Clinical: Prosthesis

Bone Mineral Density Scanning in Potential Lumbar Total Disc Replacement Patients

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Introduction: Bone quality has always been an important consideration for spinal instrumentation, particularly with respect to pedicle screw pullout. With the increasing use of motion preserving technologies, rather than fusion, bone density is of greater concern as vertebral body fracture is a potentially devastating complication. The purpose of this study was to describe our experience with bone mineral density (BMD) assessment in potential total disc replacement (TDR) patients.

Methods: A group of 54 patients who were considered TDR patients (either for TDR only or as part of a hybrid TDR/fusion procedure) at a single clinic during an 18 month period underwent BMD assessment. The patients included 21 males and 33 females with a mean age of 44.2 years, ranging from 28 to 62 years. Then mean body mass index (BMI) was 26.6 ranging from 18.3 to 35.3. Patients with osteoporosis or osteopenia, defined by the World Health Organization as a dual energy x-ray absorptiometry (DEXA) T-score value of less than -1.0, are not considered candidates for lumbar TDR.

Results: Among the 54 patients, three (5.5%) who were considered candidates for TDR had T-scores of less than -1.0. Due to their low BMD values, they instead underwent fusion. All three patients were male with ages of 39, 49, and 56 years. Their BMI values ranged from 24.4 to 30.7.

Conclusion: In this group of patients, the surgical plan was changed from TDR to fusion based on DEXA values in 5.5% of patients. Of note, the low DEXA scores were in males with BMI scores in the range of high-end of normal to obese - not the stereotypical osteoporotic/osteopenic patient. The percentage of patients in this study with low BMD values may be biased as not all patients considered for TDR were scanned. However, surgeons in our practice have increased use of DEXA scanning for surgical screening. It is easily performed and is inexpensive. It is hoped that the results of this study will increase awareness of the importance of DEXA scanning in spine surgery candidates.