

An Undiagnosed Sacral Insufficiency Fracture in an Osteoporotic Elderly Woman

Osteoporotik Yaşlı Bir Kadında Tanı Konulamayan Sakral Yetmezlik Kırığı

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ABSTRACT Insufficiency fractures occur when normal stress is applied to bone with low mineralization and elastic resistance. Postmenopausal osteoporosis, pregnancy, postpartum period, and sports activities can result in insufficiency fractures. Clinical suspicion is important in sacral insufficiency fractures. Computed tomography, scintigraphy, and magnetic resonance imaging are used in undiagnosed cases. Bed rest, analgesics, anti-inflammatory drugs, and physical therapy modalities can be used for pain control. Sacral insufficiency fracture should be kept in mind in elderly osteoporotic patients with low back and/or hip pain unresponsive to treatment. In this case report, we will present a 77-year-old patient with overlooked sacral insufficiency fracture. The patient, who had persistent low back and hip pain for three months, was misdiagnosed as sacroiliitis.

ÖZET Yetmezlik fraktürleri, mineralizasyonu ve elastik direnci düşük kemiğe normal bir stres uygulandığında oluşur. Postmenopozal osteoporoz, hamilelik, postpartum dönem ve spor aktiviteleri yetmezlik kırıklarına neden olabilir. Sakral yetmezlik kırığında klinik şüphe önemlidir. Tanı konulamayan olgularda bilgisayarlı tomografi, sintigrafi ve manyetik rezonans görüntüleme kullanılmaktadır. Ağrı kontrolü için yatak istirahati, analjezikler-antiinflamatuvar ilaçlar ve fizik tedavi modaliteleri uygulanabilir. Tedaviye yanıt alınamayan bel ve/veya kalça ağrısı olan ileri yaş osteoporotik hastalarda sakral yetmezlik kırığı mutlaka akılda tutulmalıdır. Bu olgu sunumunda, gözden kaçan sakral yetmezlik kırığı olan 77 yaşında bir hastayı sunacağız. Üç aydır dirençli bel ve kalça ağrısı olan hasta sakroileit olarak yanlış tanı almıştı.

Keywords: Insufficiency fracture; low back pain; microtrauma; magnetic resonance imaging

Anahtar Kelimeler: Yetmezlik fraktürü; bel ağrısı; hafif dereceli travma; manyetik rezonans görüntüleme

Sacral insufficiency fracture was first described in elderly patients by Lourie in 1982.¹ It is developed by normal or physiologic stress applied to weakened bones with decreased mineral content and reduced elastic resistance. These fractures occur usually in elderly patients. The risk factors are osteoporosis, osteopenia, rheumatoid arthritis, prolonged corticosteroid use, pelvic radiation, renal osteodystrophy, multiple myeloma, osteomalacia, hyperparathyroidism, fluoride treatment, diabetes mellitus,

fibrous dysplasia, Paget's disease, osteogenesis imperfecta, and mechanical factors.²⁻⁵ The incidence of sacral insufficiency fracture is 1.0-1.8%; however, rates as high as 5% have been reported.^{6,7} Although various radiographic modalities can be used to detect sacral insufficiency fractures, bone scintigraphy and magnetic resonance imaging (MRI) are the most sensitive methods.⁴ In this case report, an elderly patient with postmenopausal osteoporosis whose sacral insufficiency fracture was overlooked will be presented.

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CASE REPORT

A 77-year-old female patient, a housewife, applied to our outpatient clinic with complaints of low back and right hip pain that had been going on for three months. The patient stated that her complaints gradually increased, spreaded to her right groin, intensified while walking, decreased at rest, and felt the need to use a cane while walking. She described that she had no complaints such as fever, night sweats, and weight loss. Three months ago, her back had slightly stuck in an elevator door. She had a history of hypertension, osteoporosis, chronic kidney disease, and operation for lumbar discopathy. She had undergone total abdominal hysterectomy, and bilateral salpingo-oophorectomy 8 years ago. There was no bone mineral densitometry next to the patient, and it couldn't be reached from the electronic health system. However, we learned that her bone mineral densitometry was made at an external center and our patient stated that she had received intravenous zoledronic acid treatment two months ago due to osteoporosis. She have diagnosis of osteoporosis for 5 years and she had been receiving intravenous zoledronic acid infusion for 3 years, annually and calcium and vitamin D for 5 years. Before zoledronic acid, she had used alendronate 70 mg per week for one year.

In the musculoskeletal examination, the range of motion of the lumbar joint was open and painful in all directions. There was spasm of the lumbar paravertebral muscles on the right side. Right hip movements were painful and limited in all directions. Right

hip flexion was 110 degrees, extension was 20 degrees, internal rotation was 50 degrees, and external rotation was 10 degrees. Straight leg raise test and femoral nerve stretch test were positive on the right side. The sacroiliac compression test could not be evaluated because of the patient's pain. Visual analog scale (VAS) score was 9 at rest and night, 10 at movement. Her neurological examination was normal.

In laboratory analysis; hemoglobin 10.9 g/dL, hematocrit 35.7%, erythrocyte sedimentation rate 21 mm/s, C-reactive protein 6.7 mg/L, urea 35 mg/dL, creatine 0.95 mg/dL, glomerular filtration rate 58 mL/min. Serum electrolyte levels, liver function tests, rheumatoid factor, urinalysis, parathormone and thyroid tests were within normal limits.

Sacroiliac MRI performed at the external center that the patient went to 3 months before applying to our outpatient clinic was reported as diffuse bone marrow edema-inflammation (consistent with asymmetric sacroiliitis) signal changes on the sacral bone surface forming the right sacroiliac joint. MRI didn't reveal any linear fissure at that time.

We made the differential diagnosis of the factors that may cause sacroiliitis in this patient. Then, sacroiliac MRI and pelvic computed tomography (CT) were requested due to her history of low-grade trauma and osteoporosis. In sacroiliac MRI, fracture lines in the right superior pubic and inferior pubic rami and signal changes in favor of edema-hematoma in the surrounding soft tissues and muscle planes were observed (Figure 1).

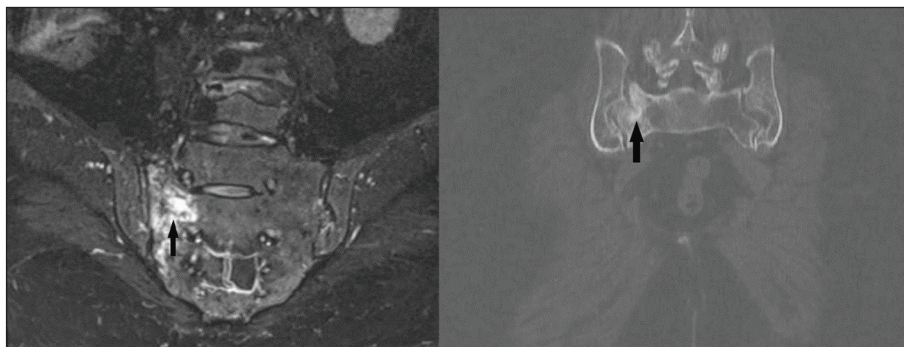


FIGURE 1: Appearance of the fracture lines in the right superior pubic and inferior pubic rami on magnetic resonance imaging and pelvic computed tomography.

On the pelvic CT, degenerative changes characterized by irregularities on both sacroiliac joint surfaces, increased subchondral sclerosis, and air values in the joint distances are observed on the right. In the right half of the sacrum, non-displaced fracture lines of the old fracture and intense sclerosis increase were noted (Figure 1).

In the light of these radiological assessments, our patient was diagnosed with sacral insufficiency fracture and admitted to a physical therapy program. Transcutaneous electrical stimulation (20 minutes 0-100 Hz, 50 μ sn, 5x7 cm, 2 electrodes) for analgesic purpose and ultrasound therapy (10 minutes 1 Watt/cm², intermittent 1 MHz frequency with 5 cm² head) to stimulate bone cell activity were applied to the right hip. At the same time, the patient was recommended rest and activity restriction for 8 weeks. Since our patient had chronic kidney disease, non-steroidal anti-inflammatory drugs were discontinued and low-dose opioid treatment was started. The VAS score, which was 9 at rest was recorded as 2 after an 8-week physical therapy program. Informed consent was obtained from the patient for this case report.

DISCUSSION

Insufficiency fractures, are usually associated with osteoporosis, induced by low bone mineral density and decreased bone quality, occur frequently in older people. Sacral insufficiency fractures are often underdiagnosed, missed by the majority of physicians or misinterpreted as malignancy or metastatic disease.^{5,7,8} The frequency of undetected sacral fractures is high. Some cases may be mistaken as bone metastases, causing patients to receive inappropriate diagnostic measures and treatments.^{7,8}

In the diagnosis of sacral insufficiency fractures, plain radiographs are often inconclusive. The use of MRI, CT scanning, positron emission tomography/CT, and bone scintigraphy to diagnose sacral insufficiency fractures has been described in the literature. Whole-body bone scintigraphy is a sensitive method for the diagnosis of sacral insufficiency fractures and it is often possible to see a typical characteristic “H” (Honda) sign that is visible when fracture lines are in the lateral sides and central part of

the sacrum. According to some studies, this sign is detected in 20%-40% of sacral insufficiency fractures cases.^{4,9-11} According to some studies, the sensitivity of bone scintigraphy to detect sacral insufficiency fractures is 96%.^{4,12} MRI and CT are widely used for the detection of sacral insufficiency fractures. MRI is the most sensitive tool for these fractures. The benefit of MRI is that it is highly sensitive to the presence of oedema, which is consistent with fractures, but may be confused with metastatic disease.¹³

The direct radiograph of our patient was normal. The first MRI was reported as bone marrow edema consistent with sacroiliitis. However, in the blood tests of our patient, acute phase reactants were in normal limits. She has no constitutional symptoms such as fever, night sweats, and weight loss. There was also no history of inflammatory bowel disease, psoriasis, or a family history of rheumatic disease, suggesting a possible spondyloarthropathy. In the present case, there was a history of mild trauma in the form of being stuck in the elevator door. Patients with sacral insufficiency fractures often suffer from pelvic pain or low-back pain which may radiate to the buttock or hip.^{4,5} These symptoms are non-specific and may mimic other clinical conditions, such as disc disease, recurrence of a local tumour, or metastatic disease.^{14,15} Our patient had pain in the right hip accompanying low back pain, and she felt the need to use a cane because she avoided putting weight on her right leg while walking. With all these clinical history and laboratory results, additional imaging methods were requested in line with the clinical suspicion of sacral insufficiency fracture. Sacroiliac CT and MRI clarified the diagnosis of our patient's sacroiliac insufficiency fracture.

Although there is no clearly established method in treatment of sacroiliac insufficiency fracture, the first suggested is conservative methods. Bed rest, analgesics, anti-inflammatory drugs and physical therapy modalities can be used for pain control. Narcotic analgesics can be used when necessary.¹⁶ It is controversial whether to recommend early rehabilitation or bed rest in the treatment.^{17,18} Since most of these fractures are considered stable and surgical intervention is not needed, it is recommended to initi-

ate rehabilitation and mobilization as early as tolerated. After good pain control, progressive ambulation with assistive devices and weight bearing at the tolerance limits can be started. With early mobilization, long-term bed rest, which is among the risk factors of these fractures, is prevented and complications such as decrease in muscle strength due to immobilization, deterioration in cardiopulmonary functions, deep vein thrombosis and negative calcium balance are reduced.¹⁷

Low-dose opioids for analgesic purposes were preferred because our patient had chronic kidney disease. Physical therapy modalities were used, and short-term bed rest was applied because daily life activities were limited due to pain. Upon the decrease in pain in the control examination, early mobilization was initiated to reduce the side effects of the immobilization. In addition, the patient who was administered zoledronic acid two months ago for

osteoporosis, continued with calcium and vitamin D₃ treatment. As a result, in elderly osteoporotic patients, if there is persistent low back and/or hip pain, sacral insufficiency fracture should definitely be considered, regardless of trauma history. Diagnosis should be attempted by clinical suspicion and advanced imaging methods.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

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