



Neglected bilateral femoral neck fracture associated with pregnancy and primary hyperparathyroidism

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We report a case of neglected bilateral femoral neck fracture related with transient osteoporosis in pregnancy (TOP) and primary hyperparathyroidism, in a 33-year-old female who presented with a fracture of both femoral necks without any history of trauma 20 days after delivery. Her pain was at first accepted as common musculoskeletal discomfort following labour, and the final diagnosis was made only 25 days after fracture. She was treated with primary internal fixation with cannulated lag screws and received medical treatment for hyperparathyroidism and TOP. She was followed up for 29 months following the operation. No complications, and more specifically no avascular necrosis (AVN) were noted during this time interval. The patient made a complete functional recovery. We would like to emphasize that major medical problems may be underdiagnosed during the last pregnancy trimester and postpartum period. Delay in the diagnosis and treatment of a femoral neck fracture is an important but not a decisive factor for the development of AVN.

Keywords : transient osteoporosis of pregnancy ; hyperparathyroidism ; bilateral femoral neck fracture ; delayed treatment.

INTRODUCTION

Simultaneous bilateral femoral neck fractures are very rare. Such fractures are most often associated with metabolic diseases or other pre-existing pathologic conditions such as osteoporosis and tumours ;

an increasing number of such cases has been reported in literature. Delayed diagnosis is a common problem, which may affect the outcome. We report a case of simultaneous bilateral femoral neck fracture in the postpartum period, which was associated with primary hyperparathyroidism ; the fracture healed despite delayed internal fixation. The patient's consent for treatment and publication has been obtained.

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CASE REPORT

A 33-year-old female consulted the orthopaedic clinic because of pain in both hips, which had started spontaneously just after awaking in the morning 25 days before. She had a normal vaginal delivery 20 days before, following which she was walking normally. However, after the pain occurred, she could no longer stand up, and she took bed rest for 25 days. Her family thought this was normal post partum complaints, although she had been walking normally just after delivery. The family then brought her to the department of gynaecology and obstetrics, which in turn referred the patient to us. When she was seen by the orthopaedist on the same day, she was unable to actively move her legs, as she had hip pain with any motion. Both legs were positioned in external rotation. AP roentgenograms of the pelvis revealed a bilateral Garden type-3 femoral neck fracture (fig 1). There was no history of a traumatic event. She had had five pregnancies and four deliveries. She had a normal medical history and was free of any systemic disorder ; she had no hypocalcaemia symptoms. There was no history of alcohol abuse, smoking, or any drug intake such as steroids or anticoagulants. Her dietary history was unremarkable and there was no family history of endocrine or metabolic bone disease. A diagnosis of transient osteoporosis of pregnancy (TOP) was accepted at that stage.

Her hormonal levels were then studied and some abnormal results were observed such as Parathormone (PTH) : 202 pg/mL (normal value : 11.0-67.0), Calcium (Ca) : 9.5 mg/dL (8.4-10.3), Phosphorus (P) : 4.2 mg/dL (2.7-4.5 m), Alkaline phosphatase : 820 IU/L (0-270 U). No evidence of hyperthyroidism was found (T4 : 9.5 (4.8-12.8) mcg/dL, T3 : 37.2 (52-175) ng/dL, and TSH : 3.97. (0.25-4.0) mIU/mL). Serum cortisol level was in the normal range. Her height was 162 cm and her weight 69 kg, with a body mass index (BMI) of 26.3 kg/m² (49th percentile-slight overweight).

She was then seen in the endocrinology department, where primary hyperparathyroidism was diagnosed. She was started on medical treatment with calcium and vitamin D. Bone densitometry showed mild osteoporosis especially prominent

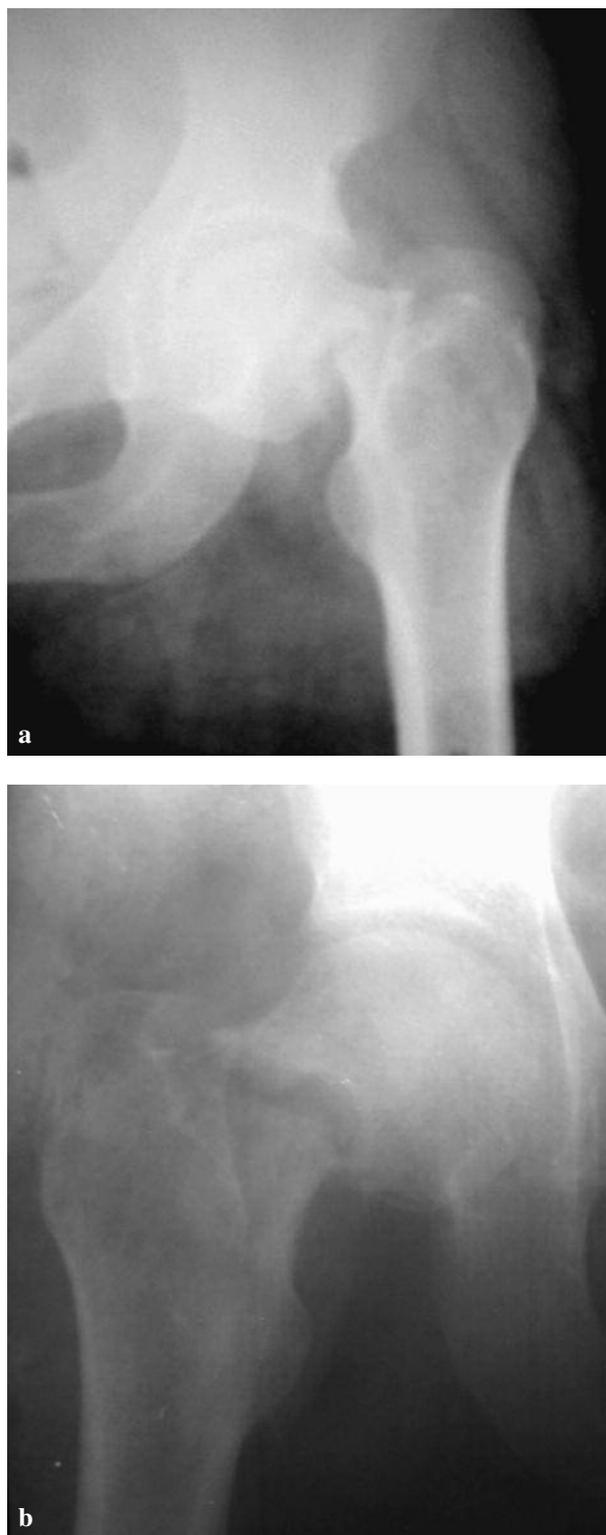


Fig. 1 a & b. — Preoperative pelvic AP roentgenogram showing bilateral Garden type-3 fracture of the neck of the femur.

around both hips (Dexa : T-score : -1.54, Z-score : -1.74). A parathyroid adenoma was diagnosed by ultrasonography (USG) of the neck. Stabilization of her medical condition and preparation for surgery were accomplished exactly 32 days after the fracture occurrence. She then underwent closed reduction and internal fixation with cannulated lag screws under C-arm fluoroscopy. We thought that she had limited chance for uneventful bone union. The high risk of avascular necrosis and nonunion was explained to her and to the family, as well as the possible need for total hip arthroplasty.

No complications were observed after the operation. At four days postoperatively, she was pain free and started to move her legs and to sit without help. Bed rest and rehabilitation under non-weight bearing condition was advised. She was not allowed to stand up. She was subsequently followed at intervals. She started to walk with canes 75 days after operation and she resumed unsupported ambulation after 120 days. Parathormone (PTH) and 25-Hydroxy Vitamin D levels were in normal range. The parathyroid adenoma was treated by the General Surgery department with conservative methods without surgery. The patient has now been followed up for two years. Her gait has completely returned to normal. Range of motion of the hips is full. Pelvic AP roentgenograms do not demonstrate any signs of avascular necrosis or nonunion (fig 2). Computed tomograms and MRI confirmed complete union and absence of AVN.

DISCUSSION

Bilateral fractures of the femoral neck are very rare. Cases reported in literature were secondary to a violent trauma, after a motor vehicle accident, due to fall of a heavy object over the femur and one was due to a fall from a height (1). Bilateral femoral fracture due to birth trauma, which is extremely rare, has also been reported in a newborn delivered by cesarean section (4). The most common aetiological factor for bilateral femoral neck fracture reported in literature is convulsions related with a variety of causes such as electroconvulsant therapy, psychic disorders, accidental electric shock, parathyroidectomy (8,14), contrast used in myelography (16), renal

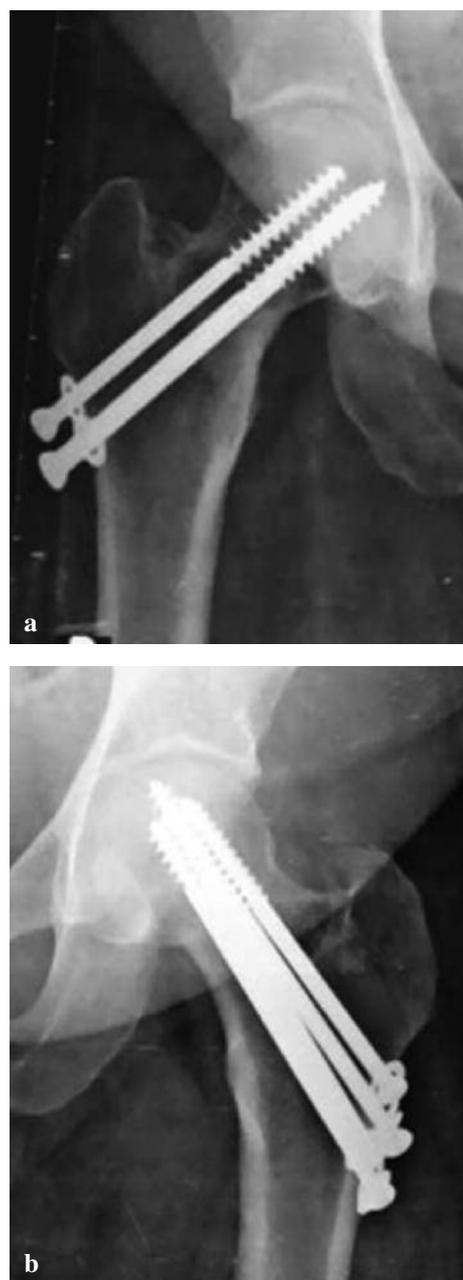


Fig. 2 a & b. — AP radiographs of both hips showing fracture union without any sign of AVN 29 months after internal fixation.

impairment and enterectomy inducing hypocalcaemia (6,23). Cases have also been reported in relation with pathologic conditions such as chronic dialysis (10), osteogenesis imperfecta (22), osteomalacia due to aluminum and magnesium containing

anti-acids (18), Marfan's syndrome (12), chronic alcoholism and hepatic cirrhosis (9). Ogun *et al* (19) reported the case of a patient who had been receiving haemodialysis treatment, and developed simultaneous, bilateral pathologic fracture of the hip. Bilateral stress fracture of the femoral neck was reported by Kalaci *et al* (11).

Bilateral fracture of the femoral neck associated with pregnancy induced transient osteoporosis has been reported previously (2,17). Transient osteoporosis in pregnancy (TOP) is an unusual, self-limiting, idiopathic condition particularly associated with the last trimester of pregnancy or the post partum period. It generally affects a single hip. Bilateral presentation and involvement of the knee have been rarely reported (13). Detailed history of the cases reveals mild hip pain particularly during the postpartum period. Treatment is conservative. Analgesics, intermittent traction, range of motion exercises, abductor strengthening exercises and restricted weight bearing are the preferred treatments (7).

Musculoskeletal complaints are very common during pregnancy. The position and weight of the gravid uterus alters the centre of gravity and loading patterns of the axial and appendicular skeleton, whilst hormonal changes lead to joint laxity, and fluid retention may cause neural compression (20). The majority of musculoskeletal complaints are not serious and are usually managed conservatively without a specific diagnosis. Thus, all complaints are undertreated. For this reason, some serious complications such as fractures just like in this case cannot be diagnosed early.

Five patients with femoral neck fractures associated with hyperparathyroidism were described by Chalmers and Irvine (5). None of the fractures united after internal fixation despite appropriate management of the underlying metabolic disease. The authors did not attribute the lack of healing to hyperparathyroidism, but rather to the vertical orientation of the fracture line and the preexisting coxa vara. They concluded that primary arthroplasty may be preferable to internal fixation in these patients (3).

There is a significant relationship between the risk of AVN and delay in surgical fixation of the fracture. When internal fixation of a displaced frac-

ture is performed within 12 hours, the risk of developing AVN has been reported to be 25%, versus 25-30% within 13-24 hours, 40% within 25-46 hours, and almost 100% after one week (15). The degree of fracture displacement is another major risk for AVN. Operations resulting in the reduction of the displacement is good to reduce the risk of developing AVN (21). We treated this patient surgically 32 days after the fracture. We strongly expected AVN to occur following the operation, based on all previous literature. However, the fractures united without any sign of AVN with a two years follow-up.

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