Bilateral Femoral Neck Fracture-Related Hyperparathyroidism

Abstract

Bilateral femoral neck fracture is not as common as unilateral femoral fracture. Femoral neck fracture generally occurs due to high energy trauma. Traffic accidents and falls are the most common reason for this fracture kind. But suddenly and minor traumatic fractures is not common. Especially, in the hormonal and pathogenic fractures is not common. In this case a minor traumatic bilateral femoral fracture is presented. The fracture occurs in the background of critical medical condition by hyperparathyroidism. It can be said chronic hyperparathyroidism conditions must be determined for femoral neck fracture. Because these patients many times fell little disturbed by this fracture, diagnosis can be missed many times.

Key Words: Bilateral, Femoral neck fracture, Hyperparathyroidism

Introduction

Patients with primary hyperparathyroidism are often asymptomatic, with diagnosis occurring only after incidental findings of hypercalcemia [1]. Medial and peritrochanteric fractures of the femoral neck occur commonly in patients with bone weakness due to osteoporosis or osteomalacia. Combined bilateral hip injury is much rarer [2]. Here we report the case of a young woman with bilateral femoral neck fractures. She had experienced pain in her groin area for the previous six months, with sharp pain lasting for a few days at a time. The patient, a middle-aged (38 years) woman from northern Erzurum, presented with a florid but uncommon case of severe bone pain and bilateral femoral neck fractures [1].

Case Report

A woman presented with bilateral fractures of the femoral neck due to primary hyperparathyroidism. The patient also had a nutritional vitamin D3 deficiency [2]. Her laboratory values were as follows: calcemia 4.07 mmol/l (2.2-2.6); urinary calcium 31 mmol/24 h (1.25-7.5); parathyroid hormone (PTH) 1 197 pg/ml (10-60); and 25 OH-vitamin D 14 nmol/l (22-120) [3]. The fracture line was vertically oriented near the base of the neck. The diagnosis was suggested by the patient’s history and roentgenologic features and was confirmed by biochemical changes [4]. Fractures were vertical neck or basal neck fractures, corresponding to types II and III of Pauwel’s classification system (J Musculoskelet Neuronal Interact 2009; 9(3):130-137).

Orthopedic operation revealed a solitary parathyroid adenoma that was successfully removed surgically. Postoperatively, the patient had severe symptomatic hypocalcaemia that required aggressive replacement therapy with calcium, magnesium and active vitamin D. She was clinically well and presented significant improvement of biochemical indices on follow-up at 2 months [1].

Discussion

Primary hyperparathyroidism is associated with reduced bone mineral density, mainly at sites rich in cortical bone [5].
In primary hyperparathyroidism, plasma 25-hydroxyvitamin D (25OHD) levels are typically reduced, and plasma 1,25-dihydroxyvitamin D [1,25(OH)(2)D] levels are slightly increased. These variations in vitamin D metabolites may influence variations in bone mineral density and fracture risk [5].

Primary hyperparathyroidism (PHPT) and vitamin D insufficiency are common conditions that can occur in combination. However, low plasma 25-hydroxyvitamin D levels may also enhance the risk of primary hyperparathyroidism or modify disease severity [6].

Vitamin D insufficiency (plasma 25OHD<50 nmol/l) was observed in 81% of PHPT patients compared with 60% of sex- and age-matched controls (p<0.001) and 35% of blood donors (p<0.001). During the summer, 77% vs. 53% (p<0.001) and 4% (p<0.001), respectively, had vitamin D insufficiency. Average plasma 25OHD levels were 41 (range 9-87) nmol/l among 27 PHPT patients compared with 87 (21-173) nmol/l (p<0.001) among aged-matched blood donors. During the winter, 86% vs. 66% (p<0.001) and 71% (p<0.05), respectively, had vitamin D insufficiency. A vitamin D deficiency (plasma 25OHD<25 nmol/l) was observed in 33% of PHPT patients compared with 20% of age- and sex-matched controls (p<0.001) and 13% of blood donors (p<0.001). Both PHPT patients and controls showed seasonal variations in 25OHD related to the average number of sun hours, but values were lower in PHPT patients during all calendar months. In PHPT patients, low plasma 25OHD levels are associated with higher plasma levels of calcium, PTH and alkaline phosphatase and with lower renal calcium excretion, femoral Bone Mineral Density BMD, neck BMD and forearm BMD. No association was found between plasma 25OHD and adenoma weight (total or divided in tertiles). There was a trend toward increased risk of osteoporotic fractures (p<0.08) with low plasma 25OHD levels [6].

In conclusion, vitamin D insufficiency and deficiency are common findings in primary hyperparathyroidism and occur more often than in a sex- and age-matched control group referred from general practice or in normal blood donors, irrespective of the season. Low plasma 25OHD levels are associated with an aggravated clinical presentation of primary hyperparathyroidism but do not affect adenoma size [6].

Low vitamin D status and high plasma 1,25(OH)(2)D are associated with increased bone turnover and decreased bone mineral density in patients with primary hyperparathyroidism [5].

Although conflicting findings have been reported, bone loss has been noted in patients with primary hyperparathyroidism, especially at cortical skeletal sites. Medical management does not seem to be associated with increased morbidity or mortality in patients with asymptomatic primary hyperparathyroidism. Bone densitometry is advised in patients with primary hyperparathyroidism, particularly for monitoring of bone mass at the midradius or femoral neck [7]. This patient was not postmenopausal, and presented evidence that fails to support the assertion of published reports [8] that other factors, such as bone quality, are relevant in determining fracture risk, especially when gonadal function is lacking.

Patients such as this one with asymptomatic conditions must be observed for other internal symptoms to decrease the risk of fracture.

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References


