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Case Report

세포교정영양요법(OCNT)을 이용한 갑상선기능저하증 동반 골다공증 골밀도 개선사례

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Improvement in Bone Mineral Density in a Patient with Osteoporosis and Hypothyroidism Following Ortho-Cellular Nutrition Therapy : A Case Report

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ABSTRACT

Objective: Osteoporosis is a metabolic bone disease affecting approximately 200 million individuals worldwide. It is characterized by low bone mass, microarchitectural deterioration of bone tissue, increased bone fragility, and an elevated risk of fracture. Undertreatment of patients with osteoporosis remains a significant clinical concern, as many individuals fail to receive appropriate medical management even after being diagnosed with osteoporotic fractures.

Case Report: This case involved a Korean female in her 60s who reported worsening osteoporosis associated with hypothyroidism and menopause. Ortho-Cellular Nutrition Therapy (OCNT), including calcium, vitamin D, collagen, and vitamin C, was administered. As a result, an increase in bone mineral density (BMD) was observed, and the T-score was confirmed to fall within the normal range.

Conclusion: Improvement in bone mineral density was observed following approximately one year of OCNT; however, as this intervention was a personalized prescription applied to a single patient, there are limitations in generalizing the findings to all patients with osteoporosis. Nevertheless, the increase in bone mineral density without notable adverse effects suggests clinically meaningful outcomes, and this case is therefore reported.

Keywords Ortho-Cellular Nutrition Therapy (OCNT), osteoporosis, menopause, calcium, vitamin D

Introduction

Osteoporosis is a metabolic bone disease affecting approximately 200 million individuals worldwide. Although the prevalence of osteoporosis continues to increase, a substantial number of patients remain undiagnosed or do not receive appropriate treatment. This is largely because osteoporosis progresses asymptomatically until a fracture occurs; once fractures develop, patients may experience severe pain, functional impairment, and deformity. Undertreatment of patients with osteoporosis remains a significant clinical concern, as many individuals fail to receive adequate medical management even after being diagnosed with osteoporotic fractures.[1]

Osteoporosis is characterized by low bone mass, microarchitectural deterioration of bone tissue, increased bone fragility, and a consequent increase in fracture risk. The World Health Organization (WHO) has defined osteoporosis based on bone mineral density (BMD) measured by dual-energy X-ray absorptiometry (DEXA). This definition is established using the
T-score, which is calculated from the mean BMD and standard deviation of a young adult population at peak bone mass. A T-score greater than 1.0 is classified as normal, a T-score between 1.0 and 2.5 as osteopenia, and a T-score of 2.5 or lower as osteoporosis. Low bone mineral density is closely associated with an increased risk of fracture. Decreased BMD may result from various factors, including failure to achieve optimal peak bone mass, increased bone resorption leading to bone loss, and insufficient replacement of lost bone due to reduced bone formation.[2]

Osteoporosis can be classified into primary and secondary forms. Primary osteoporosis is further divided into two types:

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type I, postmenopausal osteoporosis associated with menopause or estrogen deficiency, and type II, senile osteoporosis, which occurs in both men and women after the age of 70. Secondary osteoporosis may result from various causes, including medications, endocrine disorders, chronic kidney disease, hematologic disorders, prolonged immobilization, inflammatory joint diseases, nutritional and gastrointestinal disorders, and connective tissue diseases.[3]

Pharmacologic treatment for patients with osteoporosis includes calcium, vitamin D, calcitonin, estrogen, and bisphosphonates. Calcium intake is generally recommended at 1200–1500 mg per day, and vitamin D at 400–800 IU per day in combination with calcium. Higher vitamin D supplementation may be required, particularly in elderly patients with limited sunlight exposure. In patients with vitamin D deficiency, replacement therapy is necessary, and intermittent administration of 50,000 IU of vitamin D may be prescribed as needed. Combined supplementation with calcium and vitamin D has been reported to contribute to the prevention of hip and non-vertebral fractures in older women.[4]

Case Study

1. Subject

This case involved a single patient diagnosed with osteoporosis.

1) Name: Cheon OO (63 years / F)
2) Diagnosis: Osteoporosis
3) Onset: Unknown
4) Treatment period: December 3, 2024 – December 30, 2025
5) Chief complaint: Osteoporosis
6) Past medical history: Hypothyroidism, menopause
7) Social history: None
8) Family history: None
9) Present illness and current medications: None

2. Methods

The following Ortho-Cellular Nutrition Therapy (OCNT) regimen was administered:
- Calmaplex granule (101, twice daily, 1 sachet per dose)
- Collaplex granule (101, twice daily, 1 sachet per dose)
- Diverol F capsule (001, once daily, 1 capsule per dose)
- Aqua SAC pure (001, once daily, 1 sachet per dose)

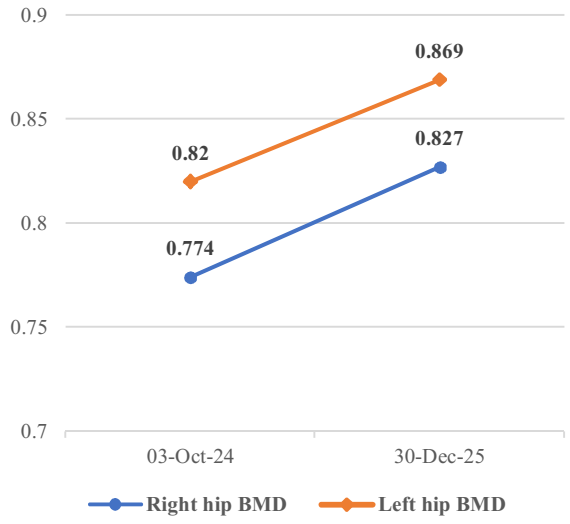
Results

After approximately one year of Ortho-Cellular Nutrition Therapy (OCNT), an increase in bone mineral density (BMD) was observed in this patient. The T-scores were measured at 0.9 for the right hip and 0.6 for the left hip, both of which fell within the normal range. Changes in the patient's bone mineral density are presented in Figure 1.

Discussion

The patient was a 62-year-old postmenopausal female with hypothyroidism. Decreased estrogen levels following menopause are known to shorten the lifespan of osteoblasts and reduce inhibition of osteoclasts, thereby increasing bone resorption and elevating the risk of osteoporosis in postmenopausal women. In addition, due to the nature of her occupation, the patient had repeatedly engaged in activities involving the lifting of heavy objects, after which she visited a hospital and was diagnosed with osteoporosis. The attending physician recommended treatment with bisphosphonate-class medications; however, the patient declined pharmacologic therapy due to concerns regarding potential adverse effects. She subsequently visited a pharmacy and initiated Ortho-Cellular Nutrition Therapy (OCNT). Considering her concerns about medication-related adverse effects and her underlying hypothyroidism, OCNT was selected as an intervention aimed at improving osteoporosis while minimizing treatment burden.

Fig. 1. Changes in bone mineral density (BMD, g/cm²) before and after OCNT An increase in bone mineral density of both hips was observed in the patient.



Calmaplex granules, Diverol F capsules, and Aqua SAC Pure prescribed to the patient contained calcium and vitamin D. Previous studies have reported that calcium and vitamin D exert beneficial effects on the improvement of osteoporosis and the maintenance of bone mineral density. A meta-analysis evaluating the effects of combined calcium and vitamin D supplementation on osteoporosis in postmenopausal women demonstrated that such supplementation increased bone mineral density in the pelvic region and improved serum 25-hydroxyvitamin D levels.[5] Accordingly, in this case, these nutrients were prescribed with the aim of contributing to the improvement of osteoporosis.

Collaplex granules prescribed to the patient contained collagen. Recent studies involving postmenopausal women have reported that supplementation with collagen peptides, followed by a four-year follow-up period, resulted in a significant increase in bone mineral density at the spine, with consistent increases also observed at the femoral neck. These findings suggest that long-term collagen peptide supplementation may exert a beneficial effect in attenuating bone mineral density loss.[6] Accordingly, in this case, collagen was prescribed with the aim of improving bone mineral density reduction associated with osteoporosis.

In addition, Collaplex granules contained vitamin C to support collagen synthesis. Vitamin C is commonly recognized as a nutrient associated with scurvy; however, it is essential for collagen synthesis within the bone matrix and plays an important role in maintaining bone metabolism through its antioxidant activity, which eliminates reactive oxygen species detrimental to bone health. A clinical study reported that

vitamin C may influence osteoblast and osteoclast formation, and supplementation in vitamin C–deficient animal models was shown to prevent bone loss.[7] Accordingly, in this case, vitamin C was prescribed to support collagen synthesis within the bone matrix and to contribute to overall improvement in bone health.

The patient in this case experienced osteoporosis associated with occupational factors and hormonal changes related to menopause and reported related discomfort. Following approximately one year of Ortho-Cellular Nutrition Therapy (OCNT), the patient's femoral bone mineral density and T-scores increased to within the normal range. Although this case represents an intervention applied to a single patient and therefore has limitations in generalizability to all patients with osteoporosis, a significant increase in bone mineral density was observed following personalized nutritional intervention. These findings suggest a positive effect on the improvement of osteoporosis, and this case is therefore reported.

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