

## Postpartum sacral fracture in a 30-year-old female

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Possible causes of sacral and low back pain in the postpartum patient include sacroiliac joint dysfunction, sacroiliitis, lower lumbar diskitis, and irritation of the sciatic nerve. Postpartum stress fracture is a recognized cause of pain that should be considered in the differential diagnosis of the postpartum patient's low back pain. Several case reports of postpartum stress fracture are now in the literature (1, 2, 3, 4, 5, 6, 7, 8). A 30-year-old female presented postpartum with pain in the coccyx region that was most severe nine weeks after the uneventful spontaneous vaginal delivery of her first child. Imaging with computed tomography (CT) obtained 36 days after delivery demonstrated bilateral sclerosis in the lower sacrum. Plain film radiographs may not demonstrate this finding. Both magnetic resonance imaging (MRI) and CT are sensitive for sacral stress fracture.

### Case report

Our patient was a 30-year-old female, with no significant past medical history, who had recently undergone normal spontaneous vaginal delivery of her first child at 41 weeks' gestation. She was five foot five inches and weighed 231 lbs just after delivery (BMI 38.4). The weight of the infant was 3,282 grams (7.24 lbs) at birth. She did not use heparin during or after pregnancy. The neonate was breast-fed. A postpartum problem list included depression and sacral pain. Symptoms included pain in her sacrum and coccyx region that began during pregnancy and increased after delivery. After delivery, the patient was unable to sit and spent most of the day walking around to avoid the pain. She found some relief when lying in the prone position. Narcotic prescription did not relieve the pain; however, the pain did not interfere with sleep. There was no history of trauma during or after the pregnancy or delivery. There was no documented family history of osteoporosis. Physical exam approximately one month after delivery showed no

ecchymosis of the low back or buttock. There was pain with palpation of the coccyx area. Equal strength and sensation was noted in the lower extremities. There was no incontinence. Gait was normal.

Pain persisted and was re-addressed at multiple postpartum visits. For this reason, plain films were requested to exclude fracture. Plain films of the pelvis obtained 29 days after delivery showed subtle irregularity along the anterior cortical margin of the S3-S4 segment intervertebral level, which could represent a possible nondisplaced fracture (Fig. 1). Computed tomography (CT) was recommended in the plain film impression to further evaluate this cortical irregularity (if clinically indicated) and was performed 36 days after delivery. CT examination demonstrated bilateral sclerosis and callus formation in the lower sacrum (Fig. 2). Sacral pain was most severe (10/10) at nine weeks after birth. The patient was placed on bed rest, with use of a walker with ambulation, for three weeks. The patient's pain level decreased slowly over several months; however, it did not completely resolve. Dual-energy X-ray absorptiometry (DEXA) was performed seven months after diagnosis of sacral stress fracture secondary to persistent pain; it demonstrated normal bone mineral density within the lumbar spine and bilateral femoral necks.

### Discussion

Possible risk factors for sacral stress fracture during pregnancy and in the postpartum interval include vaginal delivery, a large newborn, increased lumbar lordosis, use of forceps (1), heparin use (9), excessive weight gain, osteoporosis of pregnancy (10, 11, 12, 13), and sports activities.

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Figure 1. 30-year-old female with sacral and lower back postpartum pain. The radiologist reading lateral (A) and outlet (B) radiographs of the sacrum and coccyx noted a subtle cortical irregularity along the anterior cortical margin of the S3-S4 segment intervertebral level on the lateral view, suggesting possible nondisplaced fracture.

Stress fractures can be categorized as fatigue fractures caused by abnormal stress on a normal bone and insuffi-

ciency fractures with normal stress placed on a weakened bone. Sacral insufficiency fractures are frequently seen in older female patients with osteoporosis. Postpartum stress fractures all have a component of fatigue from weight gain



Figure 2. 30-year-old female with sacral and lower back postpartum pain. Coronal (A) and axial (B) CT images demonstrated vague sclerosis in the right lower sacrum and linear sclerosis in the left lower sacrum (arrows) indicating stress fractures and callus formation.

and abnormal stresses on the pelvis. Both postpartum fatigue fracture (2, 3, 4, 7, 8) and insufficiency fractures secondary to pregnancy-associated osteoporosis (1, 6) have been reported in the literature, and fracture may be the presenting sign of osteoporosis associated with pregnancy. The exact cause of pregnancy-associated osteoporosis has not been established. Fractures of the spine, neck of femur, wrist, and clavicle have also been reported in patients with osteoporosis of pregnancy (10, 11, 12, 13). Our patient had no additional risk factors for osteoporosis aside from pregnancy and lactation. Osteoporosis of pregnancy was not

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initially determined in our patient because bone density evaluation was not performed at the time of diagnosis; however, central bone mineral density was evaluated seven months after diagnosis and was normal, making the diagnosis of fatigue fracture more likely.

Pelvic and low back discomfort can be expected during pregnancy and in the immediate postpartum period because of relaxation of ligaments/soft tissues and immediate soft-tissue trauma (2). Not all patients should be evaluated for more serious complications (including stress fractures) as a cause of pelvic pain; however, pain that limits activities of daily living, pain that worsens rather than improves over time, and physical exam findings that localize to the bony pelvis (sacrum and coccyx) are indications for imaging. Plain film examination is not sensitive for this abnormality, as seen in this case and in the literature. MRI and CT cross-sectional imaging were the accepted diagnostic modalities in all reported cases. MRI has the added benefit of evaluation of the soft tissues. Nuclear medicine bone scanning may be sensitive as well, but it was not reported in any of the literature evaluated. Nuclear medicine bone scanning should not be used in a pregnant or breast-feeding patient, and for this reason it was not suggested in our breast-feeding patient. MRI is the most sensitive modality for determining stress fracture if plain films are negative; however, CT is better for evaluating a fracture line. In our case, there was some suggestion of a fracture line on the plain films, and CT was the next best step in evaluation. If the CT were negative, MRI could have been performed to evaluate for abnormal marrow edema suggesting a stress fracture. MRI would be recommended rather than CT for the pregnant patient to avoid radiation to the fetus. These fractures have a low risk of complication. Bed rest and analgesics are usually sufficient for treatment. Surgical intervention is not necessary (2, 6, 9).

In conclusion, sacral stress fracture (differentiated in this case from stress reaction by the callus noted on the CT scan) should be included in the differential diagnosis of a patient with persistent buttock and low back pain in late pregnancy or the postpartum interval. Plain film radiographs are the first step in evaluation of postpartum sacral pain but may not demonstrate this finding. Both MRI and CT are sensitive for sacral stress fracture.

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