



Osteoporosis Up-Date for Orthopedic Surgeons

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Commentary

Osteoporosis is a special concern to the orthopedic surgeons who deal with musculo-skeletal problems, particularly when they are fixing fractures. The World Health Organization estimated that 75 million people in Europe, America and Japan were affected with osteoporosis [1,2] and many fractures were related to osteoporosis. The general fear about fractures and the concern among the medical professionals thus have greatly helped putting “osteoporosis” into the Disease Category.

Is Osteoporosis a Disease?

Facts already known to the orthopedic surgeon

Osteoporosis is a physiological process of degradation of bone structure mainly related to aging: With few exceptions, Osteoporosis is not a disease, although many fractures have co-existing osteoporosis. Osteoporosis itself does not cause fracture although it could be one of the causes related to fractures. Without a fall, or an accident, fracture does not happen spontaneously. And there are so many other factors leading to a fall: musculo-skeletal weakness, loss of balance, drug effects, poor vision, slippery ground etc.

Osteoporosis complicates Surgical Treatment: The fragmentations and comminutions often accompanying long bone fractures in patients suffering from osteoporosis could be serious obstacles to operative fixation and immobilization. Special devices and implants might be necessary [3]. Special techniques like the use of bone cement to help holding the reduction of fracture ends could often be required [4]. When fractures happen in the vertebral bodies of an aging degenerative spine, surgical decision could be very difficult. Over-energetic surgical maneuvers could be disastrous or fail to match expectations [5].

Post-surgery Management for Patients with Osteoporosis: The rehabilitation planning for osteoporotic patients needs to be much more conservative than usual [6]. When the fracture is classified as “Fragility Fracture”: meaning fracture initiated by a minor fall or twist in a fragile bone because of osteoporotic weak structure, specific pharmaceutical intervention should be considered [7]. The purpose of pharmaceutical intervention is to maintain the structural state of the bone and prevention of further deterioration rather than correcting the low bone mineral density [7]. A fragile bone has suffered from many years of structural deterioration for varieties of reasons like nutritional defects, lack of exercises and aging. It would not be realistic to demand a complete restoration. However, pharmaceuticals are available to help maintaining a reasonable structural state.

Facts not yet known to the Orthopedic Surgeon

Over use of anti resorptive agents to counteract osteoporosis could be harmful: Orthopedic surgeons could note a statement made in the American Society of Bone Mineral Research Task Force Report: “Decision on long-term bisphosphonates treatment should be individualized. It may be beneficial for some women, particularly those at high vertebral fracture risks” [8]. Bone density is a reflection on the physiological state of bone metabolism which depends on a balance between bone formation and bone resorption. Over suppression on the resorption side might lead to excessive rigidity in some areas of cortical bone resulting in “Odd fractures” and sometimes jaw necrosis. The current concept of counter osteoporosis intervention should therefore be DEXA guided intermittent yearly considerations [9].

What is the best choice for the management of acute compression fracture of vertebral bodies?: Acute vertebral fractures resulting from osteoporotic bone classically present with severe disabling pain, followed by marked decline in the quality of life. The miserable patient and energetic surgeon tend to opt for rapid relief i.e. operative choice of vertebral augmentation, vertebroplasty or kyphoplasty. The former is much simpler and less invasive, hence has gained preferences. After twenty years of such active interventions, it is time to objectively assess its merits and justifications. The

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INVEST patient-reported outcome trial conducted at the University of Washington since 2007 and reported in 2013 is the only most thorough investigation comparing vertebroplasty and conservative treatment. Unfortunately, the report stated “Vertebroplasty may provide a modest reduction in pain at 1 year, compared with the control procedure; and no difference in functional disability was observed”. The discouraging remark might not discourage miserable patients and energetic surgeons. However, it should have reminded the surgeon on individualized considerations [10].

Do Nutritional Supplements Help?: Vitamin D supplementation is widely prescribed as it is contained as part of the clinical guidelines for osteoporosis management and fracture prevention. However, recent meta-analyses of randomized controlled clinical trials failed to confirm any benefit of vitamin D and calcium supplementation in patients without pronounced deficiency of these factors. These findings highlight the need to re-assess its wide-spread use in clinical practice. Procuring a healthy lifestyle with a balanced diet and remaining physically fit remain the main pillars of a sustainable bone health [11].

Does specific Genomic predisposition influence the outcome of Osteoporosis?: A large international collaboration has tracked down 15 variations in the genome that are related to the risk of suffering osteoporotic fractures. The collaboration went a step further and used genomic information on other risk factors to examine their causal role on developing fractures. Results showed that only bone mineral density and muscle strength are directly involved in fracture susceptibility. Genetic predisposition to other clinical risk factors like vitamin D levels and calcium intake, historically considered to be crucial mediators of fracture, were not found to be directly predisposing fracture [11].

Conclusion

Orthopaedic Surgeons of today could comfortably conclude that increasing muscle and bone strength through the maintenance of a healthy life style with balanced diet and plenty of physical training remain the most important practice in the prevention of Osteoporosis, and even when early signs of deterioration (i.e.Osteopenia) are evident.

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