

Suggestion of Two-Step Traction Therapy for Safer and More Effective Conservative Treatment for Low Back Pain

Authors : Won Man Park, Dae Kyung Choi, Kyungsoo Kim, Yoon Hyuk Kim

Abstract : Traction therapy has been used in the treatment of spinal pain for decades. However, a case study reported the occurrence of large disc protrusion during motorized traction therapy. In this study, we hypothesized that additional local decompression with a global axial traction could be helpful for risk reduction of intervertebral disc damage. A validated three dimensional finite element model of the lumbar spine was used. Two-step traction therapy using the axial global traction (the first step) with 1/3 body weight and the additional local decompression (the second step) with 7 mm translation of L4 spinal bone was determined for the traction therapy. During two-step traction therapy, the sacrum was constrained in all translational directions. Reduced lordosis angle by the global axial traction recovered with the additional local decompression. Stress on fibers of the annulus fibrosus by the axial global traction decreased with the local decompression by 17%~96% in the posterior region of intervertebral disc. Stresses on ligaments except anterior longitudinal ligaments in all motion segments decreased till 4.9 mm~5.6 mm translation of L4 spinal bone. The results of this study showed that the additional local decompression is very useful for reducing risk of damage in the intervertebral disc and ligaments caused by the global axial traction force. Moreover, the local decompression could be used to enhance reduction of intradiscal pressure.

Keywords : lumbar spine, traction-therapy, biomechanics, finite element analysis

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020