

Simulate Upright Position in CT and MRI

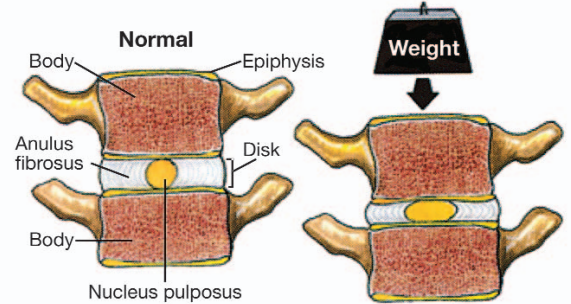


Axial Loading during MR Imaging Can Influence Treatment Decision for Symptomatic Spinal Stenosis

Akio Hiwatashi, Barbro Danielson, Toshio Moritani, Robert S. Bakos,
Thomas G. Rodenhouse, Webster H. Pilcher, and Per-Lennart Westesson

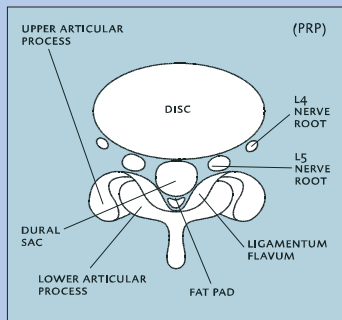
American Journal of Neuroradiology 25:170-174, February 2004

Function of Intervertebral Disks

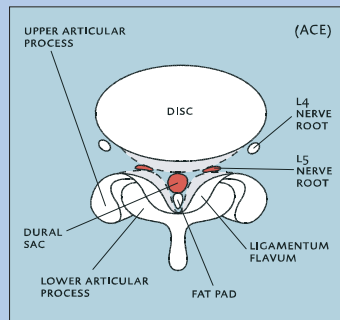


The disk, with its contained gelatinous nucleus pulposus, function as a cushion

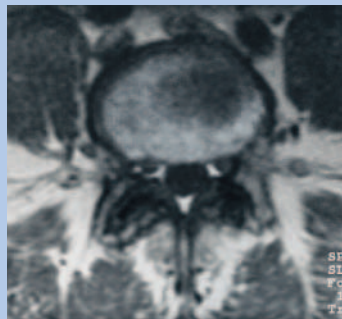
Lumbar Axial (Top View)



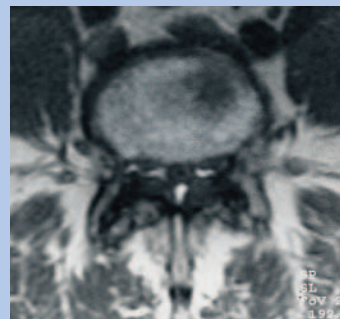
Without Load



With Load



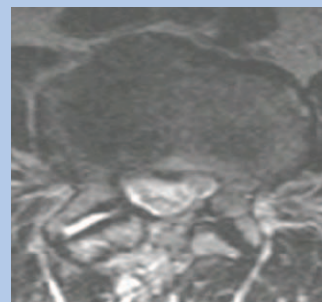
Relative Stenosis
Central Spinal Stenosis
Dural Sac Area = 90 mm²
(Non Surgical)



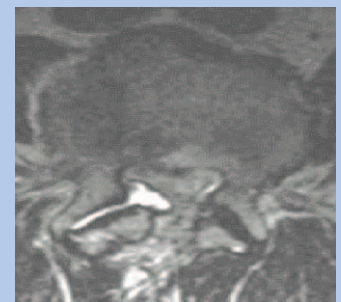
Absolute Stenosis
Central Spinal Stenosis
Dural Sac Area = 60 mm²
(Surgical)

Synovial Cyst (Example)

Patient: Male, 76 years. **History:** 2 years severe sciatica, impaired walking and standing capacity



Without Load
Synovial Cyst - **Not Seen**



With Load
Synovial Cyst - **Seen**

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Axial Loading during MR Imaging Can Influence Treatment Decision for Symptomatic Spinal Stenosis

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BACKGROUND AND PURPOSE: Previous studies have shown that axial loading can narrow the spinal canal. However, the clinical significance is unclear. The purpose of this study was to determine whether the narrowing of the spinal canal with axial loading during MR imaging could influence treatment decision for spinal stenosis.

METHODS: Two hundred patients with clinical symptoms of spinal stenosis underwent routine MR imaging and then immediately underwent axially loaded MR imaging. We selected 20 of these patients because they had narrowing of the spinal canal shown on the axially loaded images. Three experienced neurosurgeons evaluated these 20 patients based on clinical information and routine MR images. The same neurosurgeons were then asked for second treatment decisions based on the same clinical information but with axially loaded MR images.

RESULTS: Axial loading during MR imaging of the lumbar spine can influence neurosurgeons in their treatment decisions for symptomatic spinal stenosis. For this selected group of patients, all three neurosurgeons changed their treatment decision from conservative management to decompressive surgery for five patients when shown the axially loaded MR images. For two other patients, two neurosurgeons changed their treatment decisions, and for three additional patients, one neurosurgeon changed his treatment decision, all based on the axially loaded MR images. Treatment was not changed from surgical to medical management for any of the patients when shown the axially loaded images.

CONCLUSION: In selected patients with spinal stenosis and apparent narrowing of the spinal canal shown by axially loaded MR imaging, the additional information gained from this technique can influence experienced neurosurgeons in their treatment decisions.