

**Short Review**

## A Short Review Based on the Article Entitled Subcutaneous Testosterone Pellet Therapy for Reversal of Male Osteoporosis: A Review and Case Report

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This article describes the effects of consistent levels of testosterone in a pellet form and its potential to reverse osteoporosis. It is a descriptive case report of a 54-year-old male with a spontaneous fracture and osteoporosis in the presence of what many societies consider a normal male testosterone level. After discovering and documenting osteoporosis by DXA scan, the patient was shown to reverse the diagnosis of osteoporosis in a year on pelleted testosterone therapy. Consistent levels of 943 were achieved, the patient also experienced improvements in quality of life and sleep apnea.

To summarize, testosterone deficiency is a clinical syndrome and osteoporosis can be found in levels above standard “criteria” of 300. Our patient did not realize a benefit on injections both physical and clinically previously, however, both improved on pelleted testosterone. Thus, pelleted testosterone therapy should be further studied and considered for testosterone deficiency in men.

### Overview of Research Background and Purpose

Each year, more than 8 million men are diagnosed with osteoporosis or osteopenia [1]. Men with osteoporosis are treated with lifestyle modifications, drug therapy, and hormonal therapy if they have been diagnosed with Testosterone Deficiency (TD). However, normal testosterone ranges remain a somewhat controversial area. Integrity of our skeletal system is maintained by a remodeling process, which is regulated by three bone cell types: bone-forming osteoblasts,

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bone-resorbing osteoclasts, and mechanically sensitive osteocytes. These are under regulation by many processes, which involve testosterone and androgen receptors as well as the effect of estrogen receptors that are known to be influenced by testosterone levels. Osteoporosis risk for men suffering from fractures carry a greater mortality risk over women [2,3]. Administrative therapy also plays a key role. Problems in both obtaining levels and then maintaining compliance are critical in the process and clinical outcome [4].

We describe a case of an osteoporotic patient with what many clinicians would consider a normal testosterone level who was successfully treated with subcutaneous testosterone (pellet) achieving higher sustained and consistent levels, resulting in almost complete recovery of osteoporosis after one year of treatment.

### Research Summary and Outlook

The described case is that of a 54-year-old male triathlete who had a non-fall-related tibial plateau fracture on 12/1/2018 while stepping out of his ski boot, after a normal day of snow skiing. Except for a back injury in a Motor Vehicle Accident (MVA), his medical history was non-contributory. Surgical history included two previous wrist fractures sustained while mountain biking and a left meniscus arthroscopy to repair a meniscal tear. He had received intramuscular testosterone supplementation in his early 40's to improve his overall performance. He was on this for a year and then stopped after consulting with a physician who expressed concern about his elevated blood count.

Following his tibial fracture, the patient saw an orthopedic surgeon and had casting and bracing for his left tibia for 3 months. He then underwent DEXA scan on 1/3/2019 with his results showing osteoporosis in the spine and femoral neck as follows: Spine T -2.6, Z-2.1 osteoporosis, Total hip -1.8 Z-1.4 osteopenia, Femoral neck T -2.7, Z-1.8 osteoporosis.

The patient was offered traditional hormonal treatment by his primary care physician, but he declined treatment. Patient sought counseling on 3/19/2019 due to his interest in addressing his osteoporosis with hormonal treatment. His initial Testosterone (T) was 473 ng/dL, vitamin D was 39 ng/mL, Prostate-Specific Antigen (PSA) .4 ng/mL, estradiol 14 ng/dL, HgA1c 4.9%, and his BMI was 26.3.

After counseling the patient about the pros and cons of testosterone therapy, we initiated testosterone pelleting therapy. He was also started on 10,000 IU/day of a vitamin d3k2 nutraceutical formulation and DIM (Diindoyl methane) 300 mg—which is also nutraceutical grade formula known to prevent aromatization. Upon reanalysis, his testosterone level was 943 ng/dL, free testosterone 116 ng/dL, Hematocrit 51%, estradiol 15 ng/dL. The patient was checked regularly every 3-4 months by physical exam and lab workup. After 6 months, his repeat vitamin d level was 52 ng/mL and his estradiol was 29 ng/dL. He continued testosterone therapy, and at the year interval, a repeat DEXA scan was obtained on 3/4/2020. His results showed: Spine T -2.2/-1.6 6% increase—osteopenia, Total hip T-1.5/.8 6.8% increase—normal, and femoral neck T-2.4/-1.5 7.2% increase—osteopenia.

The patient, at one year of hormone therapy, improved his composite bone density substantially, normalizing his total hip bone density and improving his quality of life and returned to performing triathlons in one year. His physical symptoms improved and he found it easier to maintain his therapy with the pellet administration with low documented complication rates [5].

This case report noted pelleted isomolecular (bio-identical) testosterone replacement using an FDA regulated 503b compounded pharmacy resulted in significant improvement of bone density. This effect was related to the significant elevation of what many would consider a normal testosterone level. This patient was able to strengthen bone, remove supportive fracture hardware in one year and had increased energy, recovery, and benefits to his sleep apnea without the significant side effects of standard etidronate therapy.

This case report raises the questions of whether it is safer and more efficacious to administer high range testosterone doses in men suffering from issues related to loss of bone density and should the chosen delivery in such situations is subcutaneous pellet vs transdermal or intramuscular administration. There is a tremendous need for more data that could address these questions, most notably a prospective randomized trial.

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