

First use of bioactivated silicon-vitamin D₃-vitamin K₂ combination: effects on pain and bone marrow edema

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Abstract

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Abstract

Introduction. Bone marrow edema (BME) is a descriptive term for a common finding in magnetic resonance imaging (MRI). Lumbar pedicle stress reactions are conditions that affect the bones of the lumbar spine and refers to a state where these bony structures undergo microscopic damage. This can result from various factors, including: repetitive strain, overuse, abnormal spinal mechanics, and bone health issues. Diagnosis involves a combination of clinical evaluation, medical history assessment, and imaging techniques (X-rays, CT or MRI scans).

BME usually resolves spontaneously within 3–9 months². However, there are several treatment strategies, which can be conservative or surgical, that aim to reduce pain symptoms: NSAIDs and steroids reduce bone edema and inflammation; vitamin D, iloprost, bisphosphonates, teriparatide are indicated¹ given the increased bone resorption and remodeling.

Stabilization of the bone architecture may be achieved with the combination of bioactivated silicon-vitamin D₃-vitamin K₂. The effects of vitamin D₃ in supporting bone metabolism are well known, while vitamin K₂ is an essential cofactor of vitamin D₃ allowing the transformation of pro-osteocalcin into osteocalcin. Studies carried out in vitro and in vivo³ show that silicon is involved in the process of bone turnover: it modulates the activity of prolyl-hydroxylase, an enzyme essential for collagen synthesis, thus stimulating the production of type I collagen.

Methods. To evaluate the efficacy of bioactivated silicon-vitamin D₃-vitamin K₂ in a case of stress induced vertebral pedicle edema, we present the case of a 56-year-old male who complained of the onset of low back pain over the previous six months without a history of trauma. The patient underwent a low back MRI, which showed L3 left pedicle edema and L3-L4 zygapophyseal joints inflammation. Initially, he was treated with clodronate and vitamin D₃. He referred to our outpatient facility for the persistence of pain. A follow-up MRI showed an unchanged picture six months after the initial treatment, blood tests excluded the presence of infection and systemic inflammation. He was subsequently treated with L3-L4 left intra-articular ultrasound-guided steroid injections. Bone edema was treated with bioactivated silicon-vitamin D₃-vitamin K₂ (Sildi®) for two months at dosage of 60 mg-2400 UI-90 mcg per day.

Results. Two months after the treatment, the patient reports a 40% reduction in low back pain and a 60% improvement in the Oswestry scale. A follow-up low back MRI showed a consistent reduction of pedicle edema. No side effects were reported.

Conclusions. There are many papers in the literature demonstrating the efficacy of drugs acting on bone metabolism but interdisciplinary, evidence-based guidelines for the diagnosis and management of BME are lacking. To the best of our knowledge, this is the first report on the successful use of the combination of bioactivated silicon-vitamin D₃-vitamin K₂ for bone healing in vertebral bone stress edema.

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