Case Report

An uncommon cause of osteoporosis

Rohit Barnabas[1], Basavaraj Soora Gauda[1], Kripa Elizabeth Cherian[1], Nitin Kapoor[1], Hesarghatta Shyamasunder Asha[1], Thomas Vizhalil Paul[1]

[1]*Department of Endocrinology, Diabetes and Metabolism, Christian Medical College and Hospital, Vellore, Tamil Nadu, India*

Abstract

Osteoporosis in the younger age group is an important cause of morbidity. Prolactinoma is an uncommon but reversible cause of osteoporosis. The main mechanisms of osteoporosis in prolactinoma are reduced osteoblast activity and hypogonadism. A high index of suspicion is the key in diagnosis and management of this treatable entity.

Keywords: Hypogonadism, osteoporosis, prolactinoma

Introduction

Osteoporosis in the younger age group is an important cause of morbidity. These participants have to be evaluated for secondary causes. Hyperprolactinemia secondary to prolactinoma is an uncommon cause of osteoporosis in younger age individuals of both sexes. The main mechanism includes hypogonadism, the other mechanism beings inhibition of osteoblasts. A high index of suspicion is the key to diagnosis and management of this readily treatable condition. Here, we report a case of a male patient presenting with osteoporosis secondary to macroprolactinoma.

Case Report

A 44-year-old male referred by primary healthcare physician for the evaluation of noninflammatory back pain of 4-year duration. There was no history of trauma or use of medications such as glucocorticoids and selective serotonin reuptake inhibitors (SSRIs). He had complained of reduced libido and erectile dysfunction for the past 2 years. He did not have radiculopathy, bowel, or bladder involvement. His visual field assessment and optic fundi were normal. His testicular volumes were 15 mL bilaterally with adult penile size and pubic hair Tanner stage 4. There was mild tenderness over the lumbar spine on deep palpation. Magnetic resonance imaging (MRI) of the lumbar spine showed diffuse osteopenia with anterior wedge compression involving lumbar vertebrae [Figure 1]. Blood biochemistry showed an albumin-corrected calcium of 9.7 mg/dL (*n*: 8.3–10.4), phosphorus of 4.4 mg/dL (*n*: 2.5–4.6), 25 hydroxy Vitamin-D of 21.5 ng/ml (*n*: 30–75), and parathyroid hormone of 74.4 pg/ml (*n*: 8–74); serum electrophoresis showed a normal pattern, liver and renal functions were normal. His hormonal evaluation showed markedly elevated prolactin of 2692.9 ng/ml (*n*: 2.5–17), low 8 am testosterone of 127 ng/dl (*n*: 300–1030), thyroid-stimulating hormone of 0.845 μIU/ml (*n*: 0.3–4.5), free T4 of 1.2 ng/dL (*n*: 0.8–2), luteinizing hormone (LH) of 2.8 IU/L, follicular stimulating hormone (FSH) of 1.93 IU/L, and serum cortisol 8 am was 16.5 μg/dL (*n*: 10–25). Bone mineral density assessed using a dual-energy X-ray absorptiometry (DXA) scan showed osteoporosis at lumbar spine with a *Z*-score of − 3 [Figure 2]. MRI of the brain through the pituitary showed a sellar mass with suprasellar extension invading into the cavernous sinus on the right side with a size of 23 mm × 17 mm × 20 mm [Figure 3]. Thus, this patient had macroprolactinoma with secondary hypogonadism causing osteoporosis and fracture. There was the preservation of thyrotrophic and corticotrophic axis. The

Address for correspondence: Dr. Thomas Vizhalil Paul, Department of Endocrinology, Diabetes and Metabolism, Christian Medical College, Vellore - 632 004, Tamil Nadu, India.
E-mail: thomasvpaul@yahoo.com

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Figure 1: Magnetic resonance imaging sequence of lumbar vertebrae showing mild anterior wedge compression

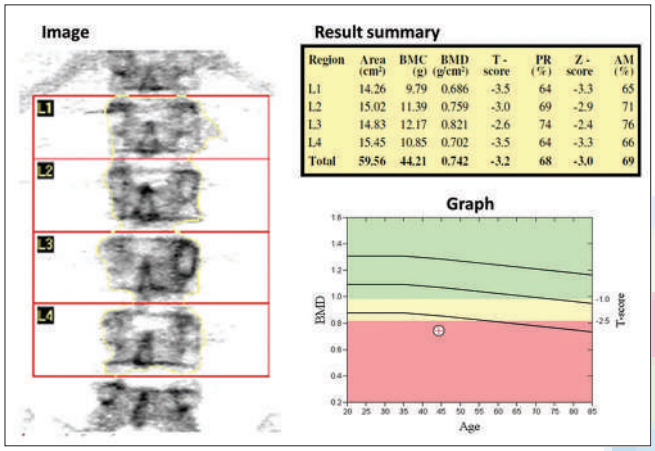

Figure 2: Bone mineral density of the lumbar vertebra with *T*-score of −3.2 and *Z*-score of −3

Figure 3: Magnetic resonance imaging of the pituitary showing macroadenoma with a size 23 mm × 17 mm × 20 mm

patient was initiated on oral cabergoline 0.5 mg twice weekly and scheduled for a follow-up after 3 months. He was also started on cholecalciferol and calcium supplementations and planned for parenteral bisphosphonate therapy, on the next follow-up.

Discussion

The patient had hypogonadism secondary to macroprolactinoma which resulted in osteoporosis and vertebral fractures. Osteoporotic fractures are a leading cause of morbidity and mortality among aging men. The most common cause of osteoporosis in men is hypogonadism, other causes being cigarette smoking, alcohol, drugs such as corticosteroid use, SSRI, anticonvulsant, and gastrointestinal diseases. Prolactinoma is an uncommon cause of osteoporosis.[1] The main mechanism of osteoporosis in hyperprolactinemia is hypogonadism. There is an alteration in the normal GnRH pulsatile secretion leading to a reduction of estrogen in women and testosterone in men, thereby causing low bone mass.[2] Prolactin has also a direct suppressive effect on the osteoblast and increases the apoptosis. There is a reduction in the intracellular calcium content which could contribute further to osteoporosis.[3] A high prevalence of radiological vertebral fractures in women with prolactin-secreting pituitary adenomas has been reported.[4] Most patients with prolactinomas respond well to treatment with cabergoline and reversal of hypogonadism usually occurs. This case highlights the need for proper evaluation in men presenting with osteoporosis.

Conclusion

Prolactinoma is an uncommon but important treatable cause of osteoporosis, especially in younger age group. High prolactin level by suppressing the gonadotrophic hormones (FSH and LH) can result in hypogonadism. Low sex hormones (testosterone or estrogen) secondary to hypogonadism may have a significant adverse impact on bone resulting in osteoporosis predisposing them to fragility fractures. Thus, a high index of suspicion is the key to the diagnosis of this potentially treatable condition in patients of younger age group when they present with fragility fractures in a primary care setting. This case highlights the importance of evaluating individuals for secondary causes of osteoporosis and many of them present to a family physician or general practitioner with a common symptom like back pain.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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