scores. At week 8 of follow-up, a significant improvement was observed with a decrease in all scale scores (VAS 3; BASFI 2.4; and BASDAI 2.1).

DISCUSSION

Sacral stress fractures are rare cause of low back pain. Sacral insufficiency fracture is a type of fracture which occurs without a stress factor. Predisposing factors of these fractures include osteoporosis, radiotherapy, rheumatoid arthritis, prolonged corticosteroid use, osteomalacia, and Paget disease. In addition, female gender, old age, and low bone mineral density are the major risk factors for SIF.[5,6] Patients mostly present with non-inflammatory low back pain symptoms. Patients should be examined meticulously for the differential diagnosis.

Laboratory tests usually show normal results with a mild increase in alkaline phosphatase levels.[7] In our case, the HLA-B27 positivity was obtained with SIF which might be related to vitamin D deficiency.

In certain cases, radiographs may not be sufficient to identify fractures. In the diagnosis of SIFs and sacroiliitis, MRI is more sensitive than computed tomography or X-ray imaging with increased detection rates of soft tissue lesions.[8] This imaging modality is also recommended by the American College of Radiology (ACR) for the diagnosis of stress fractures.[9] It is extremely sensitive and can detect stress abnormalities in the early stage of disease.[7] Similarly, in the present case, the diagnosis of SIF with sacroiliitis was made using MRI. Of note, the MRI findings of sacroiliitis and SIF are similar. In his study, Fredericson classified stress fractures according to the MRI findings.[10] Lesion severity is based on periosteal involvement, followed by medullary involvement and later cortical bone involvement. Grade 1, early stress phenomenon, is only positive on the STIR image. Grade 2 stress phenomenon has a positive STIR image and a positive T_2-weighted image. In Grade 3, MRI scan is positive in all sequences. True stress fractures can be seen in Grade 4 stress fractures.[11] Grading system is also needed to define the length of the resting time. The rest time was nearly three weeks in Grade 1, three to six weeks in Grade 2, and 12 to 16 weeks in Grade 3 and 4 lesions.[12] Magnetic resonance imaging criteria used to diagnose active sacroiliitis for nrAxSpA include osteitis/bone marrow edema, enthesitis, capsulitis, and synovitis. Osteitis/bone marrow edema are the initial manifestations of active sacroiliitis.[13] In the differential diagnosis of sacroiliitis, sacral SIFs and bone tumors, such as plasmacytoma and osteosarcoma, should be suspected for bone narrow edema/osteitis-like appearance on MRI. Radiologists should be informed about the clinical status of the patient to avoid misdiagnosis. In our case, MRI findings revealed sacroiliitis on the left SIJ and Grade 2 sacral stress fracture on the right side. In the patient whose main complaint was particularly low back pain, vitamin D deficiency was suspected as the cause of SIF. In addition, Vitamin D deficiency was thought to be additive in pain. Analgesics and a three-to six-week rest was recommended. Based on our experience, the SIF treatment depends on not only the underlying disease, but also should include pain control with analgesics and rest.

In conclusion, SIF and sacroiliitis may show similar imaging findings, particularly in early stages of SIFs, as in our case. The differential diagnosis is based on detailed history, physical examination, and imaging techniques. Although SIF is uncommon in young adults, it should be kept in mind in the differential diagnosis of patients presenting with low back pain. However, sacroiliitis is particularly the disease of young adults and, therefore, clinicians should be familiar with coexistence of SIF and sacroiliitis.

Declaration of conflicting interests

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