

Asymmetric lower-limb bone loss after spinal cord injury: Case report

Abstract

Osteoporosis is a significant secondary condition that occurs acutely after spinal cord injury (SCI). This article reports on a patient with motor incomplete SCI and asymmetric lower-limb bone loss as it correlates with lower-limb motor function and gait characteristics. A 32-year-old Caucasian male completed a comprehensive inpatient rehabilitation program, including 3 months of robotic body-weight-supported treadmill training three times a week. Bone mineral density (BMD) was monitored up to 1.5 years post-SCI by dual-energy X-ray absorptiometry. Ground reaction forces were measured through an instrumented treadmill for bilateral weight-bearing comparison. At 1.5 years post injury, neurological examination revealed thoracic 4 American Spinal Injury Association Impairment Scale D SCI with less strength, reduced weight bearing, and lower BMD in the more neurologically impaired leg. These results suggest that osteoporosis may vary according to severity of impairment within individuals and that monitoring lower-limb BMD is especially important for patients who ambulate.

Key words: bone density, DXA, ground reaction forces, lower limb motor function, osteoporosis, paraplegia, rehabilitation, robotic-assisted body-weight-supported treadmill training, spinal cord injury, tetraplegia.