

## Non-traumatic fracture neck bilateral femur in patients on Anti-retroviral therapy

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### Abstract

**Introduction:** Anti-Retroviral Therapy (ART) in HIV+ patients is known to cause decrease in bone mineral density (BMD).<sup>1</sup> HIV infection and ART are included as risk factors for Osteoporosis and fragility fractures by National Osteoporosis Foundation in US<sup>2</sup>. In our country, not many reports are available in this regard. The present article reports two HIV + patients of different age group, on ART for variable periods, who developed bilateral fracture neck femur without any trauma. The cases were managed suitably and are being reported due to its rarity and to stress the need of careful evaluation in HIV+ patients.

### Case Reports:

**Case 1:** A HIV+ male patient of age 37 years on regular ART presented with pain in his both hips region for 1-year duration without any trauma or fall. X-ray pelvis with both hips showed transcervical minimally displaced fracture neck of both femora. The young patient was managed with multiple cancellous screw fixation in situ and is under regular follow up for 15 months.

**Case 2:** A HIV+ male patient of 65 years under regular ART presented with the complaints of pain right hip with difficulty in walking for 1 month without any trauma. X-ray pelvis showed displaced fracture neck right femur and incomplete fracture of superior cortex of neck left femur. The patient was treated by Austin Moore prosthetic replacement of head femur on right side and observation for the left femur neck incomplete fracture. The case is under follow up and continuing ART also.

**Clinical Message:** Spontaneous non- traumatic fracture should be suspected in HIV + patients having persistent localized pain in an area even without history of any trauma or classical features of fracture on physical examination. Radiological examination must be carried out before excluding fracture.

**Keywords:** HIV, Anti Retro viral Therapy, Fracture Neck Femur.

### Case Reports

#### Case 1

A 37 years old male, a known case of HIV+ infection on regular anti-retroviral therapy for five years presented in orthopedics service with the chief complaints of pain in both hip areas with difficulty in walking for 1 year without any history of trauma or fall. Pain was insidious in onset, dull aching in nature, non-radiating, continuous and slow progressive. Pain had become more severe for the last 3 months and caused difficulty in walking. On examination, the patient was thin built, without pallor and without any abnormalities on general and systemic examination. The lower limbs were having minimal external rotation, tenderness on both hips, slight shortening on right side and difficulty in standing on each lower limb independently with full weight bearing. X-ray pelvis with both hips showed minimally displaced trans-cervical fracture neck both femora (Fig. 1). His Hb was 13.1 gm%, alkaline phosphatase 871 IU, serum calcium 9.4 gm%, Random blood sugar 71 mg%, LFT & KFT were within normal limits, serum Vitamin D3 98.5 and HBS AG non-reactive.

The patient was managed with multiple cannulated cancellous screw fixation of both the fractures in one sitting under C-arm imaging evaluation. Post-operative x-ray showed adequate and stable fixation of neck femur in both AP and lateral views. The patient was permitted partial weight bearing with walker one month

after surgery. At 1 year follow up (Fig. 2) he is asymptomatic, walking unaided and continuing ART regularly.



**Fig. 1:** X-ray Pelvis with both hips AP view of case 1 showing minimally displaced sub-capital fracture of neck both femur



**Fig. 2:** Post-operative 6 months follow up x-ray pelvis frog leg view of case 1 showing 3 cancellous screws on each side fixing the fracture in acceptable alignment and in uniting stage

## Case 2

A 65 years old male on regular antiretroviral therapy for two & half years, presented with the complaints of pain and difficulty in weight bearing on right lower limb for 1 month without any history of trauma or fall. Pain started spontaneously in an insidious way, increased on walking and progressed to a level that the patient had to take support of a stick for walking during the last two weeks. Examination revealed right lower limb in external rotation, tenderness on anterior joint line, positive telescoping and supra trochanteric shortening of 1 cm. in right femur. X-ray pelvis (Fig. 3) showed displaced transcervical fracture neck right femur and incomplete fracture in superior part of neck of the left femur. The investigations reports were Hb 10.9 gm%, alkaline phosphatase 630 IU, KFT, LFT, serum glucose, & serum electrolytes were within normal limits, and HBS AG & HCV non-reactive. The patient wanted treatment only on the right side, hence he was managed with Austin Moore Replacement of Head femur right side (Fig. 4). Post-operative period passed uneventfully and he was permitted partial weight bearing with walker in view of incomplete fracture on left femur neck. He was informed about the need of regular calcium, vitamin D3 and supportive drugs besides ART and was explained the possible need of surgery on the left hip also. He continues to be under follow up.



**Fig. 3: X-ray pelvis with both hips AP view of case 2 showing displaced transcervical fracture neck right femur with incomplete sub-capital fracture neck left femur**



**Fig. 4: Post-operative x-ray pelvis of case 2 showing Austin Moore Prosthesis on right side and incomplete sub-capital fracture neck femur on left side**

## Discussion

The prognosis of HIV infection is dramatically transformed due to the success of antiretroviral therapy from a fatal disease to a manageable chronic disease. Many studies have highlighted the role of ART in HIV, and Hepatitis C virus co-infection with bone mineral density (BMD) loss and fracture incidence.<sup>3</sup> Some clinicians have reported a premature phenotype in HIV+ persons having therapy related metabolic complications such as frailty, hyperlipidemia, diabetes mellitus, osteoporosis and related fractures.<sup>4,5</sup> Low BMD has been noted as a frequent complication of HIV infection and /or its treatment.<sup>1,6,7</sup> Multiple studies have shown that HIV infected persons have higher rates of bone fractures.<sup>8</sup> With the initiation of ART, there is a drop in BMD over the first 48 to 96 weeks. This drop is mediated by an acceleration of bone turnover with activation of osteoblasts and favour of osteoclast activity.<sup>9</sup> This effect is related to the specific ART used. Tenofovir disoproxil fumarate (TDF) has been found to cause larger decrease in BMD than other nucleoside analog regimen.<sup>10,11</sup>

Failure to reach peak BMD is commonly cited as a cause in persons who become HIV infected before the age of 30. Interestingly low BMD was seen only in male sex.<sup>12,13</sup> The association between the severity of HIV disease and lower BMD is also established.<sup>14</sup> Due to the effects of ART on BMD, HIV infection and ART are included as risk factors for osteoporosis and fragility fractures.<sup>2</sup> A nearly 2 to 3 folds increase in fracture rates were identified among HIV patients.<sup>15</sup> Occult spinal fractures in 30% of HIV infected persons in comparison to 4% of the uninfected persons has also been demonstrated.<sup>16</sup> ART initiation is supposed to induce a 2-6% loss in BMD and leaves the patient susceptible to fractures.<sup>1</sup> The mechanisms causing bone loss are complex and unclear but we should take a proactive approach to prevention to minimize bone loss and morbidity associated with osteoporotic non-traumatic fractures occurring in HIV+ patients.<sup>17</sup>

Both the patients reported in this study were taking treatment as per National HIV/AIDS Control Programme for the last 5 years and 2.5 years, respectively for case 1 and case 2. They were daily taking a film coated tablet, containing Tenofovir Disoproxil Fumarate IP 300 mg, Lamivudine IP 300 mg, and Efavirenz IP 600 mg. They were following up with the regional ART Centre for regular supply and feedback regarding their symptoms and signs. Both the patients did not have any trauma and felt the bone disease as pain in the initial period which was treated by analgesics by the local practitioners. As the problem increased and caused the patient difficulty in weight bearing and ambulation, orthopedic consultation was taken and the diagnosis and proper management could be done. Both the patients had serum alkaline phosphatase value raised (871 IU in case 1 and 630 IU in case 2) indicating higher bone turnover related to

osteopenia and increased osteoblast activity. As the patients are still continuing with the ART regimen, containing Tenofovir Disoproxil Fumarate, the possibility of further fractures in future cannot be excluded. The study of x-ray (Fig. 3 & 4) in case 2 shows incomplete fracture in the neck femur on the left side, which is still asymptomatic. This demonstrates that the fractures start as minor crack and proceed with the passage of time to become complete and later on displaced. Thus, there is a need of education of the patient on ART about the possibility of fracture within a year of starting ART and about the need of calcium and vitamin D supplementation as a prophylactic measure. Besides, a radiological examination of pelvis, spine and symptomatic area be done at least once in a year. In elderly patient, senile osteoporosis becomes an added factor. The policy makers deciding ART also need to be aware of these complications of low bone mineral density, and non-traumatic fractures in hip & spine so that remedial steps could be taken right from beginning. More study is required in our country to know about its incidence and bones involved.

#### Clinical Message

A clinician should be aware of the possibility of non-traumatic fractures in HIV+ patients on Retroviral Therapy for nine months or more. Complaints of such patients should be thoroughly evaluated and investigated to provide timely treatment and avoid long term disabilities.

**Funding:** No funding sources.

**Conflict of interest:** None declared.

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**How to cite this article:** Dhaniwala N., Dhaniwala M., Jadhav M., Dasari V. Non-traumatic fracture neck bilateral femur in patients on Anti-retroviral therapy. *IP Int J Orthop Rheumatol* 2018;4(2):80-2.