Fractures due to transient osteoporosis of pregnancy

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In the third trimester, pain in the hips or the lower back is often attributed to normal physiology of pregnancy. Transient osteoporosis of pregnancy (TOP) is a rare and often misdiagnosed condition. Pain associated with TOP can become excruciating, immobilizing the patient and putting normal delivery at risk. Bone mass may be reduced, with T-scores indicating osteopenia.

The present article describes 3 cases of TOP at the Department of Trauma Surgery and the Department of Gynaecology, Technical University of Munich, Munich, Germany.

Patient 1 (33 years of age) fell on her right hip shortly after delivery and presented with immobilizing pain. Radiology revealed a femoral neck fracture without dislocation (Garden type 1) (Fig. 1A). To prevent femoral head necrosis, the fracture was fixed surgically (Fig. 1B). Postoperative limited weight bearing and vitamin D supplementation were recommended. A dual-energy X-ray absorptiometry (DXA) scan 4 years later, after a second pregnancy, revealed mild osteopenia. The patient’s vitamin D level was 9 ng/mL (normal range, 30–100 ng/mL), warranting supplementation before a third pregnancy.

Patient 2 (38 years of age) presented 11 days after cesarean delivery with bilateral os sacral insufficiency fractures (Fig. 1D), which were treated conservatively. Her DXA measurements were normal but her serum vitamin D level was 6 ng/mL.

None of the patients received anticoagulant therapy during pregnancy.

The pathophysiolog of TOP remains unclear and diagnosis is difficult. Three stages can be identified. Stage 1 is characterized by progressive discomfort over several weeks until near immobilization. Other conditions (e.g. osteonecrosis, infection, stress fractures) must be excluded. Magnetic resonance imaging—although used cautiously in pregnancy—may detect edema [1]. In stage 2, significant calcium demineralization is found and bone density scans may indicate osteoporosis [2]. During the third trimester, 80% of the fetal skeleton is mineralized, which requires massive maternal calcium transfer. Systemic upregulation of placental 1α-hydroxylase and increased serum levels of parathyroid hormone-related peptide may also have a role [3]. Symptoms of TOP usually disappear after delivery (stage 3). However, breastfeeding promotes further calcium loss, which can prolong recovery time. Calcium/vitamin D supplementation is encouraged. Weight bearing is limited postpartum in order to reduce secondary fractures.

The etiology of TOP is unclear but seems to involve neurologic and bone metabolism malfunctions [2]. Vitamin D deficiency seems to be relevant (as in the first and third cases) but it does not explain the localized bone demineralization and is not a universal finding [4].

Patients with TOP are treated conservatively, and fractures necessitate close interdisciplinary cooperation. Pregnancy should not be terminated in such cases but surgery may be indicated to prevent femoral head necrosis. Pain during pregnancy should be taken seriously and may require imaging. More research concerning prevention and early detection of TOP may help to avoid invasive modes of management.

Conflict of interest

The authors have no conflicts of interest.
Fig. 1. X-ray and magnetic resonance imaging. (A) Initial X-rays revealing a femoral neck fracture without dislocation (Pauwels type 1, Garden type 1). (B) X-rays of patient 1 after surgical fixation with a dynamic hip screw. (C) X-rays of patient 2 after surgical treatment of displaced femoral neck fracture with 3 screws. (D) Magnetic resonance imaging of the os sacrum of patient 3, showing bilateral insufficiency fractures with intraosseous edema (arrows).

References