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Case Report

Bilateral Neck of Femur Pathological Fracture in Young Female with Coxa Vara and Psoriasis Vulgaris - A Case Report

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Abstract

Introduction: Most of the hip fractures occur in elderly population, with 50% consisting of femoral neck fractures. In these patients, hemiarthroplasty or total hip replacement comprises the main line of management for early mobilization. However, 3–10% of these fractures occur in young adults where the main goal of treatment is to preserve the natural hip anatomy and biomechanics due to high functional demands.

Case Report: Here, we present a rare case of bilateral pathological neck of femur (NOF) fracture in young adult female, a known case of psoriasis vulgaris and developmental coxa vara. Patient was operated with cancellous cannulated screws and dynamic hip screw plating with good functional hip range of motion and immediate full weight bearing walk with walker.

Conclusion: In psoriatic patients, psoriasis vulgaris coexists with confluence of other psoriatic disorders and comorbidities, which result in osteoporosis, hypovitaminosis D, decreased bone mineral density, and propensity for fragility fractures mainly involving NOF.

Key words: Bilateral, Insufficiency fractures, Neck of femur, Osteomalacia, Pathological fractures, Psoriasis vulgaris, Stress fractures, Young female

INTRODUCTION

Most of the hip fractures occur in elderly population, with 50% consisting of femoral neck fractures. In these patients, hemiarthroplasty or total hip replacement comprises the main line of management for early mobilization. However, 3–10% of these fractures occur in young adults where the main goal of treatment is to preserve the natural hip anatomy and biomechanics due to high functional demands.[1]

Normal levels for serum Vitamin-D are >20 ng/ml, calcium >9.0 mg/dl, alkaline phosphatase 115–359 U/L, and parathyroid hormone 160–520 pg/ml.[2]

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Risk factors such as excessive alcohol abuse and tobacco consumption with deficiency in serum Vitamin-D levels causing severe osteomalacia due to inadequate sunlight (ultraviolet B) exposure, decreased intake in diet, malabsorption of Vitamin-D, or kidney and liver disorders play important role in such pathological neck of femur (NOF) fractures.[2,3]

Osteoporosis at NOF has a prevalence of 5% and low bone mass having 39%. Patients with sudden onset hip pain without any trauma and absent X-ray findings should be evaluated for serum Vitamin-D, alkaline phosphatase, and bone mineral density by bone scan or MRI to screen for pathological NOF fractures.[2,4]

There are various modalities of treating NOF fractures such as conservative management with derotation boot in elderly unfit patients and surgical treatment such as cannulated screws, dynamic hip screw, proximal femur nail, angled blade plates, dynamic condylar screw, and hip replacement surgeries.[5]

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Psoriasis is commonly seen in 50–69 years age group with prevalence being 1–3%. Recent literature supports the finding of increased risk of osteoporosis, decreased bone mineral density, and fragility fractures in psoriatic disease but the evidence for strength of association remains inconclusive. However, there has been definite association of psoriasis and fragility fractures. Hence, preventive measures for fragility fractures must be considered in these patients.[6]

CASE REPORT

A 24-year-old female came to our OPD with sudden onset left hip pain since 1 month without any history of trauma. Patient is unable to walk since. Patient has history of operated for right NOF fracture by cannulated screws 4 years back after a similar trivial trauma. She was a known case of psoriasis vulgaris, on medications and on X-rays; patient had an old left NOF fracture is shown in Figure 1. On blood reports, patient had serum Vitamin-D3 deficiency with value of 8 ng/ml.

Patient was posted for surgery after pre-anesthetic fitness.

Surgical Procedure

Patient was taken on operating traction table under all aseptic precautions and under epidural plus spinal anesthesia scrubbing, painting, and draping done. Reduction checked under C-arm after traction and internal rotation of hip. Lateral approach to hip with incision started at tip of greater trochanter extending distally along shaft of femur laterally about 10 cm. Soft-tissue dissected and tensor fascia lata incised along the incision. Vastus lateralis elevated from vastus ridge anteriorly after inverted L shaped incision. First guide wire was inserted inferiorly through calcar. Other two guide wires inserted anterosuperior and posterosuperior to it in an inverted triangle configuration. Triple reamer used to drill through first guide wire. Richard's screw of size 80mm is then inserted. Two cancellous cannulated screws 60 mm each were then crossed through fracture site. Traction released. Final tightening of Richard screw with top nut done. Both cannulated screws then tightened. Wound wash given with betadine solution and normal saline. Deep closure is done with vicryl 1 and 2.0. Skin closed with ethilon 2.0.

Figure 1: (a-d) Pre-operative X-rays showing the left neck of femur fracture in anteroposterior and lateral views with operative site showing psoriatic vulgaris skin lesions. Previously, operated the right neck of femur fracture with cannulated cancellous screws

Patient was full weight bearing with walker from post-operative day 2 with good functional range of hip motion.

Patient was started on weekly Vitamin-D3 60K capsules for 12 weeks.

Check dress done on day 3 and 7 found to be healthy with suture removal done at day 12. Follow-up X-rays at post-operative 8 weeks show good fracture union, satisfactory hip range of motion and full weight bearing walk without walking aide with ease of ground level activities such as squatting and cross legged sitting, as shown in Figures 2 and 3.

DISCUSSION

About 10–30% of non-union rates and 15–30% of osteonecrosis rates are observed after NOF fractures. Age and fracture displacement play an important role in determining these complications. Early literature suggested surgical reduction and fixation within 6–24 h after trauma determined better outcome whereas recent studies found no such correlation with time of surgery after trauma and femur head ischemia or non-union.[7]

Physiological age of the patient taking into account the pre-trauma activity level, comorbidities, bone strength, and quality determines the choice of management.[1]

Femoral head blood supply comes from medial circumflex femoral artery (MCFA), lateral circumflex femoral artery, and obturator artery. Of these, the majority of femur head and main weight bearing superolateral aspect are supplied by lateral epiphyseal branch of MCFA. In displaced NOF fractures, this artery gets damaged at postero-superior

Figure 2: (a-f) Post-operative X-rays at 2 months showing good fracture union and full weight bearing walk without walking aide with ease of ground level activities such as squatting and cross legged sitting

Figure 3: (a-f) Clinical pictures at 2 months post-operative showing satisfactory hip range of motion

aspect of NOF. In NOF fractures, the disruption of intracapsular arteries along with increased intracapsular pressure due to fracture hematoma is hypothesized as the reason for femoral head ischemia. Hence, pre-operative traction and surgical reduction lead to restoration of blood flow to head.[1]

Stress fractures of proximal femur are seen commonly in athletes and military trainees. They are further classified as insufficiency fractures occurring due to normal stress on weakened bone with associated pathological disorders and fatigue fractures occurring in normal bone due to excessive physical activity. Insufficiency fractures are commonly seen in patients with osteomalacia where there is decreased bone mineralization due to deficient serum Vitamin-D.[5]

A hip deformity with decreased neck shaft angle of <120° is termed as coxa vara which leads to deranged hip biomechanics due to concentration of focal mechanical stress in NOF which makes it vulnerable to stress fractures.[5]

Insufficiency or pathological NOF fractures have been commonly seen in conditions such as osteomalacia, pregnancy, pelvic irradiation, corticosteroid abuse, chronic renal disease, metabolic bone disease, and psoriasis vulgaris.[2]

These fractures in young adult compromise the femoral head blood supply lead to high probability of osteonecrosis and non-union even after internal fixation especially in displaced NOF fractures. This mandates anatomic reduction and stable internal fixation.[1]

In young adults, NOF fractures occur usually as a result of high energy trauma but in few cases of pathological disorders, trivial fall can also lead to NOF fractures.[7,8]

In rheumatic diseases such as psoriatic arthritis, bone strength is decreased by both the disease processes producing pro-inflammatory cytokines which promote osteoclastogenesis and destruction of arthritic bone. The immunosuppressive corticosteroids further weaken the bone strength. In psoriatic arthritis, there are synovial hypertrophy and hyperplasia with increased angiogenesis, inflammatory cell infiltrates and are negative for anti-citrullinated proteins.[9]

In the literature, osteoporosis has been documented in psoriatic arthritis patients with significantly low T and Z scores by Riesco and Manzano *et al.*[9]

Kocijan *et al.* stated that trabecular density was significantly decreased in psoriasis patients. There also has been increased prevalence of hypovitaminosis D, high bone turnover, and low bone mineral density pre-disposing to fragility fractures in psoriatic patients.[10]

CONCLUSION

In psoriatic patients, psoriasis vulgaris coexists with confluence of other psoriatic disorders and comorbidities, which result in osteoporosis, hypovitaminosis D, decreased bone mineral density, and propensity for fragility fractures mainly involving NOF. In these patients, the decreased bone quality further leads to focal stress and developmental coxa vara which further raises the fracture risk. Hence, in psoriatic patients, preventive measures must be undertaken for pathological fractures and bilateral hip radiological screening must be undertaken for any spontaneous hip pain with Vitamin-D3 supplementation and adequate sunlight exposure.

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