



NUTRITIONAL OSTEOMALACIA PRESENTING AS NOCTURNAL LEG PAIN AND DIFFICULTY IN WALKING IN AN ADOLESCENT FEMALE

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ABSTRACT

Osteomalacia is a metabolic bone disease caused by defective mineralization of osteoid, most commonly due to vitamin D deficiency. It often presents with nonspecific symptoms leading to delayed diagnosis. We report a case of a 17-year-old unmarried female presenting with nocturnal leg pain and difficulty in walking. Radiographs revealed bowing of the femur with osteopenic changes. Biochemical evaluation showed severe vitamin D deficiency (25-hydroxy vitamin D: 6.87 ng/mL), hypocalcemia (serum calcium: 7.6 mg/dL), and markedly elevated parathyroid hormone levels (iPTH: 318.9 pg/mL), consistent with secondary hyperparathyroidism. The patient was diagnosed with nutritional osteomalacia and treated with vitamin D and calcium supplementation, resulting in significant clinical improvement. This case highlights the importance of early metabolic evaluation in adolescents presenting with chronic bone pain.

KEYWORDS : Osteomalacia; Vitamin D deficiency; Hypocalcemia; Secondary hyperparathyroidism; Femoral bowing

INTRODUCTION

Osteomalacia is characterized by impaired mineralization of bone matrix due to deficiency of vitamin D or disorders of calcium and phosphate metabolism. Although commonly seen in elderly populations, it is increasingly recognized among adolescents and young adults due to nutritional deficiencies, limited sunlight exposure, and lifestyle changes. Clinical manifestations are often subtle and include bone pain, muscle weakness, and gait disturbances, leading to delayed diagnosis. Early identification is crucial to prevent skeletal deformities and fractures.

CASE REPORT

A 17-year-old unmarried female presented to the outpatient department with complaints of progressive bilateral leg pain for several months, predominantly worsening at night, associated with difficulty in walking. There was no history of trauma, fever, weight loss, joint swelling, or neurological symptoms. The patient had been taking over-the-counter analgesics intermittently, which provided only temporary relief.

There was no significant past medical or family history. Menstrual history was normal. Dietary assessment revealed inadequate intake of calcium-rich foods along with limited exposure to sunlight. On physical examination, the patient had an antalgic gait with tenderness over the thigh region. No swelling or local signs of inflammation were present. Muscle power was mildly reduced due to pain. Vital signs were within normal limits.

Plain radiographs of the thigh and knee joint demonstrated bowing of the femoral shaft with diffuse osteopenia, suggestive of a metabolic bone disorder rather than a traumatic pathology (Figure 1).

Laboratory Investigations:

Biochemical evaluation revealed severe vitamin D deficiency (25-hydroxy vitamin D: 6.87 ng/mL), hypocalcemia (serum calcium: 7.6 mg/dL), serum phosphorus of 3.96 mg/dL, and markedly elevated intact parathyroid hormone levels (318.9 pg/mL), consistent with secondary hyperparathyroidism.

Based on the clinical presentation, radiological findings, and biochemical abnormalities, a diagnosis of nutritional osteomalacia with secondary hyperparathyroidism was established.

Management And Outcome:

The patient was initiated on high-dose vitamin D3 supplementation along with oral calcium. Dietary counseling focusing on calcium-rich foods and advice regarding

adequate sunlight exposure were provided. Analgesics were gradually discontinued. On follow-up, the patient reported significant reduction in nocturnal pain and improvement in gait and functional mobility.

DISCUSSION

Vitamin D deficiency results in reduced intestinal absorption of calcium, leading to hypocalcemia and a compensatory rise in parathyroid hormone levels. Secondary hyperparathyroidism increases bone turnover and impairs mineralization, resulting in osteomalacia. Classical symptoms include nocturnal bone pain, proximal muscle weakness, and difficulty in walking. The markedly low vitamin D level, hypocalcemia, and significantly elevated iPTH observed in this patient strongly support the diagnosis. Radiographic features such as femoral bowing and osteopenia further corroborate the metabolic etiology. Early diagnosis and appropriate supplementation result in excellent clinical outcomes and prevent long-term skeletal deformities.

CONCLUSION

Nutritional osteomalacia should be considered in adolescents presenting with chronic nocturnal bone pain and difficulty in walking. Prompt biochemical evaluation and radiological correlation are essential for early diagnosis and effective management.

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Figure Legend



Figure 1: Plain X-ray of the femur showing bowing deformity with diffuse osteopenia, suggestive of osteomalacia.

Declarations

Patient Consent: Written informed consent was obtained from the patient and her guardian for publication of this case report and accompanying images.

Conflict Of Interest: None declared.

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