



Displaced intracapsular fracture complicating transient osteopenia of the hip in pregnancy : Timing of surgery

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A patient who presented with a displaced subcapital fracture of the proximal femur in her third trimester of pregnancy is reported. Following delivery of the baby with an emergency caesarean section, the fracture was immediately reduced and fixed using cannulated screws. The outcome of her fracture management for this rare condition is discussed. Only seven cases have been reported in the literature and we review the possibility that this condition may be a systemic rather than a purely localised problem as previously believed.

Keywords : osteopenia, fracture ; hip ; pregnancy.

INTRODUCTION

Transient osteopenia of the hip during pregnancy is an uncommon condition first described in 1959 (3). The most serious complication of this condition is a pathological fracture ; only seven cases have been reported in literature (2-5), of which only three had suffered a displaced sub-capital fracture. Of these patients one was managed conservatively for six weeks followed by a derotational osteotomy. The second, five days post-partum, underwent open reduction and internal fixation protected with a hip spica cast for seven weeks, and the third patient, two weeks post-partum, was treated by closed reduction and internal fixation followed by a hip spica for five weeks. We present a unique case that underwent emergency caesarean section and immediate closed reduction with internal fixation. Bone

mineral density scanning has provided new insight into this condition and indicates that this may represent a systemic phenomenon rather than a purely localised transient osteopenia of the hip.

CASE REPORT

A 31-year-old woman, 38 weeks pregnant, presented to the accident and emergency department with a painful left hip after twisting her leg in the morning. This was her first pregnancy and, apart from being diagnosed with symphysis pubis dysfunction three weeks prior to this, she was otherwise fit and well. She is originally from Turkey and has no relevant family history to note.

On admission she was in severe pain and required nitrous oxide, codeine and a femoral nerve block to reduce the pain. Her left leg was shortened and externally rotated and she was extremely tender over her anterior thigh and greater trochanter.

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Radiographs revealed a displaced intracapsular fracture of the femoral neck (fig 1). She was admitted for an emergency caesarean section with successful delivery of the baby. This was followed immediately by closed reduction of her fracture on a standard orthopaedic traction table and cannulated screw fixation. Reduction was checked intra-operatively with fluoroscopy and was deemed satisfactory. In total, fracture reduction and internal fixation had been performed fifteen hours after the onset of pain.



Fig. 1. — Radiograph at presentation, showing a displaced subcapital fracture of the hip

Post-operatively, she made an uneventful recovery and was allowed to mobilise non-weight-bearing. She was seen in clinic two weeks post-operatively, at which point she was pain-free and the wound had healed nicely. A bone mineral density scan was performed and routine blood screening to exclude any medical causes for a presumed diagnosis of transient osteoporosis during pregnancy. Blood testing was unremarkable and the bone mineral density scan demonstrated that she had a T score of -2.16 in her right femur and a Z score of -2.12. The corresponding T and Z scores for her lumbar vertebrae were -2.26 and -2.24 respectively.



Fig. 2. — Radiograph eight weeks post-operation, showing union of the femoral neck fracture.

The results indicate that she was osteopenic for age and population matched individuals in both her contralateral proximal femur and lumbar vertebrae. At eight weeks post-operatively radiographs revealed the fracture to be healing (fig 2) and she was allowed to start progressing to full weight-bearing. At six months post-operation she was seen in clinic and complained of groin pain. Repeat radiographs demonstrated osteonecrosis of the femoral head (fig 3) and she was referred for consideration of joint replacement surgery. Subsequent bone mineral density scanning at one year post injury has shown a T score of -1.7 for her right femur and -1.2 for her lumbar vertebrae with Z scores of -1.6 and -1.2 respectively.

DISCUSSION

Transient osteopenia of the hip is an uncommon condition and has two demographic peaks, one during the third trimester of pregnancy and the other



Fig. 3. — Radiograph six months post-operation, showing avascular necrosis and collapse of the femoral head.

between the fifth and sixth decade of life (6). It may be under-diagnosed during pregnancy due to the relative frequency of pelvic pain. Indeed our patient had been diagnosed with symphysis pubis dysfunction three weeks prior to presentation because of anterior pelvic pain.

The condition was initially reported in 1959 (3) as transitory demineralisation of the hip; the terminology has remained vague and for the purpose of this review osteopenia, osteoporosis and demineralisation all refer to the same process. The exact aetiology of the osteopenia in the hip during pregnancy is not known despite many proposals, including, inflammatory, viral, metabolic, neurological and mechanical causes (1). Pain, localised to the anterior thigh, groin or greater trochanter, typically occurs in the third trimester. Hip movements are often normal as are the usual laboratory tests. Antero-posterior radiographs of the hip typically demonstrate advanced osteopenia with rapid

improvement after delivery. Previous case reports have failed to discuss whether the osteopenia is generalised or localised solely to the affected hip. Brodell *et al* (2) pointed out that one of their cases demonstrated bilateral hip osteopenia. Isotope bone scans show increased uptake and MRI scanning showed evidence of bone marrow oedema, both localising to the area of osteopenia (8). It is usually a diagnosis of exclusion. The clinical course is relatively short, usually six months, and, benign, with complete clinical and radiological recovery.

Although pathological fractures are a serious but rare complication of this condition, fracture healing is normally rapid, as is return to full function. Surgical management of the displaced subcapital fracture remains unclear in this rare group of patients. Of the three cases reported, surgery had been performed either at six weeks (2), two weeks (4) or five days post-partum (5). Most authors would recommend that displaced subcapital neck of femur fractures are reduced and internally fixed within 24 hours (7) in order to best preserve the blood supply of the femoral head. In our patient, despite immediate surgery, the femoral head has become avascular. We note in the two cases presented previously that, as a result of the severe osteopenia, hip spica casts had been applied to protect the fixation for between five and seven weeks (4,5).

Interestingly bone mineral density scanning has confirmed the transient nature of this condition but also indicated the possibility that this represents a generalised state of transient osteopenia. Although Brodell *et al* (2) comment that radiologically both hips looked osteopenic in one patient, the other case reports do not comment on the contralateral hips. Bone mineral density scan was not performed in previous reports, unlike in the case reported here, and it may be that previous cases represented transient generalised osteopenia rather than purely transient osteopenia of the hip. This may lend further support to the aetiology being mediated by a hormonal response.

REFERENCES

1. Bramlett KW, Killian JT, Nasca RJ, Daniel WW. Transient osteoporsosis. *Clin Orthop Rel Res* 1987 ; 222 : 197-202.

2. **Brodell JD, Burns JE, Heiple KG.** Transient osteoporosis of the hip of pregnancy: Two cases complicated by pathological fracture. *J Bone Joint Surg* 1989 ; 71-A : 1252-1257.
3. **Curtiss PH Jr, Kincaid WE.** Transitory demineralisation of the hip in pregnancy. A report of three cases. *J Bone Joint Surg* 1959 ; 41-A : 1327-1333.
4. **Fingerroth RJ.** Successful operative treatment of a displaced subcapital fracture of the hip in transient osteoporosis of pregnancy. A case report and review of the literature. *J Bone Joint Surg* 1995 ; 77-A : 127-131.
5. **Fokter SK, Vengust V.** Displaced subcapital fracture of the hip in transient osteoporosis of pregnancy : A case report. *Int Orthop* 1997 ; 21 : 201-203.
6. **Kause J, Parr MJ.** Bilateral subcapital neck of femur fractures after eclamptic seizures. *Br J Anaesth* 2004 ; 92 : 590-592.
7. **Leighton RK.** Fractures of the neck of femur. In : Bucholz RW, Heckman JD & Court-Brown C, ed. *Rockwood and Green's Fractures in Adults*. Lippincott Williams & Wilkins, Baltimore, 2006, p 1763.
8. **Wood ML, Larson CM, Dahners LE.** Late presentation of a displaced subcapital fracture of the hip in transient osteoporosis of pregnancy. *J Orthop Trauma* 2003 ; 17 : 582-584.