

## Case Report

# Long-term results of a post-partum bilateral Garden 4 femoral neck fracture in a young woman with transient osteoporosis treated with closed reduction and internal fixation

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**Received:** 11 February 2023

**Accepted:** 21 March 2023

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### ABSTRACT

Bilateral femoral neck fractures are very rare conditions. In our knowledge, only five cases were reported of bilateral acute femoral neck fracture secondary to transient osteoporosis. The present case is the first with a long-term follow up after treatment with closed reduction and internal fixation. A 32-year-old women was admitted to the emergency orthopedic clinic due to severe pain in both hips and an inability to walk one-day post-partum. Clinical examination revealed bilateral externally rotated legs and X-ray showed bilateral Garden 4 displaced subcapital fracture of the neck of the femur. The patient was operated on urgently by closed reduction and internal fixation. Osteoporosis was found in the measurements of bone mineral density and bisphosphonate with vitamin D medication was started. 6 years after surgery the patient can carry out her daily activities without limitation. His Harris hip score was 97 points/right and 95 points/left; and the X-ray was normal regarding osteoarthritis and avascular necrosis. Internal fixation should be the primary choice for the treatment of a bilateral femoral neck fractures with a high degree of displacement in young adults even with reversible poor bone quality condition such transient osteoporosis.

**Keywords:** Bilateral femoral neck fracture, Transient osteoporosis, Internal fixation, Long-term results

### INTRODUCTION

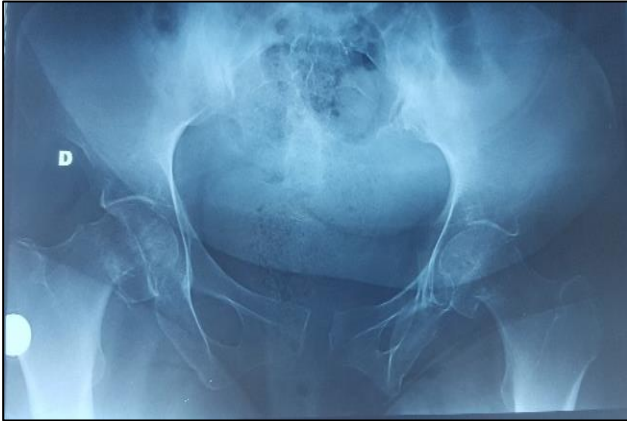
Bilateral femoral neck fractures are very rare conditions and have been reported in connection with bone-related disorders, chronic kidney disease, osteoporosis, vitamin D deficiency, epileptic seizures, electroconvulsive therapy, electrical shock, post-radiation, administration of corticosteroids as well as the deprivation androgen therapy.<sup>1-12</sup>

In our knowledge, only five cases were reported of bilateral acute femoral neck fracture secondary to transient osteoporosis.<sup>13-17</sup> The present case is the first with a long-term 6 years follow up.

### CASE REPORT

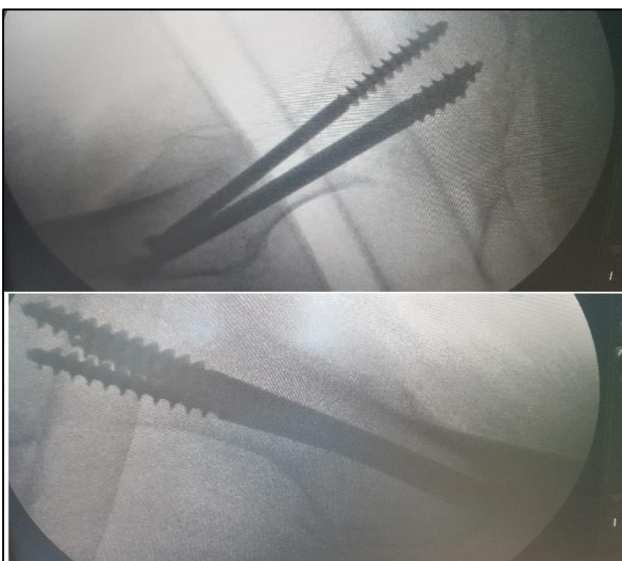
A 32-year-old women was admitted to the emergency orthopedic clinic due to severe pain in both hips and an inability to walk. Symptoms appeared just after her second delivery one day before. At 22 weeks of pregnancy, she was diagnosed with incomplete placenta praevia. The patient was kept at a strict bed-rest. At 38 weeks of pregnancy the patient was admitted in labor, vaginal delivery was successful and the baby weighed 3.4 kg. Five hours after delivery the patient complained of sudden onset of a new pain in her both hips despite a general improvement in pelvic pain following delivery. The patient was encouraged to mobilize, which she couldn't do. The pain persisted and the patient became immobile.

The patient had no medical history of hyperthyroidism, Cushing syndrome, liver or renal disease, and no history of corticosteroid, anti-convulsant or anticoagulant therapy. She was a non-smoker. There was no history or suggestion of trauma. Clinical examination revealed bilaterally externally rotated legs and X-ray showed bilateral Garden 4 displaced subcapital fractured neck of the femur (Figure 1).



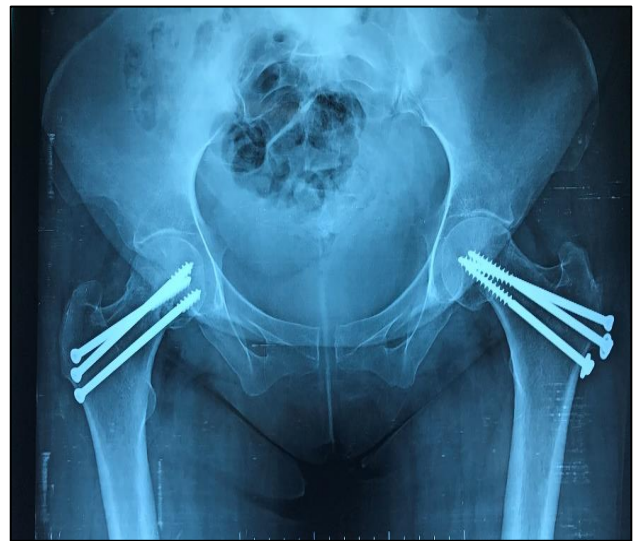
**Figure 1: Pelvic x-ray of bilateral sub-capital Garden 4 femoral neck fracture.**

The patient was operated on urgently. A closed reduction on the fracture table and internal fixation was applied to both hips by 3 cancellous screws (Figure 2). Her hip joint capsules were not perforated for decompression. Osteoporosis was found in the measurements of bone mineral density made in the lumbar region (T score -2.8). In-bed mobilization was started on post-operative day 1. Otherwise, The patient has started treatment with bisphosphonate and vitamin D. She was referred to a specialized rehabilitation. Partial weight bearing was authorized 3 months after surgery.

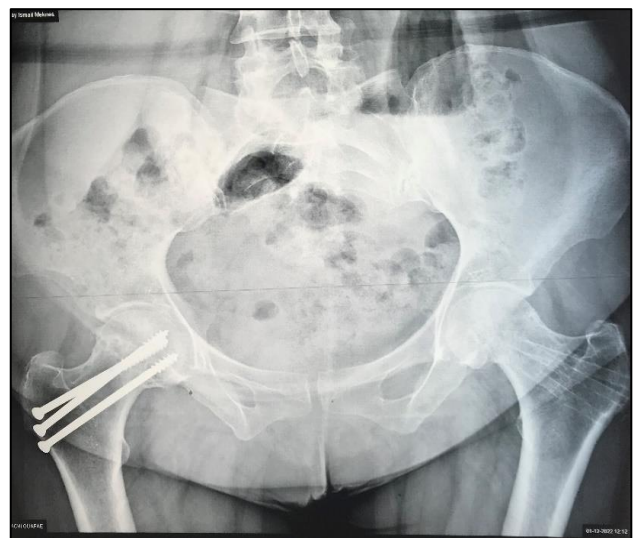


**Figure 2: Intraoperative x-ray of the internal fixation of both femoral neck fracture with cancellous screws.**

Clinical and radiological assessment at 4 months postoperatively showed a good function of both hip joints and bone union of the fractures (Figure 3) that allows independent walking with the help of a cane and climb stairs. At 6 months the patient was able to walk without cane; his Harris hip score was 87 points/right and 85 points/left. The patient was advised to continue rehabilitation exercises at home and in the swimming pool, 18 months after surgery no evidence of arthritis or avascular necrosis was found on direct X-rays, and the mineral density was normal (T score -0.2). Removing of osteosynthesis material was made in the left hip because of symptomatic screws. 6 years after surgery the patient can carry out her daily activities without limitation. Her Harris hip score was 97 points/right and 95 points/left; and the X-ray was normal regarding osteoarthritis and osteonecrosis of both femoral heads (Figure 4).



**Figure 3: 4<sup>th</sup> month follow up x-ray shows the bone healing of both femoral necks.**



**Figure 4: 5 years follow up: no sign of osteoarthritis nor osteonecrosis of both femoral heads.**

## DISCUSSION

Bilateral acute femoral neck fracture secondary to transient osteoporosis are very rare and raises a twofold issue: therapeutic: internal fixation of a poor bone quality or arthroplasty in very young patient; prognostic: the risk of osteonecrosis of the femoral head.<sup>13-17</sup>

Osteonecrosis of femoral head is a common complication of femoral neck fracture due to the vascular anatomy of the proximal femur. Although it can develop in any femoral neck fracture, avascular necrosis is particularly frequent (12-40%) in displaced (Garden type 3-4) fractures, and it could jeopardize the long term results of internal fixation.<sup>18</sup>

While the arthroplasty is the formal treatment for bilateral displaced femoral neck fracture in the elderly patient; for some authors, the risk of osteonecrosis of femoral head compels to perform bilateral hip arthroplasty in a single operation even in young patients despite the elevated threat of revision surgery.<sup>12,19-21</sup> For the others, the surgical treatment for young patients is primarily conservative and consist of internal fixation. All the reported cases of acute bilateral fracture associated with transient osteoporosis has been treated with internal fixation.

Except Fujita et al who performed MRI of both hips at 2 years' follow-up to rule out osteonecrosis of the femoral head, the results of the other authors were limited to short term follow-up.<sup>22</sup> Our case is indeed the only long-term result reported of a bilateral simultaneous Garden 4 femoral neck fracture associated with transient osteoporosis secondary to pregnancy treated with closed reduction and internal fixation. Rapid and correct surgical technic and bisphosphonate-vitamin D medication followed with a tailored long term rehabilitation protocol could ensure long-term good outcomes.

## CONCLUSION

This case suggests that internal fixation should be the first therapeutic option for the treatment of bilateral femoral neck fractures with a high degree of displacement in young adults even with reversible poor bone quality condition such transient osteoporosis.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: Not required*

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**Cite this article as:** Bennani M, Guenbdar M, Cherrad T, Zejjari H, Bousbaa H, Louaste J et al. Long-term results of a post-partum bilateral Garden 4 femoral neck fracture in a young woman with transient osteoporosis treated with closed reduction and internal fixation. *Int J Res Orthop* 2023;9:593-6.