INTRODUCTION

Lumbar spinal osteoporosis

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THIS *Neurosurgical Focus* issue topic is lumbar spinal osteoporosis and is a combined effort between the JNS Publishing Group and the Lumbar Spine Research Society (LSRS). Osteoporosis is a common but underappreciated and undertreated chronic disease that is being more frequently recognized as an important predictor of poor outcomes and complications of spinal surgery.

Surgeons have little training in the clinical care of metabolic bone disease; therefore, until recently, they have viewed conditions such as osteoporosis as a chronic disease to be managed by primary care physicians. However, observational studies over the last 2 decades have consistently demonstrated that the diagnosis of osteoporosis is often missed, even after fragility fracture, leaving many patients at risk for further fracture or complications following elective spine surgery. Dual-energy x-ray absorptiometry (DXA) is currently considered part of the gold-standard imaging modality for assessing bone quality. Accumulating data are showing better correlation of bone strength/quality to quantitative CT- and, more recently, MRI-derived values. These imaging modalities, commonly performed preoperatively, may prove equivalent, if not superior, to DXA as a means of assessing bone quality. Additional investigation should be focused on the ability of these imaging modalities to predict postoperative osteoporosis-related complications.

The evidence reported in this issue confirms that poor bone quality is associated with cage subsidence (Xi et al. and Pisano et al.), proximal junctional kyphosis (Duan et al.), pedicle screw loosening (Xu et al.), and pseudarthrosis and revision surgery (Khalid et al.). All of these authors used lumbar Hounsfield units determined from opportunistic CT to estimate bone quality.

Bone health optimization (BHO) is the systematic approach to screening and optimizing bone quality prior to elective surgery. Anderson et al. demonstrated in the con-

struct of a BHO initiative that spine surgical teams can identify patients with osteoporosis and initiate treatment before surgery by using accepted guidelines. Flanigan et al. and Khalid et al. found that treatment with teriparatide, an anabolic medication, demonstrated improvement in outcomes. Perioperative bisphosphonate (antiresorptive medications) use had been controversial in spine fusion patients given concerns that such medications may interfere with spinal fusion (based largely on animal studies); however, a large review by Guppy et al. showed that their use did not influence lumbar fusion. Other strategies to manage osteoporosis, such as the use of methylmethacrylate-augmented pedicle screws and the timing of cement augmentation, were reviewed.

Finally, it is universally agreed that patients having fragility fractures of the hip and spine should have secondary fracture prevention, although less than 20% of patients receive such care. The LSRS was again happy to help produce a high-quality *Neurosurgical Focus* issue that should encourage spine surgeons to consider bone health in all patients.

<https://thejns.org/doi/abs/10.3171/2020.5.FOCUS20412>

Disclosures

Dr. Anderson is a consultant for Amgen, Radius Medical, and Medtronic; holds direct stock in Titan Spine; and receives royalties from Regeneration Technologies. Dr. Chou is a consultant for and receives royalties from Globus. Dr. Witham has direct stock ownership in and is a consultant for Augmedics; has direct stock ownership in Additive Orthopaedics LLC; and receives support from The Gordon and Marilyn Macklin Foundation for clinical or research effort overseen by him.

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