

# The successful use of Denosumab to treat osteoporosis in a patient with severe Anorexia Nervosa

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## Background

Women with persistent Anorexia Nervosa are highly likely to develop osteoporosis and fractures (1).

The presence of low bone mineral density in a young woman with low body weight raises a challenging circumstance that can often provoke great anxiety for clinicians involved in the care of these patients. The best single treatment for low bone density for these patients is weight gain and its maintenance at a normal body mass index but this can prove problematic in practice.

## Case Description

A 29 year old female with a 17 year history of severe enduring anorexia nervosa attended our unit. Osteoporosis was diagnosed aged 24 and she had developed a left calcaneal fracture after minimal trauma 3 weeks prior to presentation (Figure 1). She had been amenorrhoeic continuously for 14 years. Her bone mineral density at this time confirmed the presence of osteoporosis at the lumbar spine and total hip (T-score -3.3 and -2.9 respectively) and her body mass index was low at 15.1 kg/m<sup>2</sup>. She declined therapy previously with oestrogen and bisphosphonate therapy and was not keen to undertake daily injections of teriparatide.

A decision was made to commence therapy with Denosumab 60mg by subcutaneous injection every six months with monitoring of serum calcium and co-administration of calcium and vitamin D. A further measurement of bone mineral density was made 2 months after completing three years of therapy with Denosumab. During the period of treatment the patient did not experience any adverse effects related to the treatment. There was no evidence of hypocalcaemia nor were there further fractures. The patient's BMI remained at 15.2 + 0.3.

Bone mineral density increased substantially at the lumbar spine (14.8% increase from pre-treatment) and at the left total hip site (1.4% increase from pre-treatment). The measurement at the left femoral neck showed a reduction of -5.7% from its pre-treatment value (Figure 2).

## Discussion

Denosumab is a human monoclonal antibody that binds with high specificity to the receptor activator of nuclear factor- $\kappa$ B ligand (RANKL) and results in decreased bone resorption, decreased bone turnover and reduces vertebral and non-vertebral fractures in postmenopausal women and can be safely administered for at least six years (4,5). The magnitude of the change in bone mineral density seen in post menopausal women treated with Denosumab is similar to that observed in this case despite the patient's ongoing low weight and suggests that this agent may be a useful therapy for treating osteoporosis in patients with anorexia nervosa and merits further investigation in the appropriate trial setting.

Following three years of successful event free treatment, the patient has opted to undertake a further and final three years of Denosumab therapy with ongoing monitoring for adverse effects.



Figure 1

Plain Radiography of right calcaneum showing undisplaced fracture in June 2012. The patient experienced pain following repeated walking.

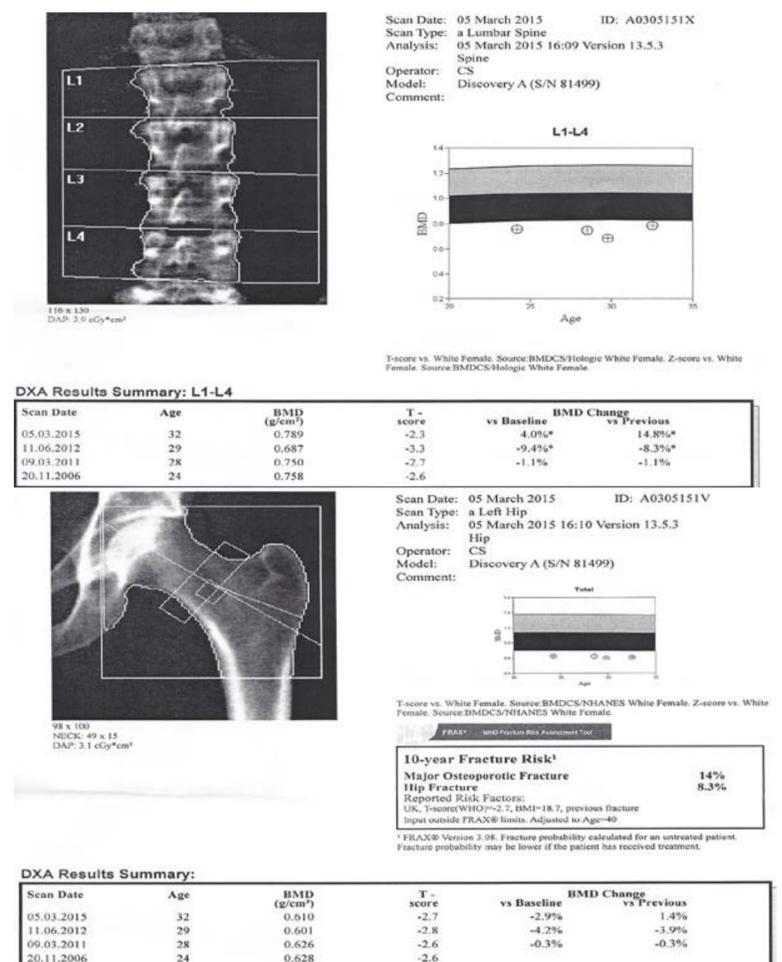


Figure 2

DXA results showing response to treatment with Denosumab at Lumbar spine and total hip.

### References

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