

Multiple insufficiency fractures mimicking bilateral sacroiliitis

Bilateral sakroileiti taklit eden multiple yetmezlik kırığı

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Abstract

The aim of this case report was to represent a case with multiple insufficiency fractures detected in an elderly female patient who was referred to our clinic for the differential diagnosis of bilateral sacroiliitis. A 71-year-old female patient was admitted to our outpatient clinic with the complaint of low back pain and also pain in her both hips and groin. On assessment of her musculoskeletal system, she had limited range of motion for low back and also had bilateral painful hip rotations. Bilateral Faber, Mennel and sacroiliac compression tests were positive. In her laboratory examination, 25-hydroxy-Dvit level was 3 ng/ml and parathormone level was 70 pg/ml. In consistent with physical examination pelvic radiograph revealed bilateral subchondral sclerosis in the sacroiliac joint, narrowing in the coxofemoral joint space, irregularity in symphysis pubis. Sacroiliac magnetic resonance imaging showed diffuse hypointense signal on T1-weighted images and hyperintense signal change on STIR images in the periarticular surfaces of bilateral sacroiliac joints and also fracture lines were detected on T1-weighted images. Subsequently, multiple insufficiency fracture lines were detected on the anterior face of the sacrum, bilateral iliac bones and the pubic ramus on the sacroiliac computed tomography. The patient was diagnosed with multiple insufficiency fractures due to vitamin D deficiency. Vitamin D was replaced and conservative treatment was planned. In conclusion, insufficiency fractures should be considered in differential diagnosis in elderly patients who present with low back pain and who have joint changes that may mimic sacroiliitis in imaging.

Key words: Sacroiliitis, stress fractures, vitamin D deficiency.

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Özet

Bu olgu sunumunun amacı, bilateral sakroileit ayırıcı tanısı için kliniğimize yönlendirilen yaşlı kadın hastada saptanan multiple yetmezlik kırığı gelişmiş olan olguyu sunmaktır. Yetmiş bir yaşında kadın hasta, bel ağrısı ve ayrıca her iki kalça ve kasık bölgesinde ağrı şikâyeti ile polikliniğimize başvurdu. Hastanın kas-iskelet sistemi muayenesinde, bel fleksiyonu ve ekstansiyonu kısıtlı ve ayrıca bilateral kalça rotasyonları ağrılı idi. Bilateral Faber, Mennel ve sakroiliak kompresyon testleri pozitifti. Hastanın laboratuvar incelemesinde 25-hidroksi-Dvit seviyesi 3 ng/ml ve parathormon seviyesi 70 pg/ml olarak saptandı. Fizik muayene ile uyumlu olarak pelvik radyografide sakroiliak eklemlerde bilateral subkondral skleroz, koksafemoral eklem aralığında daralma, symphysis pubiste düzensizlik saptandı. Sakroiliak manyetik rezonans görüntüleme, her iki sakroiliak eklemi oluşturan periartiküler yüzeylerde T1 ağırlıklı görüntülerde yaygın hipointens ve STIR görüntülerinde hiperintens sinyal değişikliği ve ayrıca T1 ağırlıklı görüntülerde kırık çizgileri saptandı. Sonrasında çekilen sakroiliak bilgisayarlı tomografide ise sakrumun ön yüzünde, bilateral iliac kemiklerde ve pubik ramusta multiple yetersizlik kırığı hatları saptandı. Hastaya vitamin D eksikliğine bağlı multiple yetmezlik kırığı tanısı konuldu. D vitamini replase edildi ve konservatif tedavisi planlandı. Sonuç olarak bel ağrısı ile başvuran ve görüntüleme de sakroileiti taklit edebilen eklem değişiklikleri olan yaşlı hastalarda, ayırıcı tanıda yetmezlik kırıkları göz önünde bulundurulmalıdır.

Anahtar kelimeler: Sakroileit, stres kırığı, vitamin D eksikliği.

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Introduction

Stress fractures are caused by repetitive overloading of a bone, exceeding its mechanical capacity [1]. Based on the properties of bone, the stress fractures can be classified as fatigue fractures, insufficiency fractures and pathological fractures [2]. Fatigue fractures occur within normal bone architecture that has been exposed to abnormal or repetitive stresses. On the other hand, insufficiency fractures are subtypes of stress fractures in bones with decreased mineralization and decreased elasticity, leading to a weakened zone of the bone [2, 3]. Finally pathologic fracture refers to a fracture in bone with an existing pathological condition such as tumor or infection [2]. Due to its variable presentation, stress fractures are often misdiagnosed. Under-recognition of stress fractures frequently leads to delayed diagnosis and treatment [2].

Insufficiency fractures may arise in the absence of even minimal trauma which can lead underestimation of these fractures [2]. The diagnosis is even more challenging in uncommonly reported sites of insufficiency fractures such as talus, sternum, first rib, and sacrum [2]. Sacral insufficiency fractures (SIF) are unusual cause of lower back pain and their occurrence is probably overlooked due to the lack of specific symptoms [4]. SIFs may be easily misdiagnosed as another entity. Several reports have previously highlighted the variable and non-specific presentation of SIFs that makes diagnostic challenge [5-7]. In recent case reports, the coexistence of sacroiliitis and SIF has been reported [8, 9]. SIF and sacroiliitis are two conditions that can occur with similar clinical presentation. The diagnostic challenge of detecting SIF in the differential diagnosis sacroiliitis has been rarely reported up-to-date [8, 9].

In this case presentation, we aimed to represent an unusual case with multiple insufficiency fractures detected in an elderly female patient who was referred to our clinic for the differential diagnosis of bilateral sacroiliitis.

Case report

A 71-year-old female patient, who was referred to our hospital for the differential

diagnosis of bilateral sacroileitis, was admitted to our outpatient clinic with the complaint of low back pain and also pain in her both hips and groin. There was no history of any trauma or falls. The patient reported morning stiffness lasting for half an hour in her both hips. Her medical history includes only surgery for lumbar herniated disc. On assessment of her musculoskeletal system, she had limited range of motion for low back and also had bilateral painful hip rotations. Moreover bilateral Faber, Mennel and sacroiliac compression tests were positive. Examination of other systems revealed no abnormality.

In her laboratory examination, erythrocyte sedimentation rate was 39 mm/h, C-reactive protein level was 0.4 mg/dl, 25-hydroxy-Dvit level was 3 ng/ml and parathormone level was 70 pg/ml. These results revealed Vitamin D deficiency as well as parathormone level was slightly higher than normal limit. All the other laboratory findings were within normal limits. Brucella agglutination test was also negative which ordered to rule out brucellosis in the differential diagnosis.

Radiographs of the lumbar spine and pelvis were performed. L2-S1 fixation material due to prior surgery for lumbar herniated disc, findings of spondylosis and osteoporosis were detected in the lumbar radiograph. On the other hand in consistent with physical examination pelvic radiograph revealed bilateral subchondral sclerosis in the sacroiliac joint, narrowing in the coxafemoral joint space, irregularity in symphysis pubis (Figure 1). Dual X-Ray absorptiometry examination was performed due to osteoporosis in lumbar radiography and femoral neck T score was found -3.2 and total hip T score was found -2.7. Based on the findings of pelvis radiography sacroiliac magnetic resonance imaging (MRI) was taken which showed diffuse hypointense signal on T1-weighted images and hyperintense signal change on STIR images in the periarticular surfaces of bilateral sacroiliac joints and also fracture lines were detected on T1-weighted images (Figure 2). Subsequently, multiple insufficiency fracture lines were detected on the anterior face of the sacrum, bilateral iliac bones and the pubic ramus on the sacroiliac computed tomography (Figure 3).

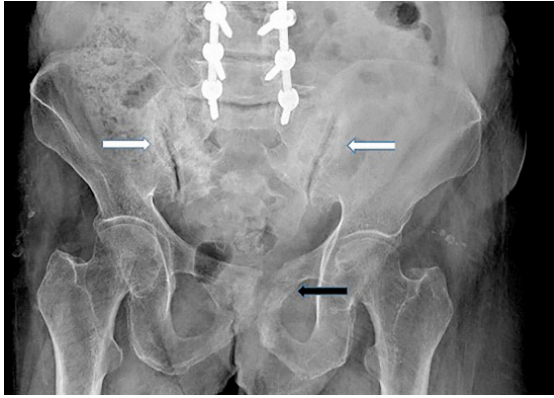


Figure 1. Pelvic radiograph demonstrating bilateral subchondral sclerosis in the sacroiliac joint (white arrows), narrowing in the coxofemoral joint space, irregularity in symphysis pubis (black arrow)

The patient was diagnosed with multiple insufficiency fractures due to vitamin D deficiency. Vitamin D was replaced and conservative treatment was planned as physical therapy along with analgesic therapy. Following physiotherapy, Vitamin D supplementation and adequate analgesia the patient had a considerable recovery.

Discussion

SIF is a type of stress fracture that occurs primarily in elderly women [10]. The diagnostic difficulty of SIFs has previously been recognized. SIFs generally present as non-specific pelvic or low back pain and are often misdiagnosed as other causes of pain [7]. In this case presentation, an unusual case was reported with multiple insufficiency fractures mimicking bilateral sacroiliitis.

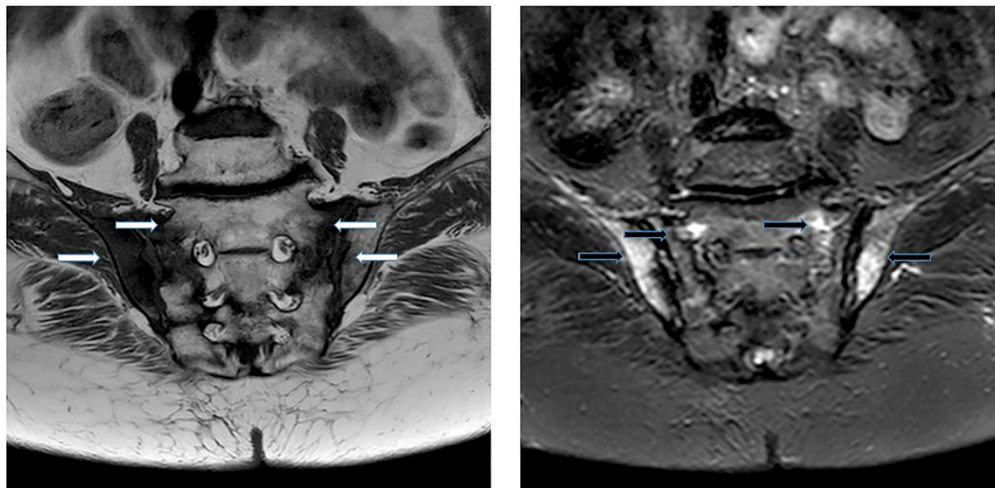


Figure 2. Sacroiliac MRI showing diffuse hypointense signal on T1-weighted image (white arrows) and hyperintense signal change on STIR image (black arrows) in the periarticular surfaces of bilateral sacroiliac joints and also fracture lines were detected on T1-weighted image

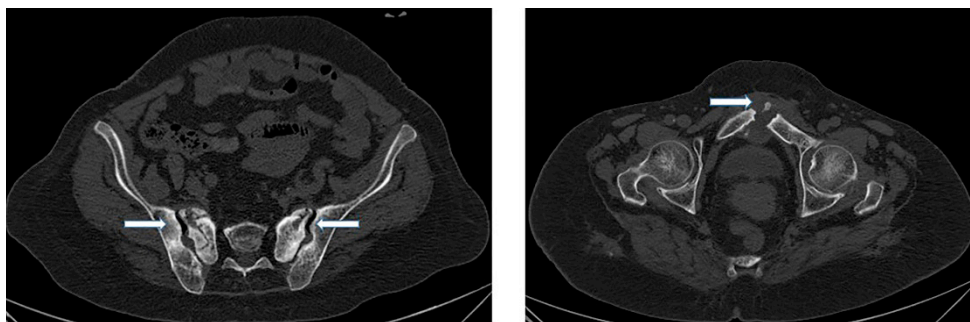


Figure 3. Sacroiliac computed tomography revealed multiple insufficiency fracture lines on the anterior face of the sacrum, bilateral iliac bones and the pubic ramus (white arrows)

Patients with insufficiency fractures frequently present with poorly localized, ill-defined pain and occasional nocturnal exacerbation. It is therefore prudent to maintain a high index of suspicion in patients with positive risk factors who present with atypical bone pain [11]. The risk factors include rheumatoid arthritis, Paget disease, radiation therapy, glucocorticoid-induced osteopenia, multiple myeloma, and hyperparathyroidism [7, 10]. In a recent case report, four cases of missed SIFs mimicking lumbar spine pathology were identified and treated subsequently [7]. Similarly our patient had nonspecific low back pain along with medical history of surgery for lumbar herniated disc.

A good clinical examination along with proper radiological investigation facilitates early diagnosis of insufficiency fracture [2]. A number of imaging techniques can be used to diagnose SIF. Plain radiographs and MRI scan are the most commonly used imaging modalities for the diagnosis of insufficiency fracture. In neglected cases or in cases of late presentation they appear as areas of sclerosis on plain radiographs. Scintigraphy, bone computed tomography or MRI, which are more sensitive in the detection of such fractures should be used early when plain radiographs fail to reveal fractures and the clinical suspicion is high [11]. In a retrospective analysis of 22 cases, difficult stress fractures mimicking tumour-like lesions on plain radiographs and MRI were analysed and concluded that computed tomography scanning was essential for making a diagnosis by detecting the fracture line in difficult stress fractures cases [3]. Fottner et al. recommend radiographs followed by MRI if the radiographs show no pathological findings [3]. The fracture line may be evident as hypointensity within the area of edema on MRI. The absence of a fracture line can create uncertainty [7]. In cases where MRI does not show the stress fracture, a computed tomography scan was most helpful. In accordance with these findings our patient also had similar radiological findings consistent with multiple insufficiency fracture on the anterior face of the sacrum, bilateral iliac bones and the pubic ramus.

Early diagnosis and prompt treatment can prevent the morbidity associated with these fractures. The standard treatment of these

fractures is conservative including bed rest, rehabilitation and analgesics [7]. Complications associated with prolonged immobilization can be seen in this conservative form of treatment. Although much of the literature regarding SIFs advocates bed rest, early mobilisation is also supported [10]. In the event of failure of conservative treatment, surgical treatment can be performed. In our case conservative treatment was planned as physical therapy along with Vitamin D supplementation and analgesic therapy similar to the literature.

In the differential diagnosis of SIFs, sacroiliitis should be also taken into consideration. The differential diagnosis is based on detailed history, physical examination, and imaging techniques. SIF and sacroiliitis may be present with similar pain. Although sacroiliitis is particularly the disease of young adults, SIFs occurs primarily in elderly. SIF and sacroiliitis may also show similar MRI findings, particularly in early stages of SIFs as reported in a case report [8]. Coexistence of SIF and sacroiliitis, as a part of non-radiographic axial spondyloarthritis was reported in a 41-year-old female patient [8]. In another case, coexistence of sacroiliitis and SIF has been reported in two cases and furthermore the authors concluded that MRI findings of both entities share common features leading to a diagnostic dilemma [9]. Radiologists should be informed about the clinical status of the patient to avoid misdiagnosis. Consistent with these case reports our patient also had radiographic and MRI findings similar to sacroiliitis.

In conclusion, insufficiency fractures should be considered in differential diagnosis in elderly patients who present with low back pain and who have joint changes that may mimic sacroiliitis in imaging. An increased awareness of these fractures may allow a prompt diagnosis and help avoid unnecessary treatment procedures.

Conflict of interest: No conflict of interest was declared by the authors.

References

1. Nishino T, Ochiai F, Yoshizawa T, Mishima H, Yamazaki M. Isolated distal fibular stress fracture after total hip arthroplasty in a patient with developmental dysplasia of the hip. *Case Rep Orthop* 2020;2020:6. <https://doi.org/10.1155/2020/4218719>

2. Vaishya R, Agarwal AK, Banka PK, Vijay V, Vaish A. Insufficiency fractures at unusual sites: a case series. *J Orthop Case Rep* 2017;7:76-79. <https://doi.org/10.13107/jocr.2250-0685.862>
3. Fottner A, Baur Melnyk A, Birkenmaier C, Jansson V, Dürr HR. Stress fractures presenting as tumours: a retrospective analysis of 22 cases. *Int Orthop* 2009;33:489-492. <https://doi.org/10.1007/s00264-007-0488-5>
4. Matar HE, Hassan K, Duckett SP. Insufficiency sacral fracture-dislocation mimicking suicidal jumper's fracture. *BMJ Case Rep* 2016. <http://dx.doi.org/10.1136/bcr-2016-216587>
5. Baldwin MJ, Tucker LJ. Sacral insufficiency fractures: a case of mistaken identity. *Int Med Case Rep J* 2014;7:93-98. <https://doi.org/10.2147/IMCRJ.S60133>
6. Wild A, Jaeger M, Haak H, Mehdian SH. Sacral insufficiency fracture, an unsuspected cause of low-back pain in elderly women. *Arch Orthop Trauma Surg* 2002;122:58-60. <https://doi.org/10.1007/s004020100333>
7. Sudhir G, Kalra KL, Acharya S, Chahal R. Sacral insufficiency fractures mimicking lumbar spine pathology. *Asian Spine J* 2016;10:558-564. <https://doi.org/10.4184/asj.2016.10.3.558>
8. Vural M, Üstün I, İnci E, Bes C. Sacroiliitis and sacral insufficiency fracture: a rare coexistence. *Turk J Phys Med Rehab* 2019;65:84-86. <https://doi.org/10.5606/tftrd.2019.1795>
9. Memetoğlu OG, Ozkan FU, Boy NS, Aktas I, Kulcu DG, Taraktas A. Sacroiliitis or insufficiency fracture? *Osteoporos Int* 2016;27:1265-1268. <https://doi.org/10.1007/s00198-015-3363-z>
10. Paker N, Tekdos D. Sacral insufficiency fracture: case report. *Turk J Phys Med Rehab* 2006;52:129-131.
11. Lee P, van der Wall H, Seibel MJ. Looking beyond low bone mineral density: multiple insufficiency fractures in a woman with post-menopausal osteoporosis on alendronate therapy. *J Endocrinol Invest* 2007;30:590-597. <https://doi.org/10.1007/BF03346353>

Contributions of the authors to the article

H.A., N.Y., A.S. and S.N.S.Ö. constructed the main idea and hypothesis of the study. H.A., N.Y., A.S. and S.N.S.Ö., evaluated and wrote the data in the case report section. The discussion section of the article was written by H.A. and S.N.S.Ö., N.Y. and A.S., reviewed the discussion section, made the necessary corrections and approved. In addition, all authors discussed the entire study and confirmed its final version.

Informed consent: Written informed consent was obtained from the patient.