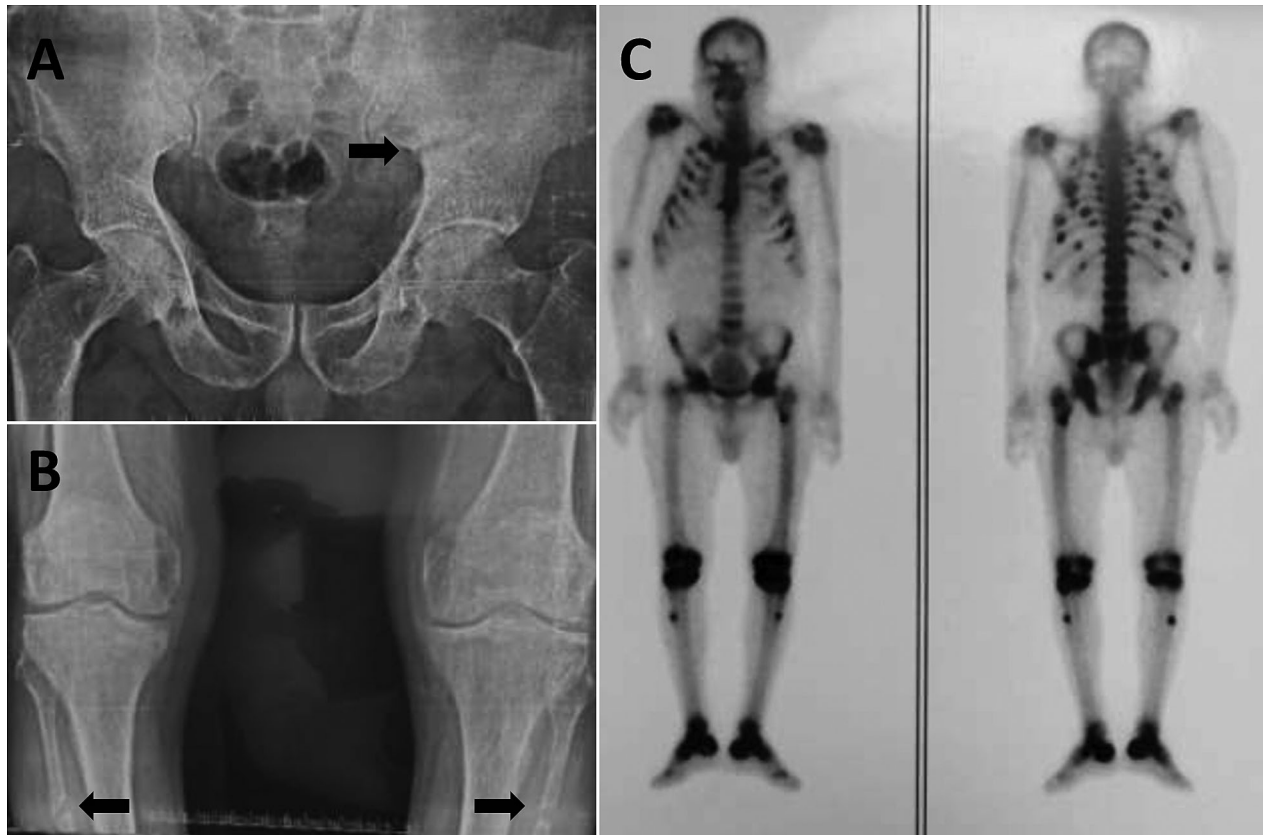


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### Clinical Images: Tenofovir-Induced Fanconi Syndrome: An Uncommon Cause of Hypophosphatemic Osteomalacia




**Figure 1.** Tenofovir-induced osteomalacia. Plain radiographs of pelvis (A) and both knees (B) antero-posterior view showing insufficiency fractures involving left ilium and bilateral proximal fibulas (arrows). 99m Tc-methylene diphosphonate Whole Body Scintigram, anterior (left panel) and posterior (right panel) views (C) revealed multiple foci of increased tracer uptake involving epiphyseal ends of head of bilateral humeri, multiple ribs, proximal shaft of left femur and bilateral tibia, distal ends of bilateral femur, proximal and distal ends of bilateral tibia, and dorsal bones of bilateral feet.

The patient, a 62-year-old wheelchair-bound male who had been taking antiretroviral therapy for 12 years, presented with lower limb proximal muscle weakness and bony pains for 1.5 years. An examination revealed an inability to bear weight on the left lower limb and muscle weakness. Prior evaluation for myopathy was unremarkable, with normal muscle enzymes and muscle biopsy. Thyroid profile and blood sugar were normal. Investigations revealed low phosphate level, raised alkaline phosphatase level, and normal calcium, 25(OH) vitamin D, and parathormone levels. Serum potassium was low with a transtubular potassium gradient of 31; urine examination showed proteinuria and glycosuria, and serum creatinine was raised. Arterial blood gas analysis revealed pH 7.36 with normal bicarbonate and  $p\text{CO}_2$ . Plain radiographs of pelvis and knees showed insufficiency fractures involving the left ilium and bilateral fibula (Figure 1A and B). 99m Tc-methylene diphosphonate bone scintigraphy revealed multiple areas of increased tracer uptake involving long bones of bilateral lower limbs, multiple rib fractures, and insufficiency fractures in bilateral proximal fibulas and the left femur, suggestive of metabolic bone disease (Figure 1C). Insufficiency fractures—also called Looser’s zones—are characterized radiologically by wide, transverse lucencies with sclerotic margins perpendicular to the involved cortex, often partially traversing through the bone. Bilateral symmetrical involvement of the axillary border of the scapulae, posterior ulnae, or ribs usually favors a diagnosis of osteomalacia. Besides, the superior and inferior pubic rami and the proximal medial aspects of femora are also involved. A diagnosis of tenofovir-induced proximal tubular acidosis with osteomalacia was entertained, and tenofovir was stopped. Tenofovir nephrotoxicity includes proximal renal tubular acidosis with or

without renal injury (1). Fanconi syndrome is characterized by proteinuria, glycosuria, acidosis, and hypophosphatemia manifesting as osteomalacia, consequent to proximal renal tubular dysfunction. A timely withdrawal of the inciting drug results in reversal of osteomalacia.

*Author disclosures are available at <https://onlinelibrary.wiley.com/action/downloadSupplement?doi=10.1002%2Facr2.11415&file=acr211415-sup-0001-Disclosureform.pdf>.*

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