Post-laminectomy spine strength can be predicted

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Following lumbar laminectomy, loss of strength and shear stiffness can be predicted in the human lumbar spinal segment using measurable parameters, according to a study published in the December issue of the *European Spine Journal*.

(HealthDay)—Following lumbar laminectomy, loss of strength and shear stiffness (SS) can be predicted in the human lumbar spinal segment using measurable parameters, according to a study published in the December issue of the *European Spine Journal*.

Arno Bisschop, from the VU University Medical Center in Amsterdam, and colleagues classified geometry and degeneration of the motion segments in the lumbar spine of patients undergoing facet sparing lumbar laminectomy based on radiographs and magnetic resonance imaging. Dual X-ray absorptiometry scans were used to measure bone mineral content and density (BMC and BMD). L2 to L3 and L4 to L5 spinal motion segments were dissected and tested in shear.

The researchers found that, following laminectomy, shear stiffness (SS) decreased by 24 percent, shear yield force (SYF) decreased by 41 percent, and shear force to failure (SFF) declined by 44 percent. SS was significantly associated with intervertebral disc degeneration and facet joint degeneration for segments with laminectomy. Intervertebral disc geometry, BMC, and frontal area were correlated with SYF, and disc length and BMC were linked to SFF. In untreated segments, significant correlations were noted for SS and facet joint tropism; SYF and pedicle geometry; and for SFF with BMC, BMD, and frontal area. For segments with and without laminectomy, SS, SYF, and SFF could be predicted.

"Significant loss of strength and SS are predicted by BMC, BMD, intervertebral disc geometry and degenerative parameters, suggesting that low BMC or BMD, small intervertebral discs and absence of osteophytes could predict the possible development of postoperative instability following lumbar laminectomy," the authors write.

More information: Abstract
Full Text

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