

## Case Report

# Spontaneous bilateral femoral neck and left scapula fracture in a young adult with end-stage renal disease

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## ABSTRACT

Renal osteodystrophy is not uncommon in chronic kidney disease patients however fractures are not common among these patients. Bilateral spontaneous femoral and scapular fractures due to renal osteodystrophy are extremely uncommon. We report a case of spontaneous bilateral femoral neck fracture and left scapular neck fracture associated with secondary hyperparathyroidism in a patient of end-stage renal disease.

**Keywords:** Chronic kidney disease, Renal osteodystrophy, Secondary hyperparathyroidism

## INTRODUCTION

Fractures are common among chronic kidney disease (CKD) patients on dialysis. Patients with CKD G3a-G5D have a greater risk of fracture than the general population. CKD patients with age over 65 years of age exhibit a high rate of fractures, with 1 in 20 males and 1 in 10 females experiencing at least one fracture after three years of follow-up.<sup>1</sup> Fracture neck of the femur in elderly dialysis patients has been well documented. However, spontaneous fracture in young adults secondary to hyperparathyroidism is unusual.

Here, we report a case of a young adult with bilateral spontaneous fractures of the neck of the femur, and scapula in a patient of CKD.

## CASE REPORT

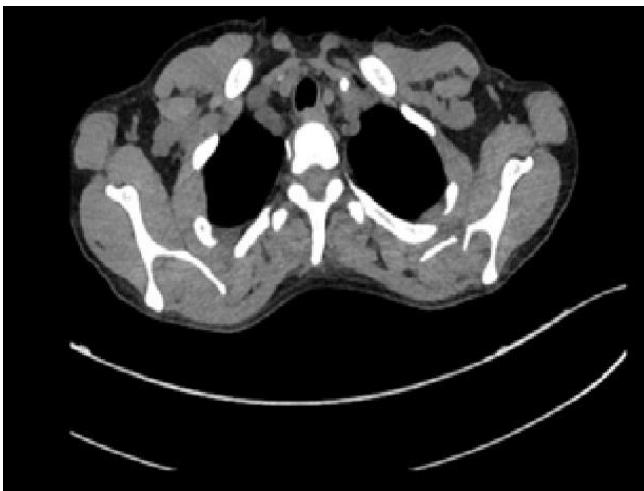
A 32-year-old female was a known case of polycystic kidney disease since 2013. She is non-diabetic and does not have any history of hypertension. She was started on maintenance hemodialysis in 2016 and was continued for one and half years. The patient discontinued dialysis in 2017. The patient presented to emergency with complaints of being unable to walk for ten days, fever,

and shortness of breath for three days. There was no history of trauma. She denied the use of the steroid. She had poor sensorium at presentation. Her blood pressure was 80/60 mm Hg. On examination, bilateral limbs were externally rotated and power was 0/5, b/l planters were flexor, rest of the systemic examination was normal. She was put on a mechanical ventilator and started on inotropic support. Investigations showed leucocytosis {total leucocyte count-17000/cumm (Neutrophils-89%)}, anemia (Hb-8 gm/dl) with normal platelet count. Her blood urea and serum creatinine were 385 mg/dl and 11.94 mg/dl respectively. She was having hypocalcemia (Ca-6.88 mg/dl), and hyperphosphatemia (Phosphorus-6.12 mg/dl). Her vitamin D level was low (7.60 ng/ml) and her intact parathyroid hormone level was high (1536 pg/ml). Ultrasound abdomen showed bilaterally enlarged kidneys (right kidney 14x6 cm and left kidney 15.65x 5.57 cm) with multiple cysts. Her blood culture and urine culture were sterile. CT pelvis with the whole spine showed fractures in the left scapula, and bilateral proximal femur as shown in Figure 1 and 2. Skin traction was given for bilateral femur fracture. She was managed with intravenous antibiotics, phosphate binders, calcium and vitamin D supplements, and intensive hemodialysis sessions. Inotropes were gradually tapered over 48 hours and extubated on the third day of admission.

Subsequently, she was discharged and advised to continue hemodialysis.



**Figure 1: CT scan (axial view) of bilateral femoral fractures.**



**Figure 2: CT scan (axial view) of bilateral fracture of scapula on the left side.**

## DISCUSSION

A femoral neck fracture is unusual in young patients and is usually associated with high-energy trauma. Fracture risk is more in end-stage kidney disease (ESRD) as compared to predialysis patients. Kwon et al in their observational study showed that dialysis patients have a 16% higher risk than those without dialysis.<sup>2</sup> Patients with a glomerular filtration rate (GFR) of less than 60 ml/min have a two-fold increased risk of hip fracture, according to the national health and nutrition examination survey. Patients with ESRD have 4-14 times the rate of hip fractures as the general population.<sup>3</sup> Runesson et al conducted a study on 68764 CKD patients, during a 2.7

year median follow-up, 13% of patients had fractures out of which hip fracture was found in 33% of patients and adjusted HR was 1.10 (95% CI 1.02-1.19), 1.32 (1.17-1.49), and 2.47 (1.94-3.15) for CKD stage 3b, 4 and 5, respectively, as compared to CKD stage 3a.<sup>4</sup> Our patient was also having ESRD which prone our patient to fracture risk.

Fracture risk factors in CKD patients are similar to those in the general population, such as low body weight, familial osteoporosis, steroid usage, chronic inflammatory diseases, and menopause.<sup>5</sup> In our patient, none of the above-mentioned risk factors were found.

The risk factors and prognosis of fractures in dialysis patients remain unknown. A retrospective case-control study by Xie et al revealed diabetes, essential hypertension, high serum calcium, alkaline phosphatase levels, and low intact parathyroid hormone were associated with increased fracture risk and in patients with ESRD, a fracture was an independent predictor of all-cause death.<sup>6</sup>

The study of the etiological factors is essential since they will guide us about the best options of treatment. A retrospective analysis of 26 pathological fractures in 17 chronic hemodialysis patients with a mean age of 61 years found beta-2 micro-globulin, amyloid, aluminic, osteomalacia, hyperparathyroidism, and cortisone as etiological causes for increased fracture risk. Amyloidosis remains the most frequent etiological factor in that study.<sup>7</sup>

Our patient is young, non-obese with no history of any trauma, and family history suggests that underlying renal dysfunction may be the reason for femoral and scapula fracture.

## CONCLUSION

Fractures are rare in young CKD patients. Spontaneous bilateral femoral and scapula fractures are even rare without any history of trivial injury, previous steroid use, and high-stress activities. We report a young patient who presented with a bilateral spontaneous femoral and left scapula fracture with no history of precipitating factors. On evaluation she was found to have severe secondary hyperparathyroidism which is supported by her laboratory findings like low vitamin D levels, hypocalcemia, and high parathyroid levels, indicating. Patients had severe vitamin D deficiency which is common in India can be attributed to malnutrition, clothing style, and low sun exposure. Although fracture is very rare in young CKD patients, we should consider it in a patient who presented with a sudden loss of mobility of lower limbs.

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