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Hypoglobulinemia and Nonsecretory Myeloma as a Rare Cause of Osteoporosis in a Young Man

Genç Bir Hastada Nadir Osteoporoz Sebebi Olarak Hipoglobulinemi ve Nonsekretuvar Miyeloma

Kevser Onbaşı, Nur Kebapçı*, Aysen Akalın*, Belgin Efe*, Havva Üsküdar**

Dumlupınar University Faculty of Medicine, Department of Endocrinology and Metabolism, Kütahya, Turkey
*Osmangazi University Faculty of Medicine, Department of Endocrinology and Metabolism, Eskişehir, Turkey
**Osmangazi University Faculty of Medicine, Department of Hematology, Eskişehir, Turkey

Abstract

A 27-year-old man was admitted to our hospital with the complaint of back pain. Bone mineral density evaluation revealed severe osteoporosis. The causes for secondary osteoporosis, such as thyrotoxicosis, glucocorticoid therapy, hypercortisolemia, hypercalciuria, and hyperparathyroidism were excluded. Laboratory examination revealed hypoglobulinemia. Further evaluation of the immunoglobulin levels was compatible with panhypoglobulinemia. The patient's vitamin D level was also low. The patient was first suspected of having a common variable immune deficiency, but he had not not experienced frequent infections. By carefully evaluating his chest x ray, a lytic lesion in his left humerus was observed. He did not have anemia and elevated sedimentation rate was not observed. Protein electrophoresis showed hypoglobulinemia. Haematology consultation was requested and a bone marrow aspiration was performed. Bone marrow examination revealed multiple myeloma with a myeloma cell increase of 70 to 80%. The patient was diagnosed as having nonsecretory myeloma which explained his hypoglobulinemia. Myeloma may cause severe osteoporosis, pain and hypercalcemia. A chemotherapy regimen (vincristine, adriablastina, dexamethasone) was initiated and further autologous stem cell transplantation was planned. The patient had also chromosome 13 abnormality. Osteoporosis at a young age especially in young men should always be extensively evaluated.
Keywords: Osteoporosis, nonsecretory myeloma, hypoglobulinemia

Öz

Yirmi yedi yaşında erkek hasta hastanemize sırt ağrısı ile müracaat etti. Kemik mineral dansite incelemesinde şiddetli osteoporoz mevcuttu. Tirotoksikoz, glukokortikoid tedavi, hiperkortizolemi, hiperkalsiüri, hiperparatiroidizm gibi ikincil osteoporoz sebepleri dışlanıldı. Laboratuvar incelemesinde hastada hipogamaglobulinemi tespit edildi. İmmünoglobulin gruplarının daha ileri incelenmesinde hastada panhipogamaglobülinemi tespit edildi. Hastanın D vitamini düzeyi de düşüktü. Hastada ilk bulgularla sık değişken immün yetmezlik düşünüldü, fakat hastanın sık enfeksiyon geçirme öyküsü yoktu. Akciğer filminin ayrıntılı incelenmesinde sol humerusunda bir litik lezyon tespit edildi. Hastanın anemisi yoktu, sedimentasyon hızı normaldi. Protein elektroforezinde hipoglobulinemi mevcuttu. Hematoloji konsültasyonu istenildi ve kemik iliği aspirasyonu yapıldı. Kemik iliğinde miyelomayı destekleyecek %70 ile 80 oranında miyelom hücrelerinde artış gözlendi. Miyeloma osteoporoz, ağrı ve hiperkalsemiye neden olabilir. Kemoterapi (vinkristin, adriablastin, dexametazon) başlandı ve otolog kök hücre nakli planlandı. Hastada ayrıca kromozom 13 anomalisi saptandı. Genç yaşta ve özellikle erkek bir hastada osteoporoz saptanınca mutlaka ayrıntılı inceleme yapılmalıdır.
Anahtar kelimeler: Osteoporoz, nonsekretuvar miyeloma, hipoglobulinemi

Introduction

Osteoporosis is a major public health concern. It is a common skeletal disease characterized by low bone strength and increased risk of fracture. Fractures are associated with adverse outcomes including acute and chronic pain, diminished quality of life disability, high risk of future fractures, increased mortality, and substantial healthcare expenses (1). Gender, age and race are important risk factors for osteoporosis. Certain medications (in particular glucocorticoids) and various medical conditions, such as renal failure, hypogonadism, hyperparathyroidism, malabsorption, alcoholism, and multiple myeloma (MM) are important secondary causes of osteoporosis (2).

Case Report

A 27 year-old-man was admitted to our hospital with pain in the back. Bone mineral density evaluation revealed severe osteoporosis at L1-L4 vertebra (T score: -4.01) as well as on femur. Causes of secondary osteoporosis, such as thyrotoxicosis, glucocorticoid

Address for Correspondence: Kevser Onbaşı MD, Dumlupınar University Faculty of Medicine, Department of Endocrinology and Metabolism, Kütahya, Turkey
Phone: +90 222 293 29 79 E-mail: kevseronbasi@yahoo.com **Received:** 08/01/2015 **Accepted:** 27/09/2015

therapy, hypercortisolemia, renal failure, hypercalciuria, hyperparathyroidism were excluded. Deoxipyridinium level was 11.8 nMDP/mMKr (N: 2.3-5.4), and osteokalsin level was 5 ng/mL(N: 3.1-13.7). Laboratory examination revealed hypoglobulinemia. Further evaluation of the immunoglobulin (Ig) levels were compatible with panhypoglobulinemia [(Ig G: 223 mg/dL (751-1560); Ig A: <6.67 mg/dL (82.0-453); IgM: <4.17 (46.0-304); IgG1: 173; IgG2: 120; IgG3: 26.8; IgG4: 7.10). The level of vitamin D (vit D: 4 (25-150)] was also low. The patient was first suspected of having common variable immune deficiency, however, he did not experience frequent infections. By carefully evaluating his chest x-ray, a lytic lesion was observed in his left humerus. He did not have anemia and elevated sedimentation was not detected. Protein electrophoresis showed hypoglobulinemia and serum kappa was 455 (170-370 mg/dL); serum lambda was: 109 (90-210 mg/dl); urinary kappa was: 10.7 (0-0.71 mg/dL); and urinary lamda was <5.00 (0-0.39 mg/dL). The level of ß2 microglobulin was normal. Hematology consultation was requested and a bone marrow aspiration was performed. Bone marrow examination revealed MM with a myeloma cell increase of 70-80% (Figure 1). The patient was diagnosed as having nonsecretory myeloma which explained his hypoglobulinemia. A chemotherapy regimen (vincristine, adriablastina, dexamethasone) was initiated and further autologous stem cell transplantation was planned. The patient had also chromosome 13 abnormality.

Discussion

Osteoporosis in men is less common than in woman and, 50% of cases are associated with an underlying secondary cause. Here, we report the case of a young-aged male patient with osteoporotic vertebral fractures as a rare presenting manifestation of nonsecretory MM. Nonsecretory plasma cell myeloma is characterized by an absence of detectable monoclonal protein in both the serum and urine. It is generally reported to comprise approximately 1% to 5 of all cases of plasma cell myeloma and, because of its rarity, requires a high index of suspicion and bone marrow biopsy to establish the diagnosis (3). Hematologic malignancies may lead to generalized osteoporosis and pathologic fractures, bone pain, and hypercalcemia. MM has the highest incidence of bone involvement of all malignant diseases. It is estimated that 70% of patients with MM present with bone pain, and up to 60% of patients will develop a pathologic fracture during their course (4). The skeletal involvement of MM is a major contributor to the morbidity and mortality associated with MM, and up to 90% of patients will develop generalized osteoporosis or lytic bone lesions (5). Presentation age is generally between 53 and 62 years. Our patient presented at a very young age in comparison to previously reported cases (4).

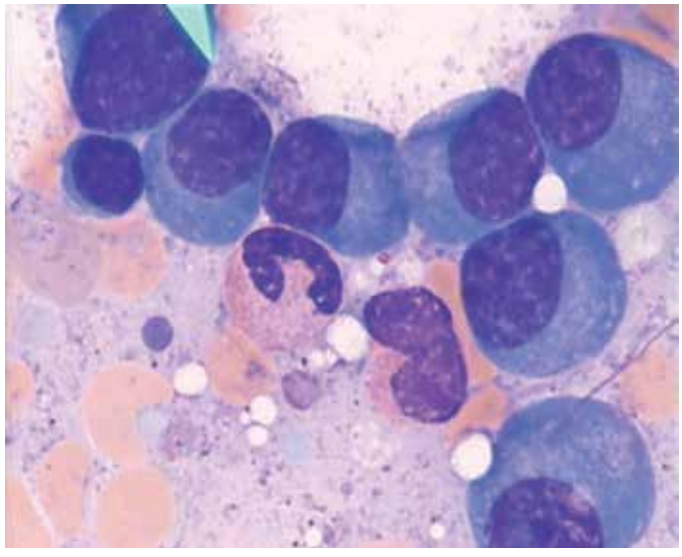

Figure 1. Myeloma cells in bone marrow aspirate

Patients with myeloma may experience hypercalcemia, osteoporosis, pathological fractures, spinal cord compression and severe pain. Osteoclast activating factors, such as like interleukin-6, interleukin-1β, interleukin-3, macrophage inhibitory protein 1 alpha, tumour necrosis factor-alpha, hepatocyte growth factor, and vascular endothelial growth factor activate the nuclear factor kappa B and its ligand. In addition, malignant plasma cells may decrease osteoblast differentiation and function leading to osteoporosis (6).

Our patients' young age, absence of anemia and elevated sedimentation and absence of monoclonal proteins in serum and urine made the diagnosis difficult. The patient had been followed at different clinics for the last two years with the diagnosis of osteoporosis until consulting our department. In summary, nonsecretory myeloma, although rare, should be considered as a cause of idiopathic osteoporosis.

Ethics

Informed Consent: Consent form was filled out by all participitants.
Peer-review: External and Internal peer-reviewed.

Authorship Contributions

Concept: Kevser Onbaşı, Aysen Akalın, Design: Kevser Onbaşı, Nur Kebapçı, Data Collection or Processing: Kevser Onbaşı, Havva Üsküdar, Analysis or Interpretation: Kevser Onbaşı, Literature Search: Kevser Onbaşı, Belgin Efe, Writing: Kevser Onbaşı, Nur Kebapçı, Belgin Efe.
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