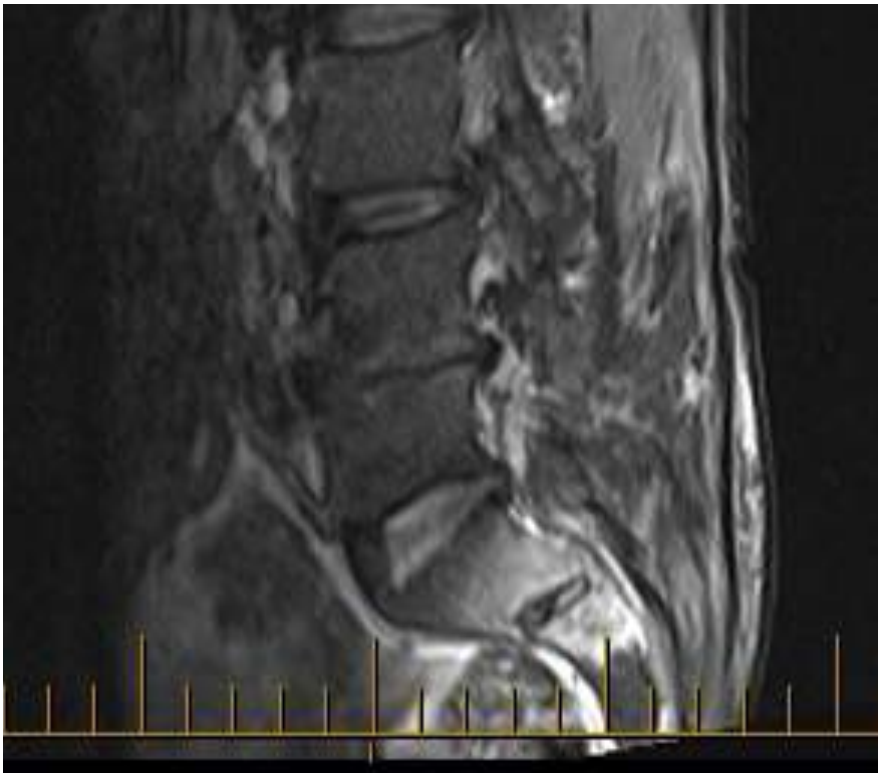
LOW BACK PAIN IN 70-YEAR-OLD

2 Years ago: chemo/radiotherapy + surgery for Adenocarcinoma of the rectum.



?Diagnosis. CEA within normal range.

Diagnosis: **INSUFFICIENCY FRACTURE SACRUM**

Sacral stress fractures have been classified by Pentecost into two groups: fatigue and insufficiency fractures.

Insufficiency fracture is a type of stress fracture, which occurs when normal or physiological stress applied to weakened bone with demineralization and decreased elastic resistance. This is associated with:

1.The osteoporosis
2. The long-term use of steroid or bisphosphonate
3. Rheumatoid arthritis
4. Radiation therapy (RT) in gynecological cancer, prostate cancer, anal cancer and rectal cancer [1,2,3].

It is sometimes confused with fatigue fracture, another type of stress fracture, which occurs with abnormal stress on normal bone. younger patients, with particular prevalence amongst long-distance runners and military personnel

Risk factors for sacral stress fractures during pregnancy or in the first weeks after delivery include vaginal delivery of a high-birth-weight infant, increased lumbar lordosis, excessive weight gain and rapid vaginal delivery.

Incidence

The actual incidence of insufficiency after RT is unknown, although it has been regarded as rare complication in the era of megavoltage equipment.

Recent study showed that RT substantially increases the fracture risk by hazard ratio of 1.65 to 3.16 [1,4]. In addition, several studies reported the cumulative incidence of IF after RT as 8.2% to 45.2% in cervical cancer, 9.0% to 11.2% in rectal cancer [1,2], and

Clinical Features

Though it occurs without any history of trauma, some patients may present with a history of trivial fall on the buttocks

Usually there is delay in diagnosis be cause of the general lack of awareness of this condition and the non-specificity of symptoms. Plain radiographs of the pel- vis are the first exam performed but they are often inconclusive,

The clinical presentation is diverse, from asymptomatic to severe pain which needs hospitalization. Most patients have no or minor trauma history. Patients usually com- plain of acute intractable low back or pelvic pain, associated with a severe reduction in mobility and a possible radiation to the leg, groin, buttocks and thighs without a history of trauma. Symptoms are exacerbated by weight-bearing activity, whereas they improve with rest and lying supine.

On the physical examination, tenderness over the sacral area may be present, but there are generally no specific findings that allow a specific diagnosis to be made [4]. Physical examination may reveal sacral tenderness on lateral compression [specific test]; the flexion-abduction-external rotation (FABER) test, Gaenslen's test and the squish test are often positive

The time to development of insufficiency fracture after radiotherapy is usually several months [7-40 months].

About 50% of patients who were detected by various imaging may be symptomatic and other 50% may be incidental finding. Extent of lesions may correlate with severity of symptoms.

Fracture associated with RT can be developed anywhere within RT field. The sacral fracture by pelvic RT is most frequently reported in the literatures.

Femur neck or sub-trochanteric fracture is infrequently reported [5]. Actually, the vertebral body fracture is the most common clinical presentation of insufficiency [IF] associated with osteoporosis, but in association with RT, it is mostly presented with pathologic fracture rather than IF.

PATHOGENESIS

The direct effect of radiation on mature bone is damage to osteoblast cells which result in osteopenia by decrease of collagen production and alkaline phosphatase activity

RISK FACTORS

Risk factors of osteoporosis: low body weight, female gender, current smoking, old age, rheumatoid arthritis, diabetes mellitus, hyperthyroidism, and corticosteroid therapy [4].

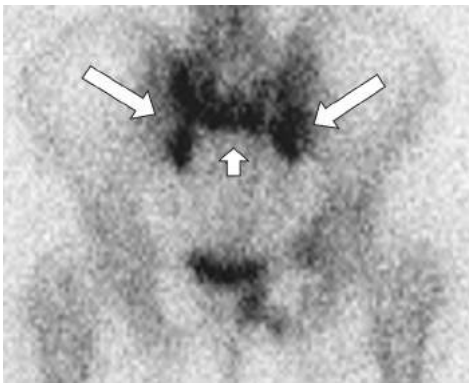
The treatment-related risk factors, such as the higher dose of RT, pelvic RT technique (the 4-field box vs. the AP/PA parallel opposing technique), and the use of chemotherapy, were also reported despite these associations have not always been statistically significant [4].

IMAGING

1. Plain radiography

Plain radiographs of pelvis, sacrum and lumbar spines showed sclerotic bands, cortical disruptions and fracture lines, however the subtle changes are not usually seen

2. Bone scintigraphy



Bone scintigraphy is sensitive to detect insufficiency fracture. The fractures usually show increased uptake on bone scintigraphy. The typical appearance of pelvic: the butterfly or Honda sign (H-sign), which means the fractures of both sacral alae and sacral body

In 45% of patients, may have unilateral lesions of the sacroiliac joints.

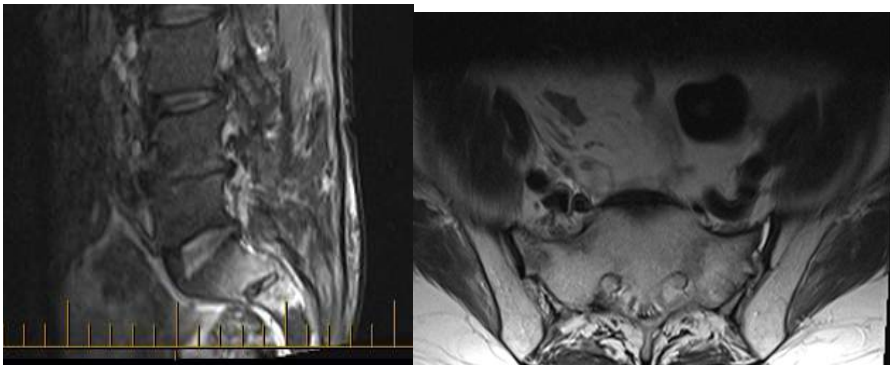
3. MRI

MRI is highly sensitive to detect.
The irradiated bone has bone marrow changes from the cellular bone components to fat, which shows high signal intensity on T1-weighted images, except an initial reactive marrow changes during the first 2 weeks of RT.

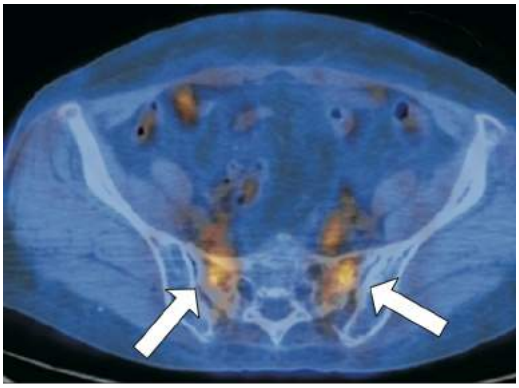
When fracture occurs, the diffuse reactive bone marrow changes with fracture line is noted on MRI, which shows reversed signal intensity with low signal intensity on T1-weighted images and high signal intensity on T2-weighted images. Linear areas with this abnormal signal intensity indicate the fracture line.

MRI is helpful to distinguish IF from the metastatic bone lesion. MRI is very useful tool to detect the soft-tissue component, thus the absence of focal or discrete mass lesion on MRI around fracture sites is important finding to distinguish it from metastatic bone lesion.

The majority of sacral stress fractures occur predominantly in the sacral wing (zone 1) and they have a vertical course, running parallel to the sacroiliac joint. Rarely, severe stresses can cause ad- ditional transverse fractures involving the sacral body.



4. ^{18}F FDG-PET or PET/CT



^{18}F-fluorodeoxyglucose-positron emission tomography (FDG- PET) has been used as an important imaging tool for the evaluation of patients with cancer, but there have been only a few reports describing the findings of FDG-PET scanning in patients with insufficiency fracture. The FDG-PET shows a variable degree of uptake depending on the stages of fracture (Fig. 7), sometimes it shows prolonged uptake.

TREATMENT

Fig. 9. C-arm image of case 4. Cement in the fracture site after sacroplasty is evident. The patient was mobilized and discharged on the same day.

Most symptomatic patients were fully resolved after conservative treatment using analgesics and rest, but some patients needs narcotics or hospitalization because of severe pain and disability those who generally have multiple sites of fracture or larger lesions. Mobilise with crutches or walker.

CT-guided sacroplasty for sacral IF was reported to be helpful in patients with pain resistant to conservative treatment [6]. The goals of sacroplasty are immediate pain relief, early mobilization, and rehabilitation to prevent the complications of recumbency.

Vit D an calcium

Biphosphonate: avoid pronged bisphosphonate therapy

Teriparatide

Raloxifene

Sacroplasty wit PMJA

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